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NBAA MANAGEMENT GUIDE

INTRODUCTION

The *NBAA Management Guide* is an industry how-to manual for business aviation management. Recognized as one of NBAA's most popular Member benefits, this publication assists flight departments with operational, maintenance, administrative and other considerations.

It should be noted that this is not a complete guide for all functions of the flight department; consequently, it does not cover every possible situation faced by business aviation managers. However, the *NBAA Management Guide* does attempt to summarize essential information concerning the operation of a flight department.

Much of the information contained in this guide may be used as reference material to educate non-aviation company personnel on accepted practices and norms of the business aviation community. One of the essential functions of flight department personnel is to ensure that all company personnel appreciate and understand the operation, capabilities and value of the flight department.

NBAA periodically issues content updates for this publication, so please store your guide with your operations references, so that you can easily replace pages when future editions are issued. You can always find the latest version of the *NBAA Management Guide* online at www.nbaa.org/management-guide.

The Association welcomes your feedback and questions on this publication. Send your comments to NBAA's Operations Service Group at (202) 783-9250 or info@nbaa.org.

As an NBAA Member, you have access to unparalleled benefits and resources. Visit the Membership Information section of this publication for an overview of the benefits available to you, along with tips on taking advantage of them.

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REVISION RECORD

Spring 2011

The *NBAA Management Guide* is an evolving document. In coordination with its Standing Committees, the Association periodically issues content revisions for this publication as new information becomes available.

EXPLANATION OF CHANGES

This edition of the *NBAA Management Guide* was re-released in Spring 2011 and supercedes the previous edition released in Fall 2010. Please retain this sheet behind the "Revision Record" tab in your binder for your reference.

The Spring 2011 revision introduces the following changes to the content of the *NBAA Management Guide*.

- Update to Section 1.4: Safety Management Systems. Change to opening paragraph.
- Updates to Section 1.6: Aviation Department Personnel. Change to opening paragraph. Revision of bullet in Captain subsection.
- Update to Section 1.20, Career Development Training. Two subsections were modified: NBAA Certified Aviation Manager Program and NBAA Annual Meeting & Convention. One new subsection was added: NBAA On-Demand Education.
- Update to Section 1.22: Security. Addition of new bullet to Plans to Avoid Breach of Security subsection.
- Update to Section 1.27: Aircraft Resourcing Options. Revision of bullet in Corporate Air Shuttle Considerations subsection.
- Reordering and subsequent renumbering of sections starting with Section 1.35: Non-Business Use of Employer-Provided Aircraft (formerly Outsourcing).
- Introduction of new Section 1.37: State Aviation Taxes.
- Updates to Section 1.40: References for Administration (previously 1.39).
- Updates to Section 2.2, Crew Training. Two subsections were modified: Minimum Regulatory Standards and Advance Crew Training. New subsection added titled Upset Recovery Training.
- Updates to Section 2.5: Transient Facilities and Services, including addition of new subsection titled Airport Access After FBO Hours.
- Updates to Section 2.8: Standard Operating Procedures, including addition of new subsections titled Pre-Taxi/Departure Briefing; Visual Meteorological Conditions Approach and Landing; Operations at Night; and Events Requiring Notification to the NTSB.
- Updates to Section 2.16: References for Flight Operations.
- Update to Section 3.8: MNPS Airspace and RNP.
- Replacement of Appendix C, newly titled Supplemental Lift (formerly titled Regulatory Responsibilities and Safety Guidelines for Fractional Aircraft Owners and Fractional Aircraft Program Managers).
- Updates to Glossary. Several entries revised or added as indicated by margin lines.
- Updates to Membership section. Changes were applied throughout the section to reflect the latest NBAA Member benefits and events information as of May 2011.

Note: In Sections 1, 2 and 3 and in the Glossary, margin lines are provided to help readers identify revised areas. Margin lines are not provided in Appendix C, which was completely replaced.

FOR MORE INFORMATION

For more information about business aviation management issues, visit the NBAA web site at www.nbaa.org.

This NBAA publication is available in either print or PDF formats upon request, and only NBAA Members are eligible to receive copies. For more information, to order printed copies or to download PDF copies, visit the NBAA web site at www.nbaa.org/management-guide.

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1. ADMINISTRATION

1.1. Purpose of the Aviation Department

The purpose of the corporate aviation department is to provide safe, efficient and convenient air transportation to assist in achieving the mission and goals of the company. The aircraft is the strategic tool used in fulfilling that role.

The corporate aviation department should be viewed as an integral and strategic element of the corporate structure, regardless of the company's primary functions. A manufacturing firm depends heavily upon its production facilities and personnel, but would not be able to function without its administration, sales, research and other essential departments. In the same manner, the aviation department provides a variety of transportation and communication functions, which, once instituted, become indispensable to the company's operations.

An aircraft is a valuable corporate asset. Its tangible benefits include personnel time savings, enhanced productivity, improved operational flexibility, product marketing, and carriage of critical material. Many intangible benefits are derived from the use of corporate aircraft, such as enhanced potential for entrepreneurship, increased community service capability and improved corporate stature.

Those unfamiliar with the transportation needs of modern business may have a negative impression of corporate aircraft. This perception is changing, however, as aviation departments continue to promote corporate aviation successfully – to people both inside and outside of the company – as an essential, strategic corporate function.

Unfortunately, negative perceptions of corporate aviation persist and are shared by many corporate managers and decision-makers who lack firsthand knowledge of corporate aviation. This will not change unless aviation department personnel actively promote the concept of corporate aviation as essential so that its value will be recognized. Various NBAA publications provide plenty of information that can be used to justify the corporate aviation function.

In addition, the NBAA web site at www.nbaa.org is a valuable resource, and the NBAA-produced TravelSense software program is a useful aid to quantifying and justifying the aviation department's contribution to the company's overall success.

An aviation department may remain relatively hidden from the rest of the company and its personnel. This is because it is located off-site, at the airport, and aviation personnel only may interact with a few of the company's top corporate managers and their assistants. It is therefore vital for the aviation department to integrate completely into the company so that other departments are fully aware of the aviation department's activities and contributions.

In addition to isolation caused by their physical separation from the rest of the company, aviation department personnel tend to be naturally isolated because they possess a highly specific professional expertise that is not usually related to that of mainstream company personnel. This is unfortunate, because the company's administration, human resources, finance, legal, procurement, facilities and personnel training departments can be of great value to the health, well-being and prominence of the aviation department. Unless the support and counsel of other departments is sought actively, the aviation department will remain isolated and vulnerable to attack by those who believe it is a nonessential function.

It is incumbent upon the aviation department to help company management realize the worth and full potential of the aviation department's service. To achieve this goal, the aviation department must understand the needs of the company, and the only way for the aviation department to do this is to ask the customer – the user of the aircraft. The aviation department cannot define its own role; this information has to come from aircraft users.

Aviation department managers in particular, and all aviation department personnel in general, must pay close attention to the many non-aviation duties associated with operating corporate aircraft. The department must take care of administrative items – such as operating records, budgets, personnel reports, training reports and strategic planning – if the department is to remain a viable part of the company.

Perhaps the best way for the aviation department to begin integrating with the rest of the organization is to establish a policy that promotes interaction between the aviation department and the rest of the corporation. Since the aviation department is a service organization, higher levels of service provided will build its reputation as a valued component of the company.

1.2. Flight Operations Manual

A flight operations manual is an essential possession for all corporate aviation departments. In fact, NBAA Corporate Members must certify that they use such a manual even though they may operate under Federal Aviation Regulation (FAR) Part 91, which does not require a manual. The manual's principal function is to provide operational and administrative information to department personnel. The manual also serves as a communication tool that transmits the aviation department's goals, policies and procedures to the entire company.

A properly executed manual serves as a contract between the company's Chief Executive Officer (CEO) and the aviation department. It communicates expectations, limitations and objectives. Once it has the CEO's approval, the manual becomes a corporate directive that protects the aviation department from abuse and provides operational expectations

and rules for the department to follow. Because the manual is used to establish policy, it must be carefully crafted and reviewed at regular, scheduled intervals to ensure that it continues to meet corporate and departmental needs.

Figure 1.1 shows a sample outline for an operations manual. **Figure 1.2** displays a list of requirements for operators certificated under FAR Part 135. Both items are based on information provided in current NBAA workshops designed to help aviation department managers develop new manuals or evaluate and review existing manuals. It should be noted that an operator certificated under FAR Part 135 also must comply with applicable regulations embodied in FAR Part 119, which should be reflected in the operator's manual.

Since each aviation department operates with different philosophies and values, most of the manual's contents are unique to each department. While some policies and procedures may be common to a wide range of aviation operators, efforts should be made to customize the manual to each aviation department's operations.

Once the manual is drafted, the CEO and the person directly responsible for the aviation department should take the time necessary to review and discuss its contents and application in the organization thoroughly. This joint analysis will give aviation department management the opportunity to stress safety requirements and explain the realistic limitations imposed by human capability, the company's aircraft and the operating environment. The CEO's endorsement of the manual contents indicates company approval and sets the criteria for use and operation of the aircraft and department.

Aviation department personnel must understand that the primary purpose of an operations manual is to improve safety and efficiency by standardizing administrative and operational procedures and management philosophy. All personnel should be required to accept and follow the procedures and policies presented in the manual.

The language of the manual should be clear, concise and understandable. This is particularly important when developing crew coordination procedures related to the critical phases of flight (i.e., takeoff, approach, landing and emergencies). The aviation department manager should determine the organization and sequence of the manual contents.

The operations manual is not intended to supersede or replace the FARs or a manufacturer's operating handbook. Some redundancy may be advisable, however, in order to stress operational procedures or regulatory limitations. The appropriate reference to an FAR or a manufacturer's operating handbook should be listed with any policy or procedure that complies with the regulation or recommendation. This will help aviation department personnel understand why a policy or procedure is included.

Completed manuals should be distributed to each aviation department employee. Copies also should be given to the company human resources, legal, administration, scheduling, safety, insurance, and public relations departments, as well as to all individuals who are authorized to approve trips. In addition, a copy should be kept onboard each company aircraft.

It is essential to keep the manual up to date and reflect the actual policies and procedures used by the department. Periodic review and revision of the manual will ensure that this goal is achieved.

1.3. Flying Safety Programs

Managing risk effectively in a modern business aviation flight department requires a proactive, visible and empowered safety program. The single most important prerequisite to the development and maintenance of an effective safety program is management's visible and enduring commitment to fostering a positive safety culture within the organization. Aviation department managers, chief pilots, maintenance managers and all other managers must be aware of and participate in such a program to set the example for others and to constantly monitor the safety performance of the department. Through such leadership, management has the ability to prevent accidents and incidents in a cost-effective manner.

Individual safety programs vary based upon several factors. Among those factors affecting a corporate/ business flight department are type and size of operation, type and complexity of aircraft operated, and geographic area of operation. While each organization's safety program is unique, certain traits should be common to any program. First, the goal of the safety program should be to prevent personal injury and losses resulting from accidents and incidents related to the organization's business.

Second, the structure and staffing of the safety function should be formally recognized within the organization. The safety program should have a written charter and personnel assigned to administer the program. Suggested elements of a flight department's safety program are:

- Management's safety philosophy and policy
- Employee responsibility for safety
- Risk management
- Operational standards in excess of regulatory requirements
- Non-punitive accident/ incident/ hazard identification and reporting
- Accident/incident/hazard investigation (flight and ground)
- Safety audits and compliance checks
- Communication and safety awareness
- Safety education and training

Figure 1.1: Outline With Suggested Topics for an Operations Manual

This section shows a sample outline for an operations manual. Each item in the outline should be considered as far as it applies to flight department operations. Note that an operations manual should provide a method for recording revisions to ensure that the manual and technical publications always are current.

I. Administration

- A. Mission/Objectives
- B. General Policies
 - 1. FAA Enforcement Actions
 - 2. Smoking
 - 3. Alcoholic Beverages/Drugs
 - 4. Medical Fitness
 - 5. Interaction with Media/Press
 - 6. Security
 - 7. Insurance
- C. Organization
- D. Job Descriptions
 - 1. Aviation Department Manager
 - 2. Chief Pilot
 - 3. Captain
 - 4. Copilot
 - 5. Flight Attendant
 - 6. Flight Mechanic
 - 7. Director of Maintenance
 - 8. Technician
 - 9. Aircraft Handler/Cleaner
 - 10. Scheduler
 - 11. Secretary
- E. Personnel
 - 1. Appearance
 - 2. Records
 - 3. Primary and Collateral Duties
 - 4. Use of Part-time Personnel
- F. Pilots
 - 1. Authority of pilot in command
 - 2. Qualifications
 - 3. Training
 - 4. Contract Pilots
 - 5. Pilot Currency
 - 6. Duty Time
 - 7. Physical Fitness
 - 8. Alcohol/Drug Policy
 - 9. Flight Evaluation
- G. Aircraft Maintenance Technician
 - 1. Qualifications
 - 2. Duty Time
 - 3. Training
 - 4. Physical Qualifications
- H. Crisis Planning
 - 1. Organization

II. Operations

- A. Safety
- B. Control of Flights
- C. Scheduling
- D. Basic Operations
 - 1. Dispatch Release
 - 2. Airworthiness
 - 3. Flightcrew Member Duties
 - 4. Flight Plans
 - 5. Operational Reports
 - 6. Maintenance Test Flights
 - 7. Positioning Flights
 - 8. Aircraft Noise Policy
- E. Passenger Relations
 - 1. Policy
 - 2. Crew Duties
 - 3. Authority of pilot in command
 - 4. Schedule Changes
- F. Limitations
 - 1. Airports
 - 2. Weather
 - 3. Aircraft
 - 4. Crew
 - 5. Hazardous Material
- G. Standard Operation Procedures
 - 1. Policy
 - 2. Crew Assignment
 - 3. Basic Crew Responsibilities
 - 4. General
 - 5. (Specific)
- H. Abnormal Operations
 - 1. Emergencies
 - 2. Terrorist Hijacking
 - 3. Accidents/Incidents
- I. International Operations
 - 1. Training
 - 2. Qualification
 - 3. Planning
 - 4. Documentation
 - 5. Security

III. Maintenance

- A. Purpose/Mission
- B. Basic Policies
 - 1. Airworthiness

- 2. Inspection of Work Performed
- 3. Airworthiness Status
 - Documentation
- 4. Controlled Publications
- C. Airworthiness Release
 - 1. Postflight
 - 2. Release Document
- D. Scheduled Inspection and Maintenance
 - 1. Maintenance Programs
 - 2. Work Assignment
- E. Unscheduled Maintenance
 - 1. Discrepancy Reporting
 - 2. Deferred Discrepancies
 - 3. Work Assignment
 - 4. Recording Work Performed
 - 5. Returning Aircraft to Service
- F. Vendor Selection
 - 1. Approval Process
 - 2. Approved Vendors
 - 3. Major Work
 - a. Request for Proposals
 - b. Evaluation of Proposals
- G. Aircraft Maintenance Records
 - 1. Responsibility
 - 2. Record Entries
 - 3. Computerized Tracking System
- H. Aircraft Parts
 - 1. Ordering
 - 2. Receiving
 - 3. Inspection
 - 4. Inventory Control
- I. Aircraft Fueling
- J. Maintenance Test Flights
- K. Checklists
 - 1. Accident/Incident
 - 2. International Operations
 - 3. Flightcrew Evaluation
- L. Forms
 - 1. Manifest
 - 2. Flight Log
 - 3. Abnormal Operations
 - 4. Airworthiness Release
 - 5. Maintenance Discrepancy
 - 6. Deferred Discrepancy
- M. References
 - 1. Advisory Circulars
 - 2. NTSB Part 830
- N. Telephone Numbers
 - 1. Flight Department
 - 2. Company
 - 3. Emergency
 - 4. Government
- 5. Associations**

Figure 1.2: Contents of an Operations Manual if Operations Are Conducted Under Part 135

The following FAR citations and text are provided for NBAA Member Companies that conduct operations under Part 135.23. Member Companies that conduct operations under Part 91 also can use this as a guideline. Each manual shall have the date of the last revision on each revised page.

The manual must include:

- The name of each management person required under §119.69(a) of this chapter who is authorized to act for the certificate holder; the person's assigned area of responsibility; the person's duties, responsibilities and authority; and the name and title of each person authorized to exercise operational control under §135.77
- Procedures for ensuring compliance with aircraft weight and balance limitations and, for multi-engine aircraft, for determining compliance with §135.185
- Copies of the certificate holder's operations specifications or appropriate extracted information, including area of operations authorized, category and class of aircraft authorized, crew complements and types of operations authorized
- Procedures for complying with accident notification requirements
- Procedures for ensuring that the pilot in command knows that required airworthiness inspections have been made and that the aircraft has been approved for return to service in compliance with applicable maintenance requirements
- Procedures for reporting and recording mechanical irregularities that come to the attention of the pilot in command before, during and after completion of a flight

- Procedures to be followed by the pilot in command for determining that mechanical irregularities or defects reported for previous flights have been corrected or that correction has been deferred
- Procedures to be followed by the pilot in command to obtain maintenance, preventive maintenance and servicing of the aircraft at a place where previous arrangements have not been made by the operator, when the pilot is authorized to so act for the operator
- Procedures under §135.179 for the release for, or continuation of, flight if any item of equipment required for the particular type of operation becomes inoperative or unserviceable enroute
- Procedures for refueling aircraft, eliminating fuel contamination, protecting from fire (including electrostatic protection), and supervising and protecting passengers during refueling
- Procedures to be followed by the pilot in command in the briefing under §135.117
- Flight locating procedures, when applicable
- Procedures for ensuring compliance with emergency procedures, including a list of the functions assigned each category of required crewmembers in connection with an emergency and emergency evacuation duties under §135.123
- Enroute qualification procedures for pilots, when applicable
- The approved aircraft inspection program, when applicable
- Procedures and instructions to enable personnel to recognize hazardous materials as defined in Title 49 CFR, and if these materials

- are to be carried, stored, or handled, procedures and instructions for (1) accepting shipment of hazardous material required by Title 49 CFR, to assure proper packaging, marking, labeling, shipping documents, compatibility of articles and instructions on their loading, storage and handling; (2) notification and reporting hazardous material incidents as required by Title 49 CFR; and (3) notification of the pilot in command when there are hazardous materials aboard, as required by Title 49 CFR
- Procedures for the evacuation of persons who may need the assistance of another person to move expeditiously to an exit if an emergency occurs
- If required by §135.385, an approved Destination Airport Analysis establishing runway safety margins at destination airports, taking into account the following factors as supported by published aircraft performance data supplied by the aircraft manufacturer for the appropriate runway conditions: (1) Pilot qualifications and experience; (2) Aircraft performance data to include normal, abnormal and emergency procedures as supplied by the aircraft manufacturer; (3) Airport facilities and topography; (4) Runway conditions (including contamination); (5) Airport or area weather reporting; (6) Appropriate additional runway safety margins, if required; (7) Airplane inoperative equipment; (8) Environmental conditions; and (9) Other criteria affecting aircraft performance
- Other procedures and policy instructions regarding the certificate holder's operations that are issued by the certificate holder

- Accident/incident response preparedness (flight and ground)
- Staffing
- Safety committee/teams
- Passenger, ground, and flight safety
- Safety recognition/reward program

Aviation department and corporate managers must fully support safety efforts if they are to be effective. Aviation department managers, chief pilots, maintenance managers and all other managers must be aware of and participate in such a program to set the example for others and to track constantly the safety of the department.

NBAA recognizes companies, pilots, maintenance technicians and support personnel who achieve accident-free milestones through its annual Flying Safety Awards Program. An individual company's flying safety program also could distribute its own awards or have one of NBAA's awards as the company goal.

The categories of NBAA Flying Safety Awards are as follows:

- Safe Flying Achievement Award (for milestone years)
- Corporate Business Flying Safety Award
- Commercial Business Flying Safety Award
- Pilot Safety Award
- Aviation Maintenance Department Safety Award
- Maintenance/Avionics Technician Safety Award
- Aviation Support Services Safety Award

In addition to credentials (certificates), criteria for employee selection should include work in the aviation environment on typical company schedules. Some companies use psychological profile tests to screen potential employees. These can prove especially helpful when filling positions that require contact with the public. A pre-employment physical examination by a company-designated physician also is recommended for aviation personnel. Company-specific physiological criteria should be at least as stringent as those standards for a first-class medical certificate.

1.4. Safety Management Systems

Through the use of safety management systems (SMS), business aircraft operators can proactively identify and manage risks. Under a formalized SMS, operators voluntarily identify potential hazards, track them and ensure that processes are put in place to effectively manage them. NBAA advocates that flight departments of all sizes implement an SMS for aircraft operations that is proactive, flexible and scalable and that reflects the size, scope and complexity of the operation.

The International Civil Aviation Organization (ICAO) Standards and Recommended Practices (SARPS) found in Annex 6, Part 2 specify that an SMS is required for operators of non-commercial aircraft over 12,500 pounds or turbojet powered aircraft. The effective date for ICAO member states (countries) to begin implementation of these standards is November 2010. Effective on January 1, 2009, the ICAO standards applicable to commercial operators required member states to include in their state safety program the requirement for commercial operators to implement a SMS. While the FAA has yet to issue any SMS regulations for U.S. registered operators, NBAA is confident that any future regulations will be based on ICAO SARPS.

ICAO has set the general standard for SMS implementation, but it is up to individual states to develop the specific regulatory language. In addition to becoming familiar with ICAO SARPs, NBAA Members should also look at the applicable regulations in the countries where they plan to operate. In fact, Part 91.703 of the Federal Aviation Regulations stipulates that operators of U.S.-registered aircraft must comply with the applicable regulations of the foreign country in which the aircraft is operated.

In general, an SMS contains the following four components along with associated elements:

- Safety policy and objectives
 - Management commitment and responsibility
 - Safety accountabilities
 - Appointment of key safety personnel
 - Coordination of emergency response planning
 - SMS documentation
- Safety risk management
 - Hazard identification
 - Safety risk assessment and mitigation
- Safety assurance
 - Safety performance monitoring and measurement
 - The management of change
 - Continuous improvement of SMS
- Safety promotion
 - Training and education
 - Safety communication

For the latest SMS information, visit the NBAA web site at www.nbaa.org/sms.

INTERNATIONAL STANDARD FOR BUSINESS AIRCRAFT OPERATIONS (IS-BAO)

The International Standard for Business Aircraft Operations (IS-BAO) is a code of practice designed to help flight departments worldwide achieve high levels of safety and professionalism. Introduced in 2002, IS-BAO was developed by the International Business Aviation Council and its member associations, including NBAA.

IS-BAO identifies the baseline industry best practices that operators should apply in structuring and staffing their flight departments and planning and conducting their operations. This code of practice is designed to be scalable, meaning that they can be used by any flight operation, regardless of size. At the core of the IS-BAO is an SMS toolkit for business aircraft operators, from single aircraft/single-pilot operations to large multi-aircraft flight departments. NBAA recommends IS-BAO implementation as an active means of managing safety risk.

IS-BAO has been granted official European recognition as an industry standard for business aircraft operations. This recognition was achieved through a European Committee for Standardization (CEN) Workshop Agreement. CEN is the official standards setting body of the European Union and Workshop Agreements are one of their principle standards products.

The European Aviation Safety Agency also proposes to recognize IS-BAO as a means of compliance with its new non-commercial operating regulations and SMS requirements. Additionally, the United Kingdom Overseas Territories have recognized IS-BAO registration as the preferred means of complying with their non-commercial operating rules and SMS requirements. These endorsements demonstrate that as major aviation authorities around the world begin to implement SMS regulations, they are looking to IS-BAO as a model.

Operators following IS-BAO also meet the applicable ICAO standards, which in some cases may exceed those required for U.S. operations under the FARs. Flight departments using IS-BAO therefore ensure that their operations are world-class. For more information about IS-BAO, visit www.nbaa.org/ops/is-bao.

1.5. Department Staffing Guidelines

Staffing of the aviation department should be a joint effort between the company personnel (or human resources) department and the aviation department manager. The personnel department provides the expertise necessary to ensure compliance with Federal and state employment regulations and conformity with company standards. The aviation department manager has personal knowledge of the unique requirements relating to the Federal Aviation Administration's (FAA's) aviation requirements and skills. Between the two, procedures for recruitment, applications,

interviews, reference checks, certification, flight checks and employment can be established.

Recruiting organizations that specialize in aviation personnel may be engaged to assist with selection and hiring personnel. (The Products and Services section of the online NBAA Member Directory could be a helpful reference.) The recruiting and hiring procedures of the company must be adapted to the needs of the aviation department by allowing the aviation department manager to participate in the selection process and have the final word on who is hired. The aviation department manager's duties include flight checks or other practical tests, where appropriate.

In addition to credentials (certificates), criteria for employee selection should include work in the aviation environment on typical company schedules. Some companies use psychological profile tests to screen potential employees. These can prove especially helpful when filling positions that require contact with the public. A pre-employment physical examination by a company-designated physician also is recommended for aviation personnel. Company-specific physiological criteria should be at least as stringent as those standards for a first-class medical certificate.

LAW REGARDING EEO

When hiring, aviation department managers need to know about the following federal laws related to equal employment opportunity (EEO).

- Title VII of the Civil Rights Act of 1964 – Prohibits discrimination based on race, color, religion, sex or national origin. In 1978, the Pregnancy Discrimination Act amended Title VII and clarified that women affected by pregnancy and related conditions must be treated the same as other applicants and employees on the basis of their ability or inability to work. The Civil Rights Act of 1991 amends Title VII to provide for jury trials, compensatory and punitive damages, and easier burdens of proof for claimants.
- Equal Pay Act of 1963 – Prohibits pay differentials based on sex. Employers may not pay employees of one sex less than they pay employees of the opposite sex for work that requires equal skill, effort and responsibility and is performed under similar working conditions.
- Age Discrimination in Employment Act – Prohibits discrimination against individuals age 40 or older (as of January 1, 1987).
- Americans With Disabilities Act of 1990 (ADA) – Title I of the act makes it unlawful for employers to discriminate against employees on the basis of disability. Reasonable accommodations must be provided unless it would pose an undue hardship to an employer (effective July 26, 1992).
- Family and Medical Leave Act of 1993 (FMLA) – Requires employers of 50 or more employees to provide 12 weeks of job-protected leave to eligible employees for the fol-

lowing reasons: (1) to care for the employee's child after birth or placement for adoption or foster care, (2) to care for the employee's spouse, son, daughter or parent who has a serious health condition or (3) for an employee's own serious health condition that makes the employee unable to perform his or her job.

- Executive Orders 11246 and 11141 – Bans discrimination on the basis of race, sex, disability and veterans' status and requires affirmative action on the part of certain federal government contractors. Executive Order 11141 prohibits discrimination on the basis of age by government contractors.
- Vocational Rehabilitation Act of 1973, sections 503 and 504 – Bans discrimination against disabled persons by federal contractors and grant recipients, who also are required to take affirmative action in hiring qualified disabled individuals.
- Vietnam Era Veterans' Readjustment Assistance Act of 1974 – Calls for affirmative action by federal contractors to employ and advance in employment qualified veterans of the Vietnam era and disabled veterans.
- Civil Rights Act of 1866 – Prohibits racial discrimination in certain areas of private employment.
- Immigration Reform and Control Act of 1986 – Bans intentional discrimination on the basis of citizenship or national origin and applies to employers of four or more. These anti-discrimination provisions do not apply to illegal aliens or in the limited circumstances when U.S. citizenship is required by law.
- Fair Labor Standards Act – Requires minimum rates of pay and overtime for most employees.
- Employee Polygraph Protection Act. Generally prohibits private employers from requiring or requesting any employee or job applicant to take a lie detector test (except in very limited circumstances) and from discharging, disciplining or discriminating against an employee or prospective employee for refusing to take a test.

LAW REGARDING WORKPLACE BEHAVIOR

Aviation department managers also should be aware of both state and federal requirements for appropriate workplace behavior. Managers are required to enforce appropriate behavior as well as be aware of and take action to prevent undesirable behavior of their employees. If an employee is displaying inappropriate behavior, managers should contact their human resources representative for advice and direction. For employers who do not have a human resources representative, listed below are common workplace behavior/issues and related regulation/public law links:

- Sexual Harassment – www.eeoc.gov/types/sexual_harassment.html

- Violence in the Workplace – www.dol.gov
- Workplace injuries – www.osha.gov
- Equal Employment Opportunity Requirements – www.eeoc.gov

Each of these web sites contains valuable information to assist managers.

1.6. Aviation Department Personnel

The best-qualified person should be chosen for each position in the department. The selection process must take into account the individual characteristics of each employee and the job functions to be performed. The ability of the department to operate in a safe, efficient and economical manner will depend upon its employees.

The number of personnel and job functions needed depends upon the complexity of the company's operation. Refer to the *NBAA Compensation & Benchmark Survey* for comprehensive review of aviation department personnel salaries and operational data. The following are some of the job functions that may be required for flight and ground operations:

Flying Operations:

- Aviation department manager or director of aviation
- Safety manager/officer
- Chief pilot
- Captain (pilot in command)
- First officer (second in command)
- Flight engineer
- Flight attendant
- Chief dispatcher/scheduler/travel services(passenger/ aircraft and crew scheduling)

Ground Operations:

- Manager of maintenance
- Lead maintenance technician/maintenance foreman/chief inspector
- Maintenance technician
- Avionics technician
- Scheduler/dispatcher/travel/flight coordinator
- Line service personnel or hangar attendant

The aviation department manager should report to the highest office possible in the corporate management structure where appreciation of and support for the operation can be obtained. Also, the aviation department must fit into the corporate structure and should not be treated as a separate entity.

Once the aviation department manager has been designated, company management and the manager should agree upon the corporate reporting structure, as well as the manager's specific responsibilities and authority. NBAA recommends that the activities of the aviation department be required to interrelate with other corporate functions (e.g., developing uses for the aircraft that would integrate it into marketing programs, customer and public relations, or humanitarian missions).

A sample reporting chart for a larger aviation department is found in **Figure 1.3**. In larger operations, a chief pilot can be given duties related to flightcrew schedules, recurrent training, standardization and so forth.

When the aviation department has several aircraft and flightcrews in addition to a maintenance department, the administrative duties multiply. Administrative duties are the primary responsibility of the aviation department manager; however, assistance from other functional managers, such as the corporate comptroller, salary administrator, or purchasing agent, is necessary.

In smaller departments (one or two aircraft) the chief pilot may perform the administrative duties of the aviation department manager in addition to flightcrew duties. A sample reporting chart for a smaller aviation department is provided in **Figure 1.4**.

In this case, the aviation department manager and chief pilot may be dual, interchangeable titles. The scope of responsibility depends on the size of the aviation department. Some duties may be designated to other company departments as well.

AVIATION DEPARTMENT MANAGER

The responsibilities of the aviation department manager can be divided into two categories: administrative and operational.

Administrative duties include:

- Reporting to an individual as high as possible in the corporate management structure
- Developing and instituting department policies and procedures – including basic company policies, procedures and objectives – into departmental functions
- Preparing annual operating budgets that include operating expenses, facilities, supplies, outside services, personnel, training, capital expenses and reserves
- Monitoring an operating budget on a monthly, quarterly, or semiannual basis, depending on company procedure
- Reporting deviations between estimated expenditures and actual costs to higher management with appropriate explanations according to company procedure
- Establishing scheduling policies and procedures that provide effective control and management

- Establishing and maintaining liaisons with relevant company personnel;
- Establishing, with the cooperation and assistance of company personnel and salary administration officers, minimum employment qualifications, hiring procedures, salary structure, performance appraisal procedures, grade structure and dismissal procedures
- Advising management on the status and requirements for aircraft and other equipment consistent with the company's transportation needs and goals
- Recommending additions to the department, which include comparative aircraft studies
- Establishing measures of effectiveness and efficiency for the department
- Establishing and maintaining records as required by the FARs, manufacturers, and company policies
- Monitoring these records if they are maintained by an outside agency, such as a computer service
- Scheduling and establishing criteria for annual technical audits of the aircraft and maintenance operations
- Reporting results of a technical audit to immediate superiors with an explanation of deficiencies found and corrective actions taken
- Preparing short- and long-range plans that include corporate and departmental objectives
- Developing department personnel to realize their full potential

Operational duties include:

- Providing leadership and direction to flight and maintenance personnel to ensure personal performance and competence
- Establishing and maintaining an active aviation safety program
- Ensuring that high levels of customer service are provided to the company and its customers
- Maintaining an operations policy manual to include flight, maintenance and pertinent company policies
- Ensuring that department personnel are thoroughly familiar and comply with company policies, appropriate FARs and pertinent operating manuals, practices and publications
- Establishing programs for pilots and maintenance technicians, including proficiency reviews, initial training, recurrent training and upgrade training
- Analyzing various training sources, which could include aircraft training flights, simulator training, enroute flight checks, ground school training and prepackaged learning courses

Figure 1.3: Sample Corporate Flight Department Reporting Chart – Larger Department

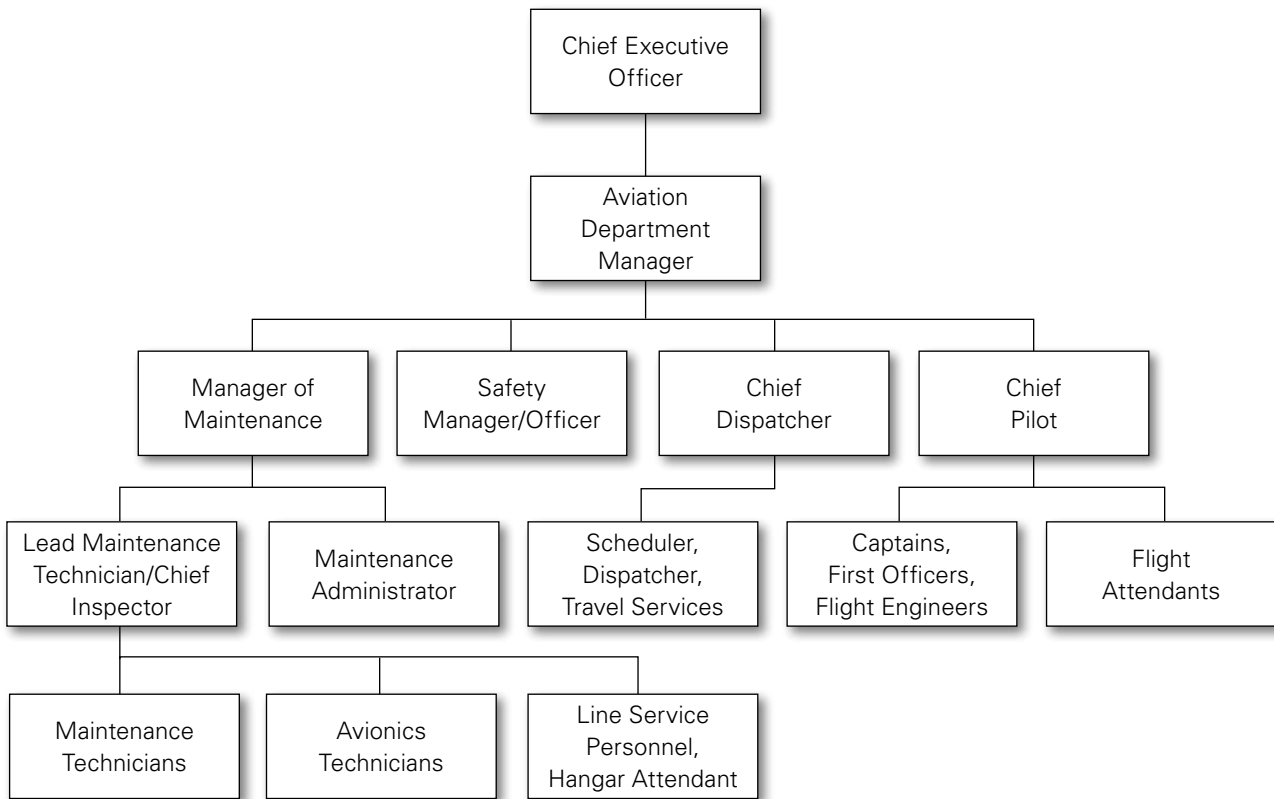
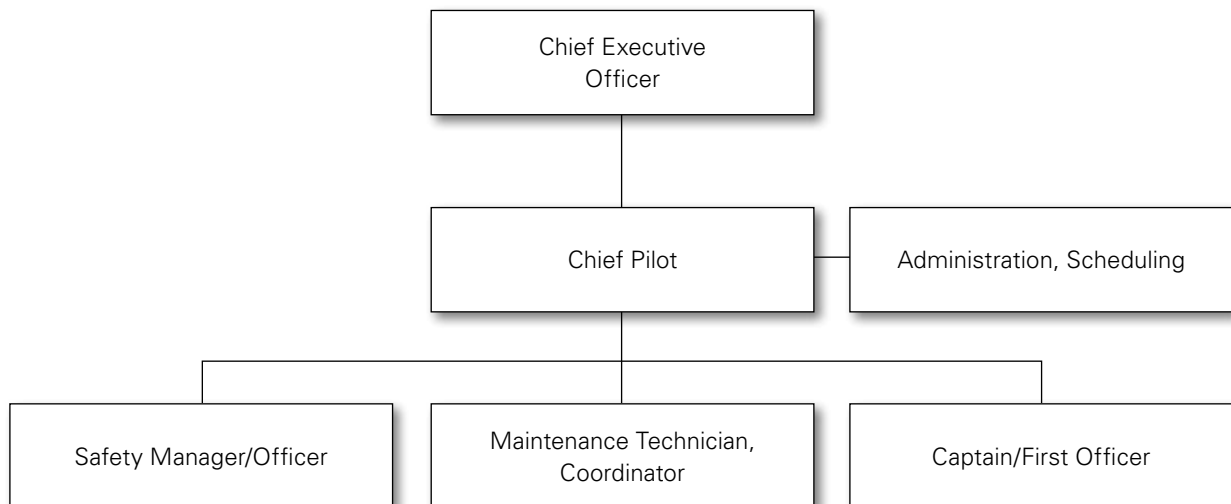


Figure 1.4: Sample Corporate Flight Department Reporting Chart – Smaller Department



- Anticipating the need for upgrade training to meet additional or replacement needs
- Evaluating department personnel periodically to ensure superior levels of performance
- Establishing standards and limitations to ensure safe and efficient department operations
- Establishing flight dispatch policies and procedures that govern the approval, delay, or cancellation of flight operations
- Monitoring the flightcrew and dispatchers to ensure they comply with flight dispatch policies and procedures
- Coordinating the activities of the maintenance department with flight operations to achieve the company's goals and objectives
- Helping personnel understand the company's objectives and each other's needs
- Establishing and monitoring security procedures to protect the aircraft and company facilities
- Establishing and maintaining lists of aviation-related vendors that meet the highest level of aviation safety
- Representing the company in aviation matters through trade associations, the FAA, state or municipal aviation bodies, airport management, community organizations and contract agencies
- Maintaining high morale through an awareness of company and department policies, employee development programs and periodic department meetings for the two-way communication of ideas, goals and objectives
- Implementing specific programs of local, regional, or national concern, consistent with company policy, in such areas as affirmative action, energy conservation, equal employment opportunity (EEO) and environmental control
- Establish severe weather/natural disaster procedures to protect personnel, aircraft and facilities. Procedures should address plans for (but not be limited to) situations involving hurricanes, tornados, high winds, flooding and hail

SAFETY MANAGER/OFFICER

NBAA recommends that Corporate Members appoint at least one individual to fulfill the safety manager/safety officer function and that this person report directly to the aviation department manager, or equivalent. The safety manager serves as a liaison with NBAA on all matters related to safety. The Association further recommends the following responsibilities for this position:

- Acts as resident expert on matters related to all aspects of safety
- Ensures that safety program elements are carried out
- Acts as liaison with safety organizations (formal and informal) on matters of industry safety concerns

- Provides periodic reports to management on program status and compliance
- Monitors trends in voluntary reporting system and accident and incident reports
- Makes recommendations to correct/prevent identified safety issues
- Communicates safety issues to all within the flight department
- Monitors compliance with applicable safety standards (e.g., DOT, FAA, OSHA, EPA)
- Monitors corrective/preventive actions

The person assigned to this position should have extensive operational experience in aviation, including knowledge of safety programs, standards, safe operating procedures, and Federal Aviation Regulations. Additionally, anyone responsible for the safety function should have completed an aviation safety education program consistent with the position's responsibilities. If the individual has not completed an aviation safety education program prior to appointment to the position, he or she should attend one to supplement his/her experience. Further, participation in industry safety meetings, conferences, and schools is considered an essential part of the continuing education of the appointed individual. Ideally, the qualified person should have at least the following qualifications:

- Pilot, mechanic, or dispatcher certificate or equivalent experience
- Knowledge of:
 - Aviation-related safety programs
 - Safety standards applicable to aviation operations
 - Accident causation and prevention theory
 - Safety margins
 - Risk management techniques
 - Human error
 - Exceptional interpersonal and communication skills

CHIEF PILOT

If an aviation department manager is employed, the chief pilot should report to that person and perform such duties as the manager assigns. If only a chief pilot is employed, all of the aviation department manager's duties, as detailed above, will be performed by the chief pilot, in addition to the duties listed below.

Chief pilot duties include:

- Remaining informed of the latest developments within the business aviation community, including the FARs, and other Federal, state, local and foreign regulations affecting operations

- Establishing and supervising the initial and recurrent training of aviation department personnel, both internally and externally with a professional training facility
- Instructing flightcrews in the use of the standard operating procedures (SOP) manual
- Ensuring that revisions and amendments to the standard operating procedures are current
- Preparing and distributing periodic reports and statistics as required
- Assisting with the preparation of budgets and financial forecasts
- Reviewing the current budget implementation
- Evaluating department expenditures incurred by subordinates
- Preparing flight plans (unless done by a scheduler or dispatcher)
- Ensuring that the aircraft is clean and prepared for flight with all provisions on board for the safety and comfort of the passengers
- Reviewing and calculating the aircraft weight and balance, fuel on board and performance charts
- Using checklists
- Supervising the first officer (second in command) in any duties necessary for the smooth, safe and efficient operation of the aircraft
- Coordinating the functioning of all crewmembers assigned to the flight
- Monitoring crew performance, sharing knowledge with crewmembers and evaluating crewmember potential for advancement
- Making decisions necessary to start, delay, or cancel flights and deviate the flight from planned route or destination when operating conditions dictate

If the chief pilot also is the aviation department manager (and perhaps a line captain), the chief pilot's duties could appear overwhelming. In this instance, many of the listed duties should be delegated to other aviation department members. Administrative and personnel functions should be delegated to non-aviation department corporation members.

NBAA deals with many of the representation and information duties of aviation departments, but outside contractors could be required. Aircraft management, maintenance management and training organizations can help fill any voids that exist within the aviation department. All of the duties and functions listed for the aviation department manager and chief pilot are valid. However, the level of emphasis assigned to each is a function of the size and duty of the aviation department.

CAPTAIN

Captains are responsible for the safe conduct of flights to which they are assigned. Captains report directly to the chief pilot. When assigned to a flight, the captain has the final authority in the operation of the aircraft. Captains must ensure compliance with all Federal, state, local and foreign regulations, as well as the policies and procedures specified in the company operations manual. Captains are the company's most visible representative to the passengers and must act with tact and decorum while ensuring an efficient and safe operation.

The duties of a captain include:

- Acting as pilot in command (PIC) of flights for which the pilot has been scheduled
- Providing excellent customer service to passengers
- Complying with schedules, and other directives governing the aircraft's operation
- Ensuring that preflight inspections are performed
- Studying weather conditions at destination, enroute, alternate airports and departure points

FIRST OFFICER (COPILOT)

The first officer reports to the chief pilot and is responsible to the captain of the flight for the conduct and execution of assigned duties.

Some of the first officer's duties include:

- Assisting the captain with discharging safety responsibilities
- Providing excellent customer service to passengers
- Performing duties as assigned during flight preparation and in flight
- Being prepared to assume the duties of the pilot in command in the event the pilot in command is incapacitated
- Being familiar with and following all FARs and company policies pertinent to assigned duties

In addition, another flightcrew member, such as a flight engineer, may be assigned to duty in an aircraft during flight time.

FLIGHT ATTENDANT

FAR Parts 91.533, 125.169 and 135.107 require the presence of a flight attendant (also known as a third crewmember) on any aircraft carrying more than 19 passengers. However, given the complexities and duties involved in order to operate with the utmost safety, some companies routinely utilize a flight attendant even with fewer than 19 passengers. Professional flight attendants should be trained and qualified in cabin safety and equipment specific to the aircraft as well as inflight medical emergencies.

A qualified flight attendant is fully trained under 14 CFR Part 91.1063 and 14 CFR Part 135 Subpart H and has successfully passed the testing requirements of 14 CFR Part

91.1067 and 14 CFR Subpart G. Training would include but not be limited to:

- Basic indoctrination, which covers all appropriate regulations and the related company's procedures for complying with those rules
- Initial aircraft training on all the aircraft to which a flight attendant will be assigned
- Emergency situations and drills, security, hazardous material, and knowledge of drug and alcohol program requirements

The flight attendant is the person who instructs and leads passengers to safety during any type of emergency (such as fire, decompression, medical problems, planned and unplanned land and water evacuations, and unwarranted evacuations). This crewmember is knowledgeable, trained and qualified on how to operate the aircraft emergency equipment and may perform sensitive safety functions.

The senior or chief flight attendant should report to the pilot in command to coordinate and keep standardized all flight attendant duties and procedures.

Chief flight attendant duties include:

- Performing duties as assigned by the pilot in command
- Training annually on business aviation-specific emergency training, hazardous materials (hazmat), crew resource management (CRM) and wing contamination
- Remaining proficient in all aircraft safety equipment, FARs and hazmat
- Being knowledgeable of and staying current with FARs and company policies and procedures
- Providing emergency medical assistance for passengers when required
- Providing good customer service to passengers
- Establishing and maintaining a flight attendant manual to be included in the flight operations manual
- Establishing and maintaining processes and procedures
- Establishing a crew and passenger profile for catering and pre-existing medical conditions
- Facilitating and ensuring communication between flight attendants and other members of the flight department
- Establishing vendor relationships for the purpose of training and service
- Assisting in the hiring, managing and training of flight attendants
- Preparing a budget for catering and aircraft supplies
- Establishing a food safety program

- Maintaining the official training records for all flight attendants for FAA review
- Establishing relationships with other chief flight attendants to use as benchmarking

Flight attendant duties include:

- Performing duties as assigned by the pilot in command and chief flight attendant
- Training annually on business aviation-specific emergency training, hazmat, CRM and wing contamination
- Remaining proficient in all aircraft safety equipment FARs and hazmat
- Being knowledgeable of and staying current with FARs and company policies and procedures
- Providing emergency medical assistance for passengers when required
- Conducting pre-flight aircraft procedures and ensuring that all safety, galley and cabin equipment is ready for flight
- Maintaining order in the cabin at all times
- Ensuring passenger briefing is in compliance with FAA regulations
- Ensuring that all carry-on items are secured and that passengers have fastened their seat belts and shoulder harnesses, if installed
- Advising flight deck crew that cabin is secured and ready for departure
- Initiating service after aircraft has reached a safe altitude and after verifying weather conditions with the flight deck
- Preparing passengers and cabin for arrival in compliance with FAA regulations
- Cleaning and readying the aircraft and advising the flight deck crew of any cabin discrepancies
- Keeping training records on file for FAA review
- Providing good customer service to passengers
- Planning menus and ordering catering

Flight attendants must be able to assess and respond to any given medical or emergency situation accurately. In conjunction with the standard training curriculum described in the Flight Operations section of this guide, it is recommended that the third crewmember be scheduled under the same flight, duty and rest limitations as the flight deck crew.

A related function with lesser duties than that of the flight attendant is the service-oriented crewmember, also referred to as a cabin aide, cabin attendant or CSR. This position:

- Provides good customer service to passengers
- Plans menus and orders catering

- Has a limited knowledge of securing the galley

The service-oriented crewmember is only trained on a limited scope of safety functions, so this crewmember is not the person who would provide aid and leadership to passengers in an emergency situation, in the way that a flight attendant would. This distinction needs to be made for passengers by the pilot in command.

FLIGHT TECHNICIAN (MECHANIC)

Some companies may wish to operate with a flight technician onboard the aircraft. The flight technician reports to the pilot in command. Duties include:

- Supervising the refueling and checking of fuel and lubricants
- Baggage handling and complying with aircraft baggage and cargo restrictions
- Receiving and stowing catering materials
- Assisting passengers during flight
- Assisting the flightcrew with ground and airborne duties, as requested
- Conducting postflight inspections
- Performing aircraft maintenance as required
- Providing emergency assistance to passengers as necessary

SCHEDULER/DISPATCHER, FAA-LICENSED DISPATCHER, FLIGHT/TRAVEL COORDINATOR

Every flight department has an individual who schedules the corporate aircraft. Whether it is a dispatcher, a scheduler, an FAA-licensed dispatcher, or a flight or travel coordinator, that individual must be capable of making time-dependent logistical decisions related to safety of flight, security, personnel and costs. This person usually reports to the aviation department manager or director of operations.

Today's technological environment requires that this person have sophisticated computer and communication skills compatible with executive level management.

Some of the responsibilities of this position are:

- Scheduling travel for executives on the company aircraft or considering other lift alternatives
- Knowing company aircraft performance and company operations manual and making appropriate recommendations to traveling executives
- Providing flightcrew with flight plan and weather information (including filing flight plans and providing trip briefings, fuel advisement and route briefings)
- Knowing complex computer software related to flight dispatching and logistic support
- Maintaining and updating aircraft and crew schedules

- Obtaining for both passengers and flightcrew any necessary permits or visas when flying into and out of foreign countries
- Maintaining department records (including flight, manifest, maintenance, insurance and personnel records) to ensure accurate reporting, currency and accounting issues
- Coordinating with outside aircraft services handler for international flights as needed
- Maintaining an inventory of charts and related materials for flightcrew
- Preparing trip packets for crew and passengers for all flights
- Coordinating aircraft handling and fueling with fixed based operators
- Negotiating fuel discounts with fuel providers
- Providing accounting services (not limited to tax information, SIFL reporting, auditing and report generation), including submitting invoices for payment, processing chargebacks and participating in annual budget preparation
- Coordinating use of charter services or fractional shares to meet company guidelines
- Scheduling flightcrew to ensure compliance with company and FAA regulations regarding currency, flight and duty times
- Ensuring that aircraft schedules meet with any airport/airspace restrictions
- Knowing Federal Aviation Regulations and company policies to remain compliant with same in all operations
- Maintaining a flight following system to ensure safety of flight
- Coordinating scheduled and non-scheduled aircraft maintenance with the maintenance department manager
- Developing and maintaining security policies and procedures to ensure the safety of the people, facilities and equipment of the operator, and communicating policies/procedures as needed to passengers
- Determining security needs and making necessary arrangements for all trips, particularly foreign destinations
- Obtaining AROs and communicating to passengers the changes needed in itinerary to accommodate the ARO received
- Interfacing with flightcrews to advise of passenger needs or requirements
- Acting as effective liaison between management and flightcrew
- Scheduling ground transportation and accommodations for both flightcrew and company travelers

- Arranging catering services in accordance with company and passenger requirements
- Remaining current on resources available and training opportunities to facilitate an effective scheduling operation

1.7. Pilot Qualifications

Pilots must be selected on the basis of the many factors already discussed in this manual. A pilot history form may be developed to determine pilot qualifications. It can be combined with the personnel department's traditional employment history form.

The pilot history form should include the following information:

- FAA certification and ratings
- Aviation education and training
- Total flight time
- Total pilot in command flight time
- Recent flight experience
- Instrument flight time
- Proficiency and line checks
- Type of aircraft flown

Under the Freedom of Information Act, anyone may request a search of the FAA's Accident/Incident Data System and Enforcement Information System for any records pertaining to an individual. When requesting records, include the airman's full name, certificate number, social security number and date of birth. This request may be faxed to the FAA at (405) 954-4655, or it may be sent to the following address:

U.S. Department of Transportation
Federal Aviation Administration
Aviation Data Systems
Branch, AFS-620
P.O. Box 25082
Oklahoma City, OK 73125

The request must specify if accident, incident or enforcement information, or all three, are needed. Requests that are faxed are usually answered within two weeks. Requests that are mailed may take up to a month and a half.

Many companies establish minimum educational qualifications, such as an Associate or higher college degree, in addition to the FAA's requirements and minimum flight hours. A company that establishes a corporate aviation department for the first time should use as much information as possible from publications or trade organizations when establishing these qualification guidelines, such as NBAA's Compensation & Benchmark Survey. Company executives and Human Resources departments, or the aviation department managers of other companies with their own aviation

departments, can provide assistance to establish these minimum criteria.

The *NBAA Bylaws* provide requirements and recommendations for Corporate Members that employ professional pilots. Aviation insurance companies also have minimum pilot qualification and experience standards, especially with regard to high-performance aircraft.

As a preliminary guideline, some NBAA Member Companies follow the requirements outlined below. In addition, any pilot considered for employment must be neat in appearance, possess a competent work ethic, be a team player and have the ability to communicate intelligently with all other flight department personnel as well as with the company's executives and clients.

Each captain/pilot in command (PIC) and first officer/second in command should meet certain basic requirements. The following guidelines can be adjusted and adapted to each unique operation, considering number and type of aircraft, number of existing crewmembers and their qualifications, previous experience and qualifications of the new crewmember.

The captain/PIC should:

- Hold an airline transport pilot (ATP) certificate with appropriate type ratings
- Have logged a minimum of 3,000 flight hours with 500 flight hours in the type of aircraft
- Hold a first class medical certificate
- Meet all currency requirements regarding instrument flight time and night landings prior to flying any required trips
- Be able to pass an instrument competency check in the category of aircraft to be flown
- Have logged (if the pilot will be flying as a captain on turbine-powered aircraft) 500 hours as PIC in turbine-powered aircraft

The first officer/second in command should:

- Hold a commercial certificate with appropriate category and class ratings
- Hold an instrument rating
- Have logged a minimum of 1,500 flight hours,
- Hold a second-class medical certificate
- Meet all currency requirements regarding instrument flight time and night landings prior to flying any required trips
- Be able to pass an instrument competency check in the category of aircraft to be flown

Some companies require each second in command to obtain an ATP certificate and a first-class medical certificate

by the end of 12 months of employment. Consideration also should be given to the applicant's previous PIC experience and ability to assume PIC responsibilities.

1.8. Number of Pilots Required

The following factors should be considered when deciding the number of pilots required for a company's operation:

- Number of aircraft operated
- Company flight time and rest considerations
- Aircraft hours per year
- Number of concurrent trips
- Number of trips that keep the pilot flying for a number of consecutive days
- Number of trips overnight (RONs)
- Number of night flights
- Number of trips with augmented crew
- Number of trips where flightcrew are prepositioned
- Vacation policy
- Training policy

Consideration also should be given to whether the aviation department manager or chief pilot will fly on a part-time, scheduled, or as-needed basis, or not at all.

Some companies use 1.5 crew (three pilots) per aircraft as a rule of thumb to estimate the number of pilots required. Other methods use more detailed approaches. Two examples are found in **Figures 1.5** and **1.6**. Regardless of the method, the unique aspects of a company's operations, location and personnel must be accommodated. It is essential to customize pilot requirements.

Many times, especially during international operations, a third flightcrew member is used to augment the flightcrew. Another option is to preposition flightcrew at an intermediate stop. This crew change allows a fully rested crew to continue a long-range flight. Consideration should be given to the number of times a third flightcrew member is used or two flightcrew members are prepositioned to meet an aircraft during a long-range trip. This may affect the total number of pilots required.

1.9. Personnel Records

Individual personnel files should be maintained for each aviation department employee. Various laws affect file content and confidentiality. Medical records must be kept confidential between the crewmember and the personal or company physician. All files can be used in a court of law, both for and against the company. Some of the file content may have to be shared with a potential future employer. Flight department managers/chief pilots (FDMs/CPs) should

ensure that all records kept are objective, accurate and well-documented. Content and location of the files should be coordinated with company, legal and human resource policy.

Pilots must be permitted to review their personnel files in accordance with Federal law and company policies. These files should be organized as appropriate to facilitate information retrieval when needed.

The following records should be maintained at the flight department:

- Proficiency check reports (pilot only)
- Flight and ground training records
- Copy of current FAA medical certificate
- Copies of current airman or maintenance certificates
- Copies of other pertinent licenses and ratings
- Copy of Federal Communications Commission (FCC) license (required for international operations)
- Copy of passport

The following files should be coordinated with company human resource personnel for location and content:

- Application for employment, including resume
- Record of receipt of manuals and company-issued material
- Performance evaluations
- Accident and/or incident reports
- Company physical examination records (should not be kept at the flight department to ensure confidentiality)
- Correspondence
- Copies of all letters of commendation or criticism
- Copies of all awards and recognitions

Various performance evaluation instruments exist that adequately and fairly assess a crewmember's performance as a pilot and a company employee. A sample performance evaluation form is provided in **Figure 1.7**. It can be used for all flight department personnel. However, its use should be coordinated with the company human resource personnel. FDMs/CPs should seriously consider adapting this form to the requirements of their own departments (with input from their human resources personnel), and should become familiar with other evaluation instruments (such as 360 Performance Appraisals) in use by other flight departments.

In addition, FDMs/CPs should remain abreast of current and potential human resource/personnel evaluation developments. They should coordinate closely with their company legal and human resource personnel for development and use of personnel evaluation tools.

Figure 1.5: Calculation of Number of Pilots Based on Number of Days Pilot Is Needed

Each company could vary this calculation according to its own requirements. This sample calculation presumes a seven-day-a-week operation (the aircraft is available seven days a week) with a particular pilot available five days a week. Five pilots would be required if a five-day-a-week operation is used.

DESCRIPTION	CALCULATION	TOTALS
Work days/pilot	52 weeks/year x 5 days/week	260
Days not available	<ul style="list-style-type: none"> • Vacation: 15 days • Holidays: 11 days • Sick leave: 5 days • Training and physical examination: 10 days 	
Subtotal of days not available		41
Total days available for duty	260 days – 41 days	219
Number of crew seats (if two per aircraft)	(2 aircraft x 2 pilots/aircraft)	4
Number of operating days/year	7 days per week	365
Number of flightcrew days/year	4 pilots x 365 days	1,460
Number of pilots required (rounded up)	1,460 flightcrew days required/ (219 days available)	7

Note: Does not take into consideration augmented or prepositioned flightcrew.

Figure 1.6: Calculation of Number of Pilots Based on Estimated Flight Hours per Year

This example could be beneficial for a company that expects future flightcrew needs to be similar to past needs. Like the example in Figure 1.5, each company can vary the calculation according to its own needs.

DESCRIPTION	CALCULATION	TOTALS
Number of aircraft in fleet		3
Estimated number of flight hours/year (per aircraft)		450
Total flight time (fleet)	3 aircraft x 450 hours each	1,350
Number of pilots/aircraft		2
Total number of pilot hours	1,350 flight hours x 2 pilots/aircraft	2,700
Duty/flight ratio*	3 hours duty/1 flight hour	3
Number of duty hours/year	2,700 pilot hours x 3 (the duty flight ratio)	8,100
Total hrs. available for duty (ea. pilot)	219** days x 8 hours per day	1,752
Number of pilots required	8,100 duty hours per year/ 1,752 hours available for duty	4.6
Number of pilots required (rounded up)		5

**This ratio assumes that a pilot spends at least three hours on duty for each hour in the air. The duty time includes preflight, postflight and ground time. The ratio could vary for a company that often requires long periods of waiting between flights on the same day.*

***See Figure 1.5 for the calculation of days available for work.*

Figure 1.7: Sample Performance Evaluation Sheet

Job Classification:

Employee's Name:

Department:

Employment Date:

Time on Present Job:

Instructions: Consider the entire evaluation period, not just isolated incidents.

5. Outstanding: Exceeds persons typically found in job. Should be in top 10 percent, very little improvement possible.

4. Above Average: Displays abilities that exceed 70 percent of the people on this level. Does superior work although some improvement possible.

3. Effective: Doing a respectable job in present assignment; performance may range from adequate to good.

2. Marginal: Developing slowly or evidences limitations in handling present duties; improvement needed.

1. Inadequate: Unsatisfactory at present time. Major improvement required.

1. Accomplishments:

1 2 3 4 5

Does the job get done?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much useful work does the employee turn out in relationship to others?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the employee able to get out special work when needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the work output of the employee and subordinates of high quality and accuracy?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Explanation _____

2. Technical Competence:

1 2 3 4 5

Does the employee possess the required skills necessary for this position?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does the employee have technical knowledge of related areas?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Explanation _____

3. Communications:

1 2 3 4 5

Is the employee able to express ideas effectively?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the employee concise?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the employee an effective listener?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Explanation _____

4. Planning and Organization:

1 2 3 4 5

Does the employee budget time or get bogged down in routine, lost in details?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How does the employee operate under pressure?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the employee's work planned and organized?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
What is the employee's actual performance as compared to established target?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Explanation _____

Figure 1.7: Sample Performance Evaluation Sheet (cont.)

Numbers 5 and 6 are to be completed for supervisory personnel

5. Leadership:

1 2 3 4 5

- Does the employee have the respect of the employees in the department?
- Does the employee motivate these people to do their jobs effectively?
- Does the employee show a real concern for developing these people?
- Does the employee show respect for the rights, feelings and welfare of others?
- Do the people in the employee's peer group respond and cooperate?

Explanation _____

6. Safety and Housekeeping:

1 2 3 4 5

- Does the employee set an example for others?
- Does the employee take steps to institute good safety and housekeeping practices?

Explanation _____

Strengths and Weaknesses:

1. What do you consider the employee's greatest strengths to be? _____

2. What do you consider the employee's greatest deficiency to be? _____

Developmental Potential:

1. Outline your development plans for the employee: _____

Employee Comments: _____

Supervisor's Signature _____ Date _____

Employee's Signature _____ Date _____

PILOT RECORDS IMPROVEMENT ACT

The Pilot Records Improvement Act (PRIA) was enacted primarily as a result of certain airline accidents attributable to pilot error. The accident investigations found that although the pilot or pilots had a history of poor performance, their backgrounds were not investigated by the current employers. As an FAR Part 91 corporate or business operator, the PRIA does not apply to you in the hiring phase. However, after a pilot leaves your employ, if requested, you *are* required to pass along specific records (listed below) for that pilot.

Operators that fly either full-time or part-time under FAR Part 135 are required to gather specific past records of a new pilot within 90 days of hiring the person. The new Part 135 employer must request and receive records from anyone who has employed the applicant as a pilot during the past five years. This request must include a signed written consent of the pilot applicant. The consent immunizes the former employer from any Federal, state, or local lawsuits brought by the pilot, unless the information provided is intentionally false.

Former employers (including Part 91 operators) must, within 30 days after receiving the request, provide records pertaining to (a) training, qualification, proficiency, or professional competency of the pilot; (b) any disciplinary action that was not subsequently overturned; (c) any release from employment or resignation, termination, or disqualification with respect to employment; and (d) any FAA-mandated alcohol and drug testing program results. For further information see Advisory Circular 120-68.

1.10. Pilot Logbooks

Each pilot is required by FAR Part 61 to ensure proper certification and currency to exercise the privileges for each type of operation in which they participate. Additionally, since pilots are controlled by the aviation department through scheduling, the chief pilot should oversee pilot qualifications and currency to ensure compliance with both Federal regulations and company policies. Management may accomplish this through required reports from crewmembers or from a separate database maintained incident to recording flight operations information.

Currency items to track include:

- Pilot in command (PIC) proficiency checks
- Flight evaluations
- Required training
- Takeoff/landing (including night)
- Actual instrument time and approaches
- Date and class of last FAA medical
- Additional qualifications (international, MNPS, CAT II, external load, etc.)

1.11. Salaries and Fringe Benefits

The company human resource department and the flight department manager/chief pilot (FDM/CP) have the responsibility to develop a salary framework that fits into the company's salary structure and adequately compensates aviation department personnel. This is an important function of the FDM/CP to ensure that human resource personnel fully understand and appreciate the unique qualifications and work performance required of flight department personnel.

NBAA publishes an annual *Compensation & Benchmark Survey*. The survey is based on information provided by NBAA Members and presents information in a way that ensures confidentiality. The salaries are broken down by type of certificate, seniority with company, years in current position, age, industry group and other factors. Additionally, the FDM/CP may want to review other salary survey instruments available through various aviation industry sources.

The following positions are included in the *NBAA Compensation & Benchmark Survey*:

- Aviation department manager (non-flying)
- Aviation department manager (flying)
- Chief pilot
- Senior captain
- Captain
- Copilot
- Manager of maintenance
- Maintenance foreman
- Airframe and powerplant (A&P) maintenance technician
- Maintenance technician helper
- Avionics technician
- Scheduler
- Dispatcher (licensed)
- Flight engineer
- Flight attendant
- Line service personnel

Most aviation department employees are covered by the company benefit programs. Such programs generally include vacations, sick leave, leave of absence, insurance

(e.g., accident, health, travel, disability), and retirement, and may also include bonuses, stock options, profit sharing and other benefits. Two such items are of particular interest to flightcrew members: (1) early retirement and (2) short-term disability programs.

1.12. Pilot Retirement Considerations

The “ideal” retirement age for business aircraft pilots is subject to debate and is of interest to both pilots and management alike. In 1986, Federal legislation was passed declaring that there can be no mandatory retirement age for employees. There have been numerous legal challenges to corporate flight department policies requiring pilots to retire at age 60, and there now are very clearly established legal precedents stating that companies may not require pilots to retire at age 60. The wording of FAR Section 121.383, stating a pilot age 60 or over may not serve as a pilot in airline operations, does not serve as legal precedent for any flight department operating under FAR Part 91.

Additionally, Equal Employment Opportunity law requires that all employees be treated the same, regardless of age, unless there is a bona fide qualification (BFQ) that requires them to be so treated. The law implies that pilots over age 60 may not be required to submit to any additional medical tests or checks that are not required of pilots under age 60. It is very difficult to prove BFQ, and there currently are no statistically correlative data that prove pilots over age 60 are any less qualified medically to continue piloting aircraft.

With the current regulatory environment, stipulations of the company’s retirement program, and physical limitations that may affect pilot performance, it may be difficult for management to administer a specific retirement plan for its pilots. Establishing an exception to a basic plan in an equitable manner may not seem fair to other employees. Therefore, though they may not stipulate by formal policy that a pilot must retire by age 60, many flight departments have instituted pilot retirement plans that provide financial incentives adequate enough to encourage pilots to retire by age 60.

Retirement programs are as varied as the companies that provide them. Some companies keep pilots on the same retirement plan as other corporate employees. Some companies with mandatory retirement ages earlier than age 70 also provide additional compensations.

The following compensation policies were among those reported to NBAA:

- Place the pilot, if qualified, into another position within the company
- Credit additional years of service to bring a pilot up to normal retirement benefits
- Add additional “points” to the pilot’s retirement program
- Continue to provide health and insurance benefits
- During those years between a pilot’s “early” retirement and age 62, pay the pilot what Social Security pays pilots who actually retire at age 62
- Pay all or part of a pilot’s actual salary between retirement and age 62

- Raise the salary to the maximum
- Award a two-year severance pay as salary continuation
- Pay a salary equal to three years salary for the five years between age 60 and age 65
- Pay double the retirement pay until age 62
- Pay the early retiree the same early retirement allowance as other employees retiring at age 62 with level of payment continuing to age 65
- Pay 60 percent of base pay until retired at age 62, or 100 percent of annuity at age 55, or 53 percent of annuity at age 50 with 10 years service
- Award 85 percent of present salary for five years, at age 60, then revert to full pension pay
- Pay full salary for two years for non-working capacity
- Pay 100 percent of retirement benefit at age 60 and 9 percent of last annual salary additional for life
- Pay additional 12 months salary on retirement
- Pay 85 percent of pension at age 60 that would have been paid at age 65

The particular retirement approach taken by flight department management should reflect careful consideration of current legal, human resource and corporate policy.

1.13. Pilot Disability Considerations

Many companies have disability policies for all employees. The flight department manager/chief pilot (FDM/CP) should ensure that the disability policy adequately and fairly covers pilot employees.

If a physical ailment arises that is sufficient to ground the pilot, but not sufficient enough to prevent gainful employment, another position within the flight department or company structure may be the answer. However, a pilot who has no other employable skills may require retraining and may have to adjust to a different job/career and pay structure, possibly outside the company. The disability policy should be broad enough to cover training and outside placement if required.

1.14. Loss of License Insurance

Loss of license insurance also is known as *salary continuance* and provides funds for the short term rather than the long term. Use of loss of license insurance should be coordinated with company human resource personnel. This coverage is subject to change or cancellation depending on loss ratios. NBAA offers a specially designed loss of license insurance program for all Association Members.

1.15. Aviation Department Maintenance Personnel

The following positions may be found in the aviation department. The size of the department and number of aircraft determines the requirement for these positions. As with the flight personnel requirements described in this guide, the following guidelines can be adjusted and adapted to each unique operation, considering number and type of aircraft, number of existing maintenance personnel and their qualifications, previous experience and qualifications of the new person.

MANAGER OF MAINTENANCE

The manager of maintenance reports directly to the aviation department manager or chief pilot. This position usually includes more administrative duties than actual maintenance and repair.

The qualifications of the manager of maintenance include:

- Having broad knowledge of and experience with the maintenance of aircraft of the class, category and type that the company operates
- Holding an Airframe and Powerplant (A&P) certificate and an Inspection Authorization (IA)
- Holding at least a bachelor degree

The responsibilities of the manager of maintenance include:

- Ensuring safe maintenance and line operations
- Supervising maintenance personnel
- Ensuring the quality of aircraft, engine and avionics maintenance and repair
- Assisting with development of department policies
- Assisting with preparation of short- and longrange plans
- Assisting with preparation of the annual operating budget
- Assisting with assessment of aircraft cost studies
- Assisting with establishment of salary structures
- Assisting with establishment of minimum employment qualifications
- Developing assigned personnel to realize their full potential
- Assisting with establishment of performance appraisal procedures and dismissal standards
- Recommending the proper staffing for the maintenance department
- Establishing schedules for periodic inspections, general overhaul, repairs and modifications
- Establishing and maintaining records as required by FARs, manufacturers and company policy

- Monitoring these records, if maintained by an outside agency
- Establishing maintenance safety rules and procedures
- Establishing spares and ground support equipment inventories
- Ensuring that department personnel are thoroughly familiar with company policies, appropriate FARs, pertinent manuals, practices and publications
- Establishing programs for maintenance technician proficiency training, reviews and upgrades, in accordance with FAA and company requirements
- Establishing aircraft handling procedures
- Establishing requirements for hangar space, grounds and a fuel farm, if applicable
- Helping monitor security and environmental affairs, including completing material safety data sheets on all chemicals, fire drills and safety training
- Helping coordinate activities of the maintenance department with flight operations
- Helping ensure that maintenance and flightcrew personnel understand the company's objectives and each other's needs
- Helping provide efficient and timely scheduling of all maintenance and repair
- Directing compliance of minimum equipment list (MEL) maintenance procedures
- Assuming responsibility for maintenance and upkeep of the aviation hangar and office facility

LEAD MAINTENANCE TECHNICIAN/ MAINTENANCE FOREMAN/CHIEF INSPECTOR

The person in this position reports to the manager of maintenance and supervises maintenance technicians.

Qualifications for the lead maintenance technician/maintenance foreman/chief inspector include:

- Holding an A&P certificate and an IA
- Having a background of verifiable practical experience as an active aircraft maintenance technician
- Demonstrating the ability to manage and supervise people
- Holding an associate or higher college degree

The duties of the lead maintenance technician/maintenance foreman/chief inspector include:

- Assisting the manager of maintenance
- Coordinating all aircraft maintenance work
- Coordinating and monitoring all shipping, receiving and inventory

- Ensuring that all work is completed before final inspection
- Overseeing quality controls
- Ensuring that all test equipment is calibrated and maintained
- Ensuring compliance with all Service Bulletins (SBs) and Airworthiness Directives (ADs)

MAINTENANCE TECHNICIAN

A maintenance technician reports to the lead maintenance technician/maintenance foreman/chief inspector, if one is employed, or directly to the manager of maintenance.

Qualifications for maintenance technicians include:

- Holding an A&P certificate
- Holding an associate or higher college degree (recommended but not necessary)
- Having practical experience as an active aircraft maintenance technician with experience in the type of aircraft assigned
- Having completed manufacturer's training in the company's aircraft and powerplant (recommended but not necessary)

The maintenance technician's duties may include:

- Performing inspections, preventive maintenance, troubleshooting and replacement of parts on the aircraft
- Maintaining shop and hangar tools and equipment
- Ensuring compliance with ADs

AVIONICS TECHNICIAN

If the size of the operation warrants it, or the location of the home base demands it, consideration should be given to adding an avionics technician to the staff. This position should report to the lead maintenance technician/maintenance foreman/chief inspector, if one exists, or directly to the manager of maintenance.

Qualifications for the avionics technicians include:

- Holding an FCC Avionics Repairman License
- Holding an A&P certificate (recommended but not necessary)
- Holding an associate or higher college degree (recommended but not necessary)
- Having practical experience as an active avionics maintenance technician
- Having completed manufacturer's training in the appropriate aircraft avionics systems

The maintenance technician's duties may include:

- Performing inspections, preventive maintenance, troubleshooting and repairs as necessary on the company's aircraft avionics system

- Ensuring compliance with all avionics ADs

LINE SERVICE PERSONNEL OR HANGAR ATTENDANT

This person reports to the manager of maintenance or lead maintenance technician.

NBAA recommends that this person hold a high school diploma or equivalent. The duties of this position include:

- Refueling aircraft
- Moving aircraft in and out of the hangar
- Cleaning and restocking the aircraft
- Assisting in routine maintenance
- Assisting in preflight checks
- Assisting passengers in any appropriate manner
- Meeting arriving and dispatching departing aircraft
- Monitoring and maintaining the fuel farm and fuel inventories

1.16. Maintenance Staffing Guidelines

Basic factors that should serve as general guidelines for maintenance personnel staffing are:

- Type and number of aircraft
- Home base location
- Flight route structure
- Utilization rate by hours flown
- Proximity to overhaul and repair facilities
- Supply points for spares

The maintenance department should employ a minimum number of personnel responsible for minor inspections, record keeping, and scheduling and supervising maintenance with a commercial agency. A formula for determining this number is shown in **Figure 1.8**.

STAFFING FOR HIGH-UTILIZATION OPERATIONS

NBAA offers the following additional guidelines on staffing levels to support aircraft maintenance needs for a high-utilization corporate operation. This guidance can be used for planning a start-up, or re-assessing an existing operation. The sample scenario in this section can be modified to address unique operations, challenges and experience.

The end result of this exercise is to establish the minimal required number of full-time equivalent (FTE) licensed A&P mechanics. Depending on administrative requirements, line service requirements or economies of scale from operations, the FTE basis should be increased or decreased based on judgment or additional analysis.

Additionally, age of aircraft, aircraft type/complexity, shop experience and segregation of responsibilities as required

Figure 1.8: Maintenance Personnel Formula

The following formula is provided for determining the number of maintenance personnel required. A constant of four work hours of maintenance per one hour of aircraft flight is used. Each company can revise this number as necessary. The other constant is 1,577 maintenance hours a year per person.

- Work hours a year per maintenance technician: 2,080 (52 weeks per year x 40 hours per week)

- Subtract Hours Not Available:
 - Vacation: 120 (15 days x 8 hours)
 - Holidays: 88 (11 days x 8 hours)
 - Sick leave: 40 (5 days x 8 hours)
 - Training: 80 (10 days x 8 hours)
- Subtotal of hours not available: 328
- Hours available for duty: 1,752 (2,080 hours – 328 hours)
- Non-productive time: 175 (10 percent of 1,752 hours) [Non-productive time includes training, breaks and clean-up time.]

- Total maintenance hours available: 1,577 (1,752 hours – 175 hours)
- Maintenance work hours per one flight hour: 4
- Estimated flight hours per year: 850
- Estimated maintenance personnel hours needed: 3,400 (4 maintenance work hours x 850 flight hours)
- Number of maintenance personnel needed (rounded): 2 (3,400 maintenance work hours/1,577 work hours per year)

by Part 145 repair station and Part 135 operations, and manufacturer technical support responsiveness are other factors that can impact maintenance staffing needs.

Assumptions

- Aircraft are typically utilized for an average of four cycles (flights) per operating day and 1.25 flight hours per flight, resulting in an average utilization of 1,200 flight hours per year, per aircraft.
- Flight operations are scheduled primarily on weekdays only, with weekends off. However, if routinely scheduled, weekend activity should be factored in.
- No flights are scheduled on statute vacation days with historically low load factors (e.g., Thanksgiving or Independence Day), thereby reducing the required potential days to approximately 240 days annually.
- Flight operations may cease during certain major holidays (e.g., Christmas or New Year’s), which are typically periods of low utilization. This time may be used to complete heavy maintenance and annual inspections.
- Vacation and training events should not be scheduled over the winter holidays (e.g., Christmas and New Year’s). Additionally, vacation and training schedules should not create a shortage of personnel or impact the shuttle schedule or maintenance needs.
- Calculations are based on a single aircraft operation; multiple aircraft will result in a closer calculation of manpower requirements.

Process

The analysis has been broken down into a sequence of steps. Each component of this process should be modeled and analyzed individually so that interdependencies can be addressed.

- Step 1: Establish what maintenance activities are planned for completion in-house by maintenance personnel. This will serve as a baseline for the manpower requirements.
- Step 2: Calculate base man-hours associated with routine maintenance activities and periodic maintenance requirements (per manufacturer’s FAA-approved maintenance program; see sample in **Figure 1.9**). A table identifying general maintenance requirements and potential resources that can be used to establish “base man-hours” (BH) is shown in **Figure 1.10**.
- Step 3: Determine an appropriate “margin of error” (E) for task-based man-hour requirements to establish judged man-hours (JH), as follows:

$$BH \times (1+E) = JH$$
 E.g.: One aircraft: $900 \times (1 + .25) = 1,125$.
- Step 4: Determine an appropriate amount of time to add for documentation and paperwork requirements (D) and an appropriate amount of time to add for corrective actions identified during scheduled inspections (CA) to establish primary hours (PH). Note: Corrective actions will likely correlate to age and complexity of aircraft.

$$JH \times (1+ D + CA) = PH$$
 E.g.: One aircraft: $1,125 \times (1+ .35 + .50) = 2,081$.
- Step 5: Determine the amount of labor required to deal with unscheduled maintenance events. This labor need has the greatest degree of uncertainty and will be highly dependant on aircraft type reliability (fleet wide), aircraft age, technician experience, parts availability and the operator’s tolerance of flight delays or cancellations.
 - One- fleet reliability = unscheduled probability.
 - Unscheduled probability x annual flights = estimated events.

Figure 1.9: Sample Manufacturer's Maintenance Program

REFERENCE NUMBER	DESCRIPTION	INT	Manufacturer Estimated Time to Complete	
			Minutes	Hours
32-10-00-220-801-A00	Externally inspect the MAIN LANDING GEAR	5A	12.0	0.20
32-20-00-210-806-A00	Externally inspect the NOSE LANDING GEAR	5A	1.0	0.02
32-20-00-220-801-A00	Externally inspect the NOSE LANDING GEAR	5A	5.0	0.08
53-21-00-220-813-A00	Externally inspect the FUSELAGE components	5A	10.0	0.17
53-31-00-220-808-A00	Externally inspect the FUSELAGE components	5A	5.0	0.08
55-10-00-210-803-A00	Externally inspect the HORIZONTAL STABILIZER	5A	5.0	0.08
55-10-00-210-804-A00	Internally inspect the HORIZONTAL STABILIZER	5A	6.0	0.10
55-20-00-210-801-A00	Internally inspect the ELEVATOR components	5A	6.0	0.10
55-20-00-210-803-A00	Internally inspect the ELEVATOR components	5A	6.0	0.10
55-30-00-210-803-A00	Internally inspect the VERTICAL STABILIZER	5A	5.0	0.08
55-30-00-210-806-A00	Internally inspect the VERTICAL STABILIZER	5A	6.0	0.10
57-21-00-210-801-A00	Externally inspect the WING components	5A	3.0	0.05
57-21-00-210-807-A00	Externally inspect the WING components	5A	1.0	0.02

Figure 1.10: General Maintenance Requirements for Establishing Base Man-Hours

MAINTENANCE NEED	RECURRENCES	RESOURCES
Routine Checks		
Pre-flight	Daily	Management experience, manufacturer input, benchmarking with other operators
Post-flight	Daily	
Line Maintenance		
Aircraft Washing	Varies	Management experience, manufacturer input, benchmarking with other operators
Interior Inspection/Cleaning	Varies	
Ground Equipment/Tooling Upkeep	Weekly/Monthly	
Facility Maintenance/ OSHA Req. Insp.	Weekly/Monthly	Manufacturer task cards, operations experience, regulatory requirements, benchmarking
* Engine Oil Performance (SOAP)	Weekly/Monthly	
* Engine Trend Data Download	Weekly/Monthly	
Specific Weekly/Monthly Inspections (hourly or calendar)	Weekly/Monthly	
Scheduled Inspections		
Hourly	Based on Utilization	Aggregate manufacturer task card estimates associated with individual event, operations experience, benchmarking
Calendar	Calendar Dates	
Cycles	Life limited	
Structural – Corrosion, etc.	Life limited	
*Required for on-condition engine maintenance programs, or as part of engine type certification or maintenance service plans		

- Establish tolerance level (1.0 = 0 tolerance, .95 = 5% tolerance, etc.).
- Add/subtract for “other factors” or anomalies.
- Estimate total man-hours required per unscheduled event; e.g., one aircraft: $(1 - .93) \times 480 \times 1.0 \times .33 \times 2.5 = 166$ man-hours.
- Establish ratio between unscheduled man-hours and preliminary hours: $166 / 2,081 = 8\%$.
- Step 6: Calculate total estimated man-hour requirements per aircraft; e.g., $2,081 \times 1.08 = 2,247$ annual man-hours.
- Step 7: Calculate annual productive man-hours available per maintenance FTE. Available hours will vary depending on vacation and sick day policies, assumed overtime and maintenance training programs.

	Per FTE
Annual Standard Hours Paid	2,080
Overtime (10%)	208
Break Time (15 min. x 2/day)	-125
Lunch	
Sick Leave/Absence (About 5 days/year)	-40
Vacation (2 weeks/year)	-80
Training (5 days/year – recurrent)	-40
Paid Holidays (8)	-64
Other (LOAs – jury duty, reserves, etc.)	-48
Annual Available Hours Per FTE	1,891

- Step 8: Calculate required FTE per aircraft; e.g., $2,247 / 1,891 = 1.2$.
- Step 9: Develop maintenance staff work schedule based on recurrency of maintenance requirements and business needs. The schedule will depend on maintenance task scheduling (every morning, every night, weekends, etc.) and risk tolerance for unscheduled events (i.e., “just in case” labor). It will also depend on the availability of on-demand labor at remote bases of operation that can deal with unscheduled events as required. Adjust FTE per aircraft for schedule constraints, availability of flexible labor and site-specific factors (with site referring to where aircraft is based); e.g., $1.2 + 0.10$ for other factors = 1.3 FTE per aircraft.

Validation

- Review results with NBAA peer operators who conduct business with similar aircraft types and flight schedules.
- Compare resulting maintenance hours to flight hours ratio against manufacturer data and industry publications (e.g., Conklin & de Decker, ARG/US).

E.g.: $(4 \text{ FTE} \times 1,891 \text{ available hours}) / (3 \text{ aircraft} \times 1,200 \text{ FHs}) = 2.1$ maintenance hours per flight hour

- Compare estimated man-hours for scheduled inspections (Step 5) against vendor quotations to complete the same inspection at external labor rates.

1.17. Maintenance Personnel Responsibilities

Smaller aviation departments can perform some of the following responsibilities, and have repair stations perform periodic inspections, annual inspections and engine changes. In larger aviation departments, company personnel perform most or all of these functions.

The following list provides examples of maintenance department responsibilities.

- 100-hour and annual or progressive inspections
- Replacement of accessories
- Airframe repairs
- Replacement of time-controlled items
- Compliance with service bulletins and ADs
- Aircraft fueling and movement
- Preflight and postflight activities
- Interior cleaning and restocking
- Exterior cleaning

At least one of the maintenance employees should hold an IA. Detailed information on the maintenance department can be found in the Maintenance Operations section.

1.18. Maintenance Personnel Records

See both Section 1 (regarding personnel records) and Section 4 of this guide.

1.19. Scheduling

Each company should develop and publish basic scheduling and flight approval guidelines. These guidelines should be disseminated widely to all personnel involved with company transportation.

Guidelines should include a form to ensure that information concerning the desired flight and its approval is communicated clearly. In a company where many executives have the authority to request the aircraft, order of priority should be specified and clearly understood by everyone. An established policy will avoid conflicts. Written request forms reduce misinterpretation of scheduling instructions and allow the department that handles the request more time to work on an itinerary. A sample request form and passenger manifest appears in **Figure 1.11**.

Figure 1.11: Sample Company Aircraft Travel Request Form and Passenger Manifest

Aircraft:		Requested By:		Department:		Date:	
Flight Requested	Date	Time	Flight Confirmed	Date	Time		
Passenger Name, Affiliation and Address		Department To Be Charged	Employee Number	Authorizing Name & Title	Aviation Dept. Confirmation		

NBAA also recommends that the following items be included in scheduling guidelines:

- The titles of all individuals who are permitted to request and/or approve use of company aircraft
- An indication of scheduling priorities
- The titles of those with departmental and final approval authority
- A statement that the aviation department has the final decision-making authority
- A statement that employees who are "problem passengers" could be denied the use of company aircraft
- A policy for non-employees to board company aircraft
- The responsibilities of the centralized scheduling office (which should know of all scheduled maintenance and any related factors affecting the aircraft's schedule)
- A deadline for informing the aviation department of scheduled trips (which will vary depending on the length of the trip)
- A statement of company participation in charity flights

Some companies have a central travel office that processes requests for all modes of transportation. This office either could be in the aviation department or in a separate office. Other companies utilize an outside contracted travel service for transportation services other than the company aircraft, and travel needs are coordinated between the aviation department and the outside service.

The duties of the travel office could include reservations for airlines, car rentals and hotels as well as the company aircraft. If a travel office is used for processing requests for the company aircraft, the aviation department must be granted final approval authority.

For more information about the responsibilities of the scheduler/dispatcher role, see Section 1 regarding aviation department personnel.

1.20. Career Development Training

Initial, recurrent and other training should be made available to, and required of, all aviation department personnel. Specific guidelines for flightcrew training are contained in the Flight Operations section.

Aeronautically oriented personnel tend to think of training primarily in terms of the technical competency and proficiency required to maintain safe and efficient aircraft operations. Although these are important areas, they make up only one dimension of the aviation department assignment.

In order for aviation department personnel to be truly effective, they must support fully the mission of the company in the most efficient and effective manner possible. This support requires a knowledge and appreciation of the company business in terms of cost-effectiveness, operational control and planning for future requirements. All flight department personnel should be trained to understand these and other management concepts of company operations.

Each aviation department member should be encouraged to take courses in basic management, personnel management, planning and accounting. This type of training should be a part of the overall flight-department career-development plan. It is good for the company and will enable flight department personnel to develop long-term career skills. NBAA offers this type of course content through its Professional Development Program (PDP).

As other ways to promote the highest standards of career development and professionalism, NBAA offers the Certified Aviation Manager (CAM) Program and the Standards of Excellence in Business Aviation (SEBA) Program. It also offers career training for business aviation professionals through its Annual Meeting & Convention and its Seminar Program.

A full list of NBAA career development resources is listed online at www.nbaa.org/education.

NBAA CERTIFIED AVIATION MANAGER PROGRAM

NBAA developed the Certified Aviation Manager (CAM) Program to recognize excellence in the field of business aviation and to raise the level of professionalism and quality of management within flight departments. The CAM credential is the ultimate recognition for business aviation professionals.

A Certified Aviation Manager is an individual who has met specified qualifications defined by the CAM Program and has passed the CAM Exam. NBAA, the CAM Governing Board and the business aviation community recognize CAMs as individuals who have reached a high level of industry knowledge, and are qualified and prepared for management roles with business aviation.

The CAM Exam tests knowledge and experience in five subject areas:

- Domain I – Leadership
- Domain II – Human Resources
- Domain III – Operations
- Domain IV – Technical & Facilities Services
- Domain V – Business Management

NBAA and its CAM Governing Board administer the exam qualification and application process, the CAM Exam, and the certification and recertification of those qualified individuals who have passed the exam. Program materials include the *CAM Program Guide and Application* and the *CAM Study Guide*. For more information, contact NBAA at (202) 783-9000 or cam@nbaa.org, or visit www.nbaa.org/cam.

NBAA PROFESSIONAL DEVELOPMENT PROGRAM

NBAA's Professional Development Program (PDP) was developed to prepare business aviation professionals for management roles within business aviation flight departments.

Any person who occupies or aspires to a management position in a company involved with business aviation is a potential candidate. Through the program, an individual can begin preparing for management roles in the flight department while working full- or part-time as a flight department member. Individuals receive recognition for successfully completing PDP-approved courses. For more information about PDP, contact NBAA at (202) 783-9000 or pdp@nbaa.org, or visit www.nbaa.org/pdp.

NBAA STANDARDS OF EXCELLENCE IN BUSINESS AVIATION PROGRAM

In order to encourage and recognize continuing education practices within the business aviation community, NBAA has established the Standards of Excellence in Business Aviation (SEBA) Program. The objectives of this program are to:

- Clearly define industry training standards
- Promote the use of standardized training practices
- Communicate industry best practices
- Support the technical career development programs of business aviation professionals throughout the industry
- Recognize the training accomplishments of NBAA Member Company employees

The SEBA program comprises six categories based on the primary operations disciplines within the business aviation community:

- Fixed-wing flightcrew
- Rotor-wing flightcrew
- Maintenance (including flight technician)
- Flight attendant
- Scheduler/dispatcher
- Ground support

Within each category, various training levels are defined based upon the operational requirements and career progression milestones of each respective discipline. Individual training requirements are defined in each level for the specific training programs required to achieve a knowledge base that equals or exceeds the defined standard. Learn more at www.nbaa.org/seba.

NBAA ANNUAL MEETING & CONVENTION

The NBAA Annual Meeting & Convention provides an unsurpassed opportunity for Attendees to view the largest display of purely civil aviation exhibits in the world. Each year, thousands of people learn about cutting-edge aviation products and services on the exhibit floor, and the NBAA Static Display of Aircraft features a wide range of state-of-the-art business aircraft. More than 100 education sessions teach operational best practices that allow flight departments to be even more efficient, productive and valuable to their organizations.

This gathering of business aviation professionals, where business aircraft management, operations, maintenance, budgeting and products are covered exhaustively, is the single most important business aviation event of the year.

NBAA also offers Business Aviation Regional Forums that target the needs of regional communities, and international exhibitions modeled after the NBAA Annual Meeting & Convention. Learn more about NBAA's Annual Meeting & Convention, Regional Forums and international exhibitions at www.nbaa.org/events.

NBAA SEMINAR PROGRAM

NBAA is committed to informing all business aviation professionals on issues and challenges affecting the community. In support of this effort, the Association offers a comprehensive program of informational seminars for flight department personnel. All job functions, including schedulers, dispatchers, flight attendants, maintenance managers, technicians, chief pilots and aviation department managers, are covered.

Each staff member of the corporate flight department is offered up-to-date information provided by industry experts, NBAA Standing Committees and NBAA Professional Staff.

The NBAA Seminars address current industry trends and issues as well as basic hands-on information for the successful day-to-day operation of the corporate flight department. Payment for each seminar varies. The difference between Member and non-Member fees may be applied to NBAA Membership dues upon submission and acceptance of the appropriate application.

Contact NBAA for an up-to-date seminar schedule, or visit the NBAA web site at www.nbaa.org/events.

NBAA ON-DEMAND EDUCATION PROGRAM

NBAA developed the On-Demand Education Program to provide easy online access to the information business aviation professionals need to keep themselves educated on important industry topics.

The program provides both recordings of select education sessions held during NBAA events and semi-monthly webinars. The latter features subject-matter experts discussing industry hot topics in one or more of the following educational tracks:

- Safety & Risk Management
- Maintenance & Technical Issues
- Airspace & Airport Access
- Aircraft & Flight Operations
- Aviation Management & Aircraft Ownership
- Career & Leadership Development
- Industry Update

The live webinars are interactive and include question-and-answer periods between the audience and the presenters. Following the webinar, attendees are able to review the recorded session to enhance studying opportunities.

NBAA's On-Demand Education allows companies to create team-learning events in their own facilities and also is accessible to small flight departments unable to attend NBAA events in person. For more information, visit www.nbaa.org/ondemand.

1.21. Undergraduate Student Internship Programs

A flight department internship is perhaps the best way to introduce aviation undergraduate students to careers in business aviation, and this arrangement is mutually beneficial. Host companies realize the benefits of opening their doors to young individuals who represent the future of business aviation, while students gain exciting work and a rewarding learning experience in business aviation.

Through internships, students are introduced to the various roles within the flight department and their requirements,

<p>Figure 1.12: Sample Onboarding Agenda, Day 1</p> <p>The following is a sample list of topics to cover on Day 1 of the internship.</p> <p>Human Resources Department Presentation</p> <ul style="list-style-type: none"> • Company documents • Company identification cards <p>Introduction and Training Agenda Overview</p> <ul style="list-style-type: none"> • Outline of onboarding agenda • Mentor and sponsor assignments • Present operations manual • Training log forms (build personal file with copy of application, FAA pilot’s licenses, FAA physical, passport, crew roster form for software) <p>Company Overview</p> <ul style="list-style-type: none"> • Company values and operating principles • Department goals (safe, flexible, reliable, convenient) 	<ul style="list-style-type: none"> • Company aircraft justification and software program • Cost-cutting procedures/new aircraft on order • IS-BAO process • Company structure • Flight department personnel duties <p>Hangar and Office Orientation Tour</p> <ul style="list-style-type: none"> • Introduce aircraft in hangar • Introduce department personnel, give facility tour • Cover gate codes, keys, security system, airport ID badges, • FBO parking sticker, personal business cards • Department mailboxes, reading material, bulletin board, software, e-mail, • Telephone voicemail system, department contact numbers • FBO department and customer service lobby areas 	<p>Your Company’s Flight Department Operations Manual</p> <ul style="list-style-type: none"> • Aircrew dress and appearance • Passenger relations • Aircraft security (unaccompanied baggage policy, passenger verification policy) • Accident procedures (NTSB 830), company emergency response plan • FAA violations and legal considerations (NASA reporting) • Non-company employment • Divulgence of company information (security, pilot trip sheets) • Press relations Airport Identification Fingerprinting • Local airport ID
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as well as the ways in which flight department members interact as a team. Interns can connect classroom theory with current industry practice more easily and gain exposure to the latest aviation technology and trends. Just as important, interns have the opportunity to interact personally with experienced professionals who can provide valuable insight into the flight department’s operations. Exploring their area of study in a real-world environment gives students a special opportunity to evaluate a potential career in business aviation.

Employers from a wide variety of industries indicate that graduates with internship experience are highly attractive potential employees. An intern’s performance is often more professional and such candidates are often able to contribute more effectively immediately upon entry into the organization. In addition, internship hosts often comment favorably that an intern’s enthusiasm for the job can have a positive impact on the morale of the entire flight department. The host organization further benefits from the additional manpower the intern provides.

Company mentors can provide specialized guidance that enhances a student’s aviation education and career develop-

ment. Many companies also view a student’s participation in an internship as a means to screen, select and recruit that student for a future permanent position.

As further guidance, this section provides suggestions for an internship timeline, job description and responsibilities, qualifications and a list of frequently asked questions. See also **Figure 1.12** for a sample onboarding agenda and **Figure 1.13** for a sample intern project assignment list.

TIMELINE

Undergraduate student internships typically are scheduled for a 13 to 15 week commitment with consideration given to the flight department’s schedule and the needs and the academic calendar of the student’s home college/university. The suggested internship timeline is as follows:

- Six weeks prior to expected start date – student applications due to the flight department
- Four weeks prior to expected start date – interviews held for the intern position
- Three weeks prior to expected start date – notification of hire sent to intern

Figure 1.13: Sample Intern Project Assignment List

Fuel Price Tracking and Usage

Description: Recent increases in fuel and oil prices worldwide have a large impact on flight operation expenses. Department policies to increase operating efficiencies that conserve fuel and attain the best available cost at point of purchase help flightcrews, dispatch and management contribute to these cost-saving efforts. Flightcrews have been asked to write the actual posted fuel price on the top of the fuel receipt issued at FBOs where fuel is purchased. Comparing the FBO-posted full-price purchase cost to the actual effective price issued from volume discounts, or other negotiated point of purchase deals, helps define cost savings.

Project Steps: Partner with dispatch to understand the fuel slip postflight process in the company software. In addition, gain an understanding of the existing fuel reports available in the software. Analyze the data and construct various methods of presenting fuel purchase behaviors (savings over retail, etc.). In addition, work with the chief pilot to summarize the details of the fuel programs of providers (FBO fuel programs, specialty fuel programs).

Expected Outcome: This project will familiarize the intern with jet fuel pricing and the importance of aggressive price management for a flight department. Fuel costs account for the largest budget expense line item. This project will enhance the company flight department's ability to present savings activities for supplier negotiation purposes, and to support expense savings initiatives in budget meetings.

Automated Flight Deck Policy

Description: The company operates complex, advanced-technology aviation equipment. HUD, EVS, GPWS, TCAS, FMS, autoflight systems must be managed from standard flight deck operating procedures to enhance safety. The intern will research industry standards for guidelines and assist in the development of standardizing

operating procedures as they pertain to current and projected flight deck automation within company flight operations.

Project Steps: List aircraft flight deck equipment within current fleet and projected replacement aircraft. Using a variety of credible resources (OEM manuals, industry Internet sites, other operators, industry publications, etc.), research and assist in the development of flight deck operating standards. Review current SOPs for alignment with industry standards, and recommend changes.

Expected Outcome: As a review of SOPs for current equipment, this process will provide an independent look at the company's operating practices and their alignment with industry standards. By researching projected equipment, the company gains a preliminary projection of implementation challenges, and alignment of desired training and maintenance programs.

IS-BAO Safety Audit

Description: The company's flight department has been working to align operating procedures with the International Standard for Business Aircraft Operations (IS-BAO). An integral part of this process is the safety audit, which will be used across the operation. This safety audit will proactively identify safety issues that can be addressed to prevent accidents and improve overall safety efficiency.

Project Steps: Identify areas of the flight department that will be evaluated in the safety audit. Use the IS-BAO design manual and the "Your Company Flight Operations" manual to design a safety audit form to collect data and rating system to help interpret the data. Collect data and evaluate the rating system results to identify areas of the company's operation that pose the highest risk factors. Partner with the safety committee and department managers to build strategies to deal with these risks, and track the effects of the implemented solutions.

Expected Outcome: The IS-BAO safety audit will proactively identify risks that exist in the flight depart-

ment operation. The format and content of this program should accurately gather content and evaluate possible risk factors within flight department operations. The intern will be required to work in partnership with the safety committee and department managers to design, implement, interpret and refine the safety audit process.

Program Syllabus Management

Description: The undergraduate student intern program is an opportunity for a student to gain valuable experience and an overall understanding of flight department functions. The intern will become a part of the flight department by contributing input and working on internal projects appropriate to the intern's experience level. The company wants this program to be an enriching and valuable part of the intern's career development, and also to ensure the quality of future intern programs.

Project Steps: Review and provide feedback on the company's undergraduate student intern program. Compare actual experiences to expectations at the start of the program. Review the effectiveness of the entire program from the interview and selection stage, to the "onboarding" orientation, to project completions and trip observation flights. Review the program description and project list for possible revisions that would enrich the experience for the next intern candidate. Candid responses are welcomed and expected.

Expected Outcome: The intent of the company's undergraduate student intern program is to have the intern gain an understanding and appreciation of business aviation flight operations. During the completion phase of the program, the intern should possess the best perspective for current program effectiveness and future program development. Candid feedback on both the positive and negative aspects of the program will help guide the changes that will update and improve the program for the next intern candidate.

- Final day of internship – as arranged (typically a 13 to 15 week commitment)

JOB DESCRIPTION AND RESPONSIBILITIES

The following is a suggested minimum job description for a company to use when advertising its internship program: “This Undergraduate Student Intern position gives a student an opportunity to gain operational experience with respect to business aircraft. The intern will rotate through the various areas of responsibility within the flight department to ensure a well-rounded exposure to all aspects of the department. When applicable, the flight department will provide appropriate documentation to satisfy the college or university requirements for participating in the intern program.”

The company can also communicate that the student will gain first-hand knowledge of business aircraft operations through the hands-on observation (excluding flight deck duties) of all facets of the company flight department. The intern can expect to gain exposure and operational understanding in one or more of the following department areas:

- Flight operations
- Domestic and international flight operations
- Aircraft maintenance
- Aircraft servicing
- Customer service
- Flight attendant operations
- Aircraft scheduling
- Crew scheduling
- Flight planning

QUALIFICATIONS

The recommended qualifications for flight department interns are as follows:

- Undergraduate student enrolled in an appropriate bachelor’s degree program at an accredited college/university as a junior or senior in good standing
- Strong academic credentials (minimum 3.0 CGPA) or strong practical experience or skills. Note: Many individuals who have struggled with academics have excelled in practical tests and tasks.
- Satisfactory disciplinary record (both at school and in the community)
- Academic preparation appropriate to the internship position
- For pilots: commercial pilot certificate with instrument airplane rating
- Proficient in office computer programs such as Microsoft Office (Excel, Word)
- Positive attitude and self-motivated work skills

- Excellent written and verbal communication skills
- Able to provide own housing and transportation during internship

INTERNSHIP PROGRAM FAQs

The following are frequently asked questions (FAQs) about business aviation internship programs.

1. Are undergraduate student interns “employees” of the host organization?

Undergraduate students are generally not considered employees of the host organization, and are generally not eligible for direct compensation or benefits regularly extended to employees. No lasting or commercial benefit is sought or expected by the parties, other than the intrinsic lasting benefit of the work and study experience intended.

2. Are undergraduate student interns paid during the internship?

Some host organizations provide undergraduate students interns with remuneration in some form while others do not – and it is strictly at the discretion of the host organization. It is generally believed that a meaningful work-learning experience is the primary and essential benefit. When remuneration is offered, it is generally in the form of a stipend or scholarship to support the intern’s work-learning experience or to defray expenses related to the experience.

3. What is expected of the host organization during the internship?

The host organizations is expected to assign the undergraduate student intern to duties and work schedules that are both reasonable and consistent with that position for others holding similar positions of responsibility. The host will provide direct effective supervision to the intern to ensure prompt high-quality feedback and opportunity for the intern to resolve any questions and or concerns related to assigned duties and professional growth through the internship. The host will provide a final evaluation to the intern and the intern’s home institution documenting the host organization’s assessment of the intern’s performance during the internship.

4. What can the host organization expect of the intern?

Undergraduate student internships are rich experiences and students are screened and selected by the faculty of the home institution for participation in these experiences. The host organization can expect consistently high-quality work and professional work habits from the intern, and a strong commitment to the host organization’s success in its mission and operations. Undergraduate student interns understand the importance of maintaining the confidentiality of proprietary information and practices and commit to keeping such business information (contracts, projects ideas, work decisions, etc.) strictly private and confidential.

5. What liability is incurred by the host organization during the internship?

The host organization does not incur legal liability for the safety and well-being of the intern beyond that which would be reasonably expected by a visitor or guest. The host organization is obliged to exercise due care for the safety of its operations, crews and passengers and adhere to relevant state and federal safety and other workplace regulations, and it agrees to provide written notification to the intern and the intern's home institution of any special risks to which the intern may be exposed. The student accepts the internship with advance knowledge of such risks.

6. What happens if the host organization is unable to fulfill its obligations?

The host organization is expected to exercise reasonable care in planning for the internship opportunity and to make a good faith effort to fulfill its obligations to provide a meaningful work-learning experience for the scheduled term. Still, unforeseen circumstances or substantial changes to the host organization's operations may preclude completion of the internship experience. The host organization does not incur legal or contractual liability to the intern or the home institution for the completion of the experience beyond a good faith effort.

7. What is the expected work schedule? How much flexibility is there in this schedule?

Undergraduate student internships are generally planned for a minimum of 15 hours/week on average to a maximum of a full-time commitment arranged in advance by mutual agreement between the host organization and the student. The basic work schedule is usually set by agreement and with regard to the intern's other school commitments (if not serving full time in the internship). Flexibility by both parties is very useful in response to variations in the operational tempo of the host organization or especially busy times in the intern's school calendar. Undergraduate student internships are scheduled for a period of about 12 to 14 weeks.

8. How can host organizations identify potential school partners and interns?

Host organizations can identify potential school partners among colleges and universities offering undergraduate degrees in aviation flight operations, aviation management and related disciplines through two key sources:

- The University Aviation Association (UAA) is the professional association of collegiate aviation and home to colleges/universities, individuals and organizations involved in this work. Information on member schools can be found at www.uaa.aero or at the home offices of the UAA.
- The Aviation Accreditation Board International (AABI) is the accrediting organization for collegiate aviation programs. Schools that have earned recognition by this body

have demonstrated that their programs meet high standards for program and instruction. Information on accredited programs can be found at www.aabi.aero/programs.html. Potential intern candidates can be identified by contacting a potential school partner directly. Internship programs often are coordinated by the school's office of career services, which can put host organizations in contact with potential candidates or supervising faculty.

1.22. Security

NBAA recommends that each corporate aviation department have a specific aviation security program. Aviation departments can obtain professional help to determine the best protection methods from local law enforcement, contracted companies, aviation consultants and aviation service providers.

The security program should include plans of avoidance and plans of action. For example, a company might possess an elaborate security system but still might need a plan of what to do if an aircraft is suspected of being sabotaged.

PLANS TO AVOID A BREACH OF SECURITY

The following steps should be taken in developing any security plan.

- Review all sources of media information; newspaper, radio and television coverage of actual events can be very instructive
- Circulate memos, articles and newsletters throughout the company that discuss security
- Review available catastrophe avoidance literature
- Maintain frequent contact with the company's security department. Information gathered on aircraft and flightcrew security should be shared with the security department
- Require that the security and aviation departments attend security seminars
- Consider removal of company identification, logos and the American flag insignia
- Do not publicize the aircraft itinerary
- Have hangar personnel accompany all visitors to hangar facilities
- Avoid having company signs and logos at the company's hangar facility
- Do not make any controversial statements, either in public or in private, since these statements could lead to violence
- Cancel trips or specific stops if there is any reason to suspect trouble
- Be most sensitive to security information received just before flight time
- Use the aircraft's security system at every stop, no matter how brief

- Be very cautious when hiring local guards; local contacts can assist in making arrangements for theft
- Know or require positive identification from passengers
- Require a passenger manifest
- Require all passengers who are not employees to be authorized by an employee
- Check fencing, lighting, security patrols, gates and limited access areas at all airports
- Encourage flightcrews to develop a security awareness attitude
- List any security concerns and actions regarding specific threats
- Request guard services at security-sensitive locations through FBOs or ground handling agents
- Use only reputable catering services and monitor catering carefully
- Advise passengers to maintain positive control of their luggage
- Check all unmarked or unrecognized baggage for content and ownership
- Consider enrolling aircraft in the Block Aircraft Registration Request (BARR) program (www.nbaa.org/barr)
- Receive professional training on the use of any weapon carried on the aircraft
- Use any weapon with caution
- Consider alternative means of transportation if sabotage is suspected
- Verify that no stowaways are aboard, especially in the lavatories or the baggage compartments
- Share any terrorist activity only with company officials, the Federal Bureau of Investigation (FBI) and other appropriate government agencies
- Use security tape on all access panels and doors when parking overnight

In case hijacking or air piracy does occur, the flightcrew must be familiar with published emergency procedures. These procedures are listed in detail in the *Aeronautical Information Manual (AIM)*. Some elements are provided below. They should be followed, providing they do not jeopardize the safety of the flight.

- Execute a distress radio call on 121.5 Mhz or 243.0 Mhz
- Set the transponder to 7500
- Maintain a true airspeed of no more than 400 knots
- Maintain an altitude between 10,000 feet mean sea level (MSL) and 25,000 MSL (providing range requirements are met)
- Fly a course toward the destination that the hijacker has announced
- Comply with any procedures that direct the flightcrew to a safe landing

PLANS TO RESPOND TO A BREACH OF SECURITY

NBAA recommends that aviation departments consider the following steps in developing a company security program.

- Establish an emergency control committee to handle disaster-type emergencies
- Develop a contingency plan for advance response to hijackings, bomb threats, executive abductions, terrorist activities and extortion demands
- Schedule simulated emergencies at least once a year to test the contingency plan
- Establish an emergency communication system with a telephone list of key personnel
- Audit security at hangar facilities and operational areas

The risk of an incident involving hijacking (air piracy) or other terrorist acts exists and is increasing both within the United States and overseas. The following precautions should be taken if a company suspects it may be a target of terrorism.

- Assume that one terrorist act signals the presence of another; if the aircraft is violated in one area, verify that other areas have not been violated
- Ask for help from local authorities, even if terrorist activity is suspected without solid evidence

1.23. Group Executive Travel

The group executive travel policy should derive from corporate philosophy, legal and risk management review, prudence, and a careful assessment of the risks involved should an accident occur that could jeopardize the continuity of executive management. Because of the critical and sensitive nature of this policy, it should be developed by senior management. Corporate risk and insurance specialists also should be consulted.

A policy often begins as a company administrative procedure and eventually becomes part of the company operations manual. However, actual risk and effect of potential losses should be considered rather than allowing protocol or custom to dictate the policy.

The policy should specify executives by title or groups of executives who are prohibited from traveling together. Each policy should include procedures for deviations from the basic policy in extraordinary circumstances. Codes may be used to identify executives for security purposes. Enforcement of this policy should be left to corporate headquarters personnel and not to the aviation department; however

schedulers should point out apparent violation of the policy when trips are being scheduled.

1.24. FAA Violation and Enforcement Procedures

An airman (which includes maintenance technicians, for the purposes of this section) charged with any violation should make a complete report to the aviation department manager as soon as possible. This information should be shared with the company's legal department or counsel.

If the airman desires, a report could be made under the Aviation Safety Reporting System (ASRS). This program, which is described in *FAA Advisory Circular 00-46D*, utilizes the National Aeronautics and Space Administration (NASA) as a third party to receive and analyze Aviation Safety Reports. FAR Section 91.25 prohibits the FAA from using any report submitted under this program in any disciplinary action, with the exception of criminal offenses and accidents.

The company may intercede for any employee charged with a violation if the aviation department manager, or person in charge of a company investigation, determines that the employee acted in good faith and in the best interests of the company. If the employee is found not to have acted in good faith and in the best interests of the company, legal and technical aid may be offered, consistent with company policy.

A violation charge could be the result of an FAA investigation that results from an accident or an incident, a report to the FAA, a report from air traffic control (ATC), or other means. On March 5, 1990, the FAA administrator announced the FAA's action plan to strengthen the FAA/General Aviation Partnership for Safety. In this announcement, the Administrator stated that enforcement would be the last tool used by the FAA to make flying as safe as possible. The other tools addressed by the administrator were good communication, training, education and counseling.

The resulting modifications to the FAA's enforcement policies were issued in FAA Compliance/Enforcement Bulletins Numbers 90-6 and 90-8. These bulletins permit participation in a remedial training program or in voluntary disclosure procedures. The continuing policies of FAA enforcement are administrative action, reexamination, certificate action, civil penalty and criminal action. All seven policies are discussed in this section.

INVESTIGATION PROCEDURES

Anyone can report a suspected or alleged violation to the FAA. When a violation is reported, the FAA assigns an inspector and opens an enforcement action file. A Notice of Investigation is sent to the alleged violator or *respondent*.

No one survives an incident or accident without an emotional toll, and those who pretend not to be upset are perhaps most likely to make an ill-advised statement. Therefore, caution is advised in preparing a response. By

training and inclination, airmen are unnerved by any irregularities and anxious to satisfy official concerns. This alone puts them at a disadvantage when answering questions. Like other people, airmen who believe themselves to be innocent may assume that no harm exists in telling the truth. This kind of "blind" trust is not appropriate, however. In fact, in an effort to respond quickly, an airman may produce answers that are lacking in accuracy, objectivity and thoroughness. Because Miranda protection applies to criminal law and not civil law, airmen often make self-incriminating statements that subsequently appear as part of the FAA's enforcement action case.

For these reasons, airmen and their representatives are advised not to make any statements until the airman has had sufficient opportunity to review the allegations and details of the event in a thoughtful way, and has obtained competent advice and aid from an individual who is familiar with FAA enforcement procedures. Unless served with a subpoena, an airman is under no legal obligation to make a statement to any government official. Therefore, although cooperation with the investigator usually is appropriate, taking these precautions makes good sense. As a general prudential rule, airmen involved in actions with FAA enforcement potential should be represented by competent aviation counsel when being questioned by FAA or NTSB personnel.

When the inspector has assembled the facts and determined a violation has occurred, an Enforcement Investigative Report (EIR) is forwarded to the FAA Regional Flight Standards Office for review. If that office agrees there has been a violation that requires an enforcement action, the report then goes to the FAA's legal counsel with appropriate action recommendations.

FAA ENFORCEMENT ACTION

Airmen must exercise great care in order to preserve the right of being innocent until proven guilty. If an airman suspects that an FAR may have been violated, the event should be reported within 10 days to NASA on the appropriate ASRS form. A copy of NASA's ASRS reporting form may be found on the ASRS web site at <http://asrs.arc.nasa.gov/forms.htm>.

After receiving a letter inquiring about the possible violation, the airman should write back to the FAA and request what information the FAA has so that the airman can respond properly to the inquiry. Once the FAA has responded, the airman can provide the Agency with the date and number of the ASRS report. Be courteous at all times. NBAA recommends that the airman consult an attorney specializing in aviation if the FAA indicates it is pursuing a violation investigation. Under no circumstances should any response be given to investigators without an agreement that anything said or written is without prejudice and will not be used in a trial.

NBAA recommends that the airman request an informal conference in order to listen to and look at the FAA's information. The attorney should do all the talking. An informal meeting may be the cheapest way to get the most information about the evidence the FAA has and what they will try to prove. If there is a clear case for violation, explore the possibility of getting the FAA to offer a compromise civil penalty with no finding of violation instead of taking a certificate action. If these techniques do not work, and you are in the right, you should fight the enforcement action. However, the airman needs to realize that this can be a lengthy and expensive process. Again, representation by competent aviation counsel is essential in ensuring a fair and objective interaction with FAA personnel.

ADMINISTRATIVE ACTION

An administrative action is used to dispose of violations that are too minor to warrant legal enforcement action. In order to be considered minor, the violation must not be deliberate, must not be significantly unsafe and must not evidence a lack of competency and qualification. The violator would be issued either a Warning Notice or a Letter of Correction. These items will remain part of the airman's official record for two years after action is taken.

A Warning Notice, which is addressed to the violator, states that the matter has been corrected and/or does not warrant legal enforcement action. It also consists of the facts and circumstances of the violation incident and a request for future compliance.

A Letter of Correction consists of an agreement with the airman that corrective action has or will be taken in addition to the information in a Warning Notice.

RE-EXAMINATION

If the FAA has reasonable grounds for such a request, the FAA can re-examine the qualifications of an airman (including maintenance technicians). Often a request results from an accident, incident, or violation. This procedure commonly is referred to as a Section 609 ride.

The airman is notified by certified mail of the necessity of the re-examination. Details on the re-examination also could be included. The airman is responsible for arranging a time and place for the re-examination within a specified time frame. If the airman fails or refuses to submit to the re-examination, the FAA ordinarily will issue an emergency order suspending the airman's certificate. If the airman passes the re-examination, the matter usually ends there. If the airman fails, which could occur after multiple opportunities, the FAA will suspend or revoke the airman's certificate. The airman has the right to appeal the suspension or revocation to the NTSB.

CERTIFICATE ACTION

If a violation indicates a lack of technical proficiency or qualification that, in the opinion of the FAA, cannot be remedied

through re-examination or an administrative action, the FAA can suspend or revoke the airman's certificate. Procedural rights for airmen are found in the Federal Aviation Act and FAA Order 2150.3A, "Compliance and Enforcement."

The airman will be informed of the proposed action by a Notice of Proposed Certificate Action. An informal conference could be held with the FAA attorney handling the case. The action could be settled at this conference. If not, an Order of Suspension or an Order of Revocation is issued. The airman has the right to appeal either order to the NTSB. The airman's certificate remains effective until the NTSB disposes of the appeal. However, if the FAA determines that an emergency exists in which safety requires an immediate suspension or revocation, an Emergency Order of Revocation or Suspension will be issued.

The NTSB appeal proceedings are trial-type hearings held before an NTSB administrative law judge. Either the airman or the FAA can make a further appeal to the full five-member NTSB. The airman also has the right to a judicial review before a Federal Appeals Court.

CIVIL PENALTY

The FAA has the authority to assess civil penalties, or fines, for aviation violations. The FAA may propose these fines because investigators and attorneys feel there has been a violation of the regulations.

The airman will be informed of the proposed action by a Notice of Proposed Civil Penalty. An informal conference could be held with the FAA attorney handling the case. The action could be settled at this conference. If not, a Final Order of Proposed Civil Penalty is issued. The airman has the right to appeal.

The appeal proceedings are trial-type hearings held before a Department of Transportation (DOT) administrative law judge, not the NTSB. Either the airman or the FAA can make a further appeal to the FAA Administrator. The airman also has the right to a judicial review before a Federal appeals court.

CRIMINAL ACTION

The prosecution of these cases rests with the Department of Justice and the rules are the same as those for Federal criminal proceedings. These actions tend to focus on serious offenses such as forgery of certificates, falsified log books, carriage of weapons aboard aircraft, false aircraft markings, illegal aircraft registration and illegal fuel tank installation, and knowingly making a false statement on an application for issuance or renewal of a certificate.

REMEDIAL TRAINING PROGRAM

The FAA has begun to permit airmen to complete remedial training as corrective action. Remedial training cannot be used in cases of an airman's lack of qualifications or in cases of an airman's improper conduct that can be considered deliberate and/or grossly negligent, resulted in an accident, or constituted

a criminal offense. In addition, an airman is required to admit to the violation in order to participate in the training program.

If an FAA inspector uses this approach, the inspector will consider the following:

- Will future compliance reasonably be ensured through remedial training alone?
- Does the airman exhibit a constructive attitude that leads the inspector to believe the airman has a willingness to comply, so that noncompliance is less likely in the future?
- Does the airman have any prior record of enforcement actions?

The final decision as to whether or not to use remedial training rests with an Accident Prevention Specialist (APS). The APS will meet with the airman to confirm whether or not remedial training is appropriate, propose a course of study and thereafter develop a remedial training program.

The meeting between the APS and the airman should be limited to a discussion of an appropriate remedial training program to help the airman comply with safety regulations in the future. The merits of the underlying incident or investigation should not be discussed in any other way. The APS should advise the airman that participation in the remedial training program is a substitute for legal enforcement action. The airman cannot contest the violation and participate in the program.

During the meeting, the APS will describe a proposed course of study, including training objectives and expected completion dates. Considerations taken by the APS will include the nature of the violation, the airman's enforcement record, the specific needs of the airman and the availability of qualified instructors and facilities in the airman's geographic area of operation. The airman's views on the proposed course should be solicited before the final program is developed.

The agreed course of study and completion date will appear in a Letter of Agreement. Within the time specified in the agreement, the airman must provide the required evidence that the training has been completed.

A Letter of Correction stating that required remedial training has been satisfactorily accomplished will be placed in the airman's record for two years. After this period, it will be expunged.

VOLUNTARY DISCLOSURE

Procedures for Voluntary Disclosure by Air Carriers can be found in FAA Advisory Circular 00-58.

A certificate holder under Part 121 or Part 135 could voluntarily disclose apparent violations. These operators are encouraged to develop an Internal Evaluation Program. However, voluntary disclosure procedures can be used without an Internal Evaluation Program. If the FAA accepts the voluntary disclosure, the FAA will not seek a civil penalty.

While the voluntary disclosure program is not specifically designed for Part 91 operations, when situations arise similar to those mentioned here, FAA personnel may be approached in a manner similar to the procedures mentioned below. This is especially true when inadvertent non-compliance with an aircraft maintenance and inspection program is discovered. Note, however, that immunity from enforcement action is not assured in these cases.

In order for an enforcement action to be considered under this policy, the following conditions must be met.

- The certificate holder immediately must notify the FAA of the apparent violation upon detecting it and before the agency learns of it
- The apparent violation must be inadvertent
- The certificate holder must take, or begin to take, immediate action upon discovery to terminate the conduct that resulted in the apparent violation
- The certificate holder must develop and implement a comprehensive fix satisfactory to the FAA

Immediately after an apparent violation is discovered, the certificate holder must contact the appropriate principal inspector. The form of notification may be verbal, written, or electronic. The immediacy of the initial notification is more important to the FAA than completeness of the information. The certificate holder should not delay notification and should cover the following items with the principal inspector:

- Brief description of the apparent violation, including an estimate of how long it remained undetected, as well as how and when it was discovered
- Verification that no additional violations occurred after the initial one was identified
- Brief description of the immediate action taken after the apparent violation was identified and the person responsible for taking the immediate action
- Verification that an evaluation is underway to determine if there are any systemic problems and what corrective steps may be necessary to prevent the apparent violation from recurring
- Identification of the person responsible for preparing the comprehensive fix
- Acknowledgment that a detailed written report will be provided to the principal inspector within 10 calendar days

The principal inspector will respond with a written acknowledgment of the certificate holder's initial notification. This acknowledgment includes the request for a written report and serves in lieu of a letter of investigation, provided the written report is completed in accordance with the voluntary disclosure reporting procedures.

The certificate holder should give the written report to the principal inspector within 10 calendar days after the initial notification was made. The report should include the following information:

- A list of the specific section of the FAR that may have been violated
- A description of the apparent violation, including the duration of time it remained undetected as well as how and when it was detected
- A description of the immediate action taken, including when it was taken and who was responsible for taking the immediate action
- An explanation that demonstrates the apparent violation was inadvertent
- Objective evidence that demonstrates the seriousness of the apparent violation and the certificate holder's analysis of that evidence
- A detailed description of the proposed comprehensive fix, outlining the planned corrective steps, designating who is responsible for implementing those corrective steps and a time schedule for completion of the fix
- Identification of the company official responsible for monitoring the implementation of the comprehensive fix

The case will be reviewed by the principal inspector with an assigned inspector/agent. The FAA's review will include the following:

- A review of the certificate holder's enforcement history
- A review of any nationally developed database for similar apparent violations and their respective fixes
- A consultation with other FAA specialists to help determine whether the certificate holder's comprehensive fix is acceptable to the FAA

Upon receipt of the certificate holder's written report, the FAA sends an acknowledgment of receipt to the certificate holder. The provisions of the certificate holder's written report and comprehensive fix proposal will be reviewed to verify whether:

- The descriptions of the apparent violation and immediate action taken are complete
- The analysis of objective evidence supporting the apparent violation adequately addresses whether policy, procedural, control, or other systemic problems exist
- The identified corrective steps of the comprehensive fix should prevent the apparent violation from recurring
- The comprehensive fix defines responsibility and accountability for implementing each corrective step
- A realistic time frame for implementing each corrective step of the comprehensive fix has been established

- A responsible person from the certificate holder has explained how they intend to monitor the implementation of the comprehensive fix

If a proposed comprehensive fix is not fully developed within 10 calendar days, the certificate holder should provide at least an overview of its comprehensive fix plans. A detailed description of the comprehensive fix should be provided within 30 calendar days after the certificate holder initially notified the principal inspector of the apparent violation.

The FAA will cooperate with and assist the certificate holder, as necessary, so that both parties are satisfied with the comprehensive fix proposal. If the proposed fix is deemed acceptable by the principal inspector, a Letter of Correction will be prepared that includes the date at which the comprehensive fix will be satisfactorily implemented, or a later date if the principal inspector agrees to allow for some flexibility in the implementation schedule of the certificate holder's comprehensive fix.

1.25. Company Pre-Accident Plan

Operators must have pre-established clear procedures that will provide direction and guidance in the event of an accident or an incident. The possible occurrence of an accident or incident cannot be ignored in business aircraft operations. These procedures should include regulatory requirements as well as company policy.

Responding to requests from NBAA Members and NBAA's Board of Directors, the NBAA Staff has created a document that provides initial guidance for companies in the event of a business aircraft accident. The memorandum, titled "Company Response to an Aviation Accident," advises company management and public affairs personnel on how to respond to media, public and internal inquiries quickly, sensitively and effectively. It has been reviewed and approved by representatives from the National Transportation Safety Board, Federal Aviation Administration and General Aviation Manufacturers Association. A copy of this memo appears as an appendix to this guide.

ACCIDENT NOTIFICATION

The responsibility to notify a company or business of an aircraft accident in which a fatality or a serious injury has occurred normally is that of the state or local police in the jurisdiction in which the event has taken place. In some instances notification by the police may be delayed. For that reason NBAA recommends that operators establish and maintain a proactive flight following system that will assure the company becomes aware of an event as early as practical.

NBAA recommends that company guidelines delineate who needs to be notified in case of an accident or incident. A pilot of a business aircraft involved in any accident or incident immediately must notify the aviation department manager or, failing that, the executive to whom the department

reports. Procedures should permit such communications to occur at all times. For example, the pilot could have access to a paging system or a telephone number that is answered 24 hours a day, every day.

Section 830.5 of the NTSB regulations requires that the operator notify the nearest NTSB field office in the event of any accident or incident. For specifics as to which accidents or incidents require an operator to notify NTSB, refer to FAR 830.5.

Under the definition of the term *operator* in Section 830.2 of the NTSB regulations, the operator could be the person who “causes or authorizes the operation of an aircraft.” NBAA suggests that the company’s preaccident plan state who should contact the NTSB. The plan should include at least two or more people who are authorized to contact the NTSB and the order in which the responsibility descends. If the first person on the list is not available, the second person will be responsible for this task.

Under Section 830.6 of the NTSB regulations, the NTSB must be provided with the information listed below, if available:

- Type, nationality and registration marks of the aircraft
- Name of owner and operator of the aircraft
- Name of the pilot in command
- Date and time of the accident
- Last point of departure and point of intended landing of the aircraft
- Position of the aircraft with reference to some easily defined geographical point
- Number of persons aboard, number killed and number seriously injured
- Nature of the accident, the weather and the extent of damage to the aircraft, as far as is known
- A description of any explosives, radioactive materials or other dangerous articles carried

ON-SITE PROCEDURES

The flightcrew, if not incapacitated, must assume control of an accident site and the following procedures should be included as their duties.

- Remove all passengers to a safe area
- Secure assistance, render emergency first aid and arrange to provide immediate medical attention for the injured
- Arrange for medical examinations of all passengers, whether injured or not, and secure a physician’s report on each
- Prepare signals, if in a remote area
- Notify the nearest FAA Flight Service Station (FSS)

- Ensure the aircraft and its onboard documentation will not be disturbed until properly released by the FAA or NTSB
- Preserve the integrity of the accident site for investigators; if there are fatalities, notify the local police and coroner
- Obtain names and addresses of eyewitnesses
- Arrange for cargo to be stored, if necessary, pending company instructions for disposition

ON-SITE STATEMENTS

The flightcrew should not make any statements to the authorities or the media until they have had an opportunity to recover fully from shock, review the details of the event in a thoughtful manner and seek competent legal counsel. When involved in an accident or any incident, do not speak to a representative of the media. The corporate public relations specialist should handle the press.

Unless served with a subpoena, the pilot is under no legal obligation to make a statement to any government official. The NTSB accident report should be completed in the time limit set, with the aid of an attorney.

COMPANY INVOLVEMENT

A serious accident will have an instantaneous emotional impact on the corporate family. Established procedures will enable the company to handle most of the matters expeditiously. The aviation department, whether small or large, should coordinate the formulation of acceptable company post-accident procedures. The corporate executive responsible for the aviation department, legal counsel and insurance manager (or insurance agent if the company does not employ an insurance manager), and the public relations officer should be involved in establishing and following administrative procedures. Companies should ensure that:

- Responsibility is delegated to an appropriate company executive to discharge the administrative functions as necessary
- Proper notification has been given to the NTSB and/or FAA (ensure that legal counsel has reviewed procedures and available accident details and is aware of possible legal implications)
- Notification procedures satisfy the requirements of the company insurance carrier

After company procedures have been written, they should be distributed to and understood by executives, the aviation department manager, chief pilot, flightcrew, legal counsel, insurance manager and insurance agent. Copies also should be placed on the aircraft.

PARTIES TO AN INVESTIGATION

The company should request to participate as a Party to an Investigation to help the NTSB develop a complete factual record. This enables responsible officials, whose product or services might be involved, to have immediate access to

accident facts in order to initiate preventive and/or corrective action. Participation as a Party enables a company to learn facts firsthand. The regulations can be found in Part 831 of the NTSB regulations, which contain accident/incident investigation procedures.

If a company is designated as Party to the Investigation it will begin to participate during the investigation's field phase. Later, if a public hearing is deemed necessary by the NTSB, the Board can designate the company as a Party to the Hearing.

PUBLIC RELATIONS

The company's public relations department, if there is one, should prepare to handle press or other inquiries. If no such department exists, a key executive should be prepared to handle external and internal inquiries. Those with public relations responsibilities should help prepare the company's response in advance. The key components of a company's response to an accident are as follows:

- The company's policy statement on the aircraft's use
- Authoritative information on business aircraft accident rates, company flying safety awards and pilot safety records
- Set procedures for handling intercompany relationships if the accident involves an aircraft used under time sharing, joint ownership, or interchange agreements, or when passengers from another company are on board

CARE OF SURVIVORS AND NEXT OF KIN

Much has been learned in recent years about the psychological impact of a traumatic event like an aircraft accident on victims, their next of kin and other people directly and indirectly affiliated with the flight department. NBAA recommends working with trauma intervention specialists to develop effective notification and support processes and resources. Specific areas to address include:

- Development of a Next of Kin notification strategy, process and resources
- Development of processes, procedures and resources for supporting the immediate needs of the Next of Kin (such as a company-family liaison, transportation, financial support, information)

1.26. Carriage of Candidates for the U.S. House or Senate

Due to the passage of the Honest Leadership and Open Government Act in 2007, the Federal Election Commission (FEC) has promulgated new rules governing the private carriage of candidates for federal office. These rules came into effect on January 6, 2010, introducing further restrictions, and in some cases prohibitions on the carriage of federal candidates. The rules also provide a new method for

calculating the reimbursement rate for non-commercial air travel. Reimbursement by candidates is required in order to avoid an in-kind contribution that would exceed permissible limits set by the FEC.

These new rules apply only to individuals meeting the FEC definition of a candidate currently running for federal office. Individuals that are not currently candidates for the U.S. House or Senate are not covered by the FEC rules.

The U.S. House and Senate have also established additional rules for currently serving members, which are explained in a later section.

PROHIBITIONS ON PROVISION OF TRAVEL

The previous regulations, issued by the FEC in 2003, did not specifically prohibit travel on board non-commercial aircraft by any type of federal candidates. The new regulations, promulgated in 2010, now expressly prohibit travel on non-commercial aircraft by candidates for the U.S. House of Representatives. These candidates, their authorized committees, and their leadership political action committees are prohibited from making any expenditure for non-commercial travel on aircraft, unless the aircraft is either government-operated or owned or leased by the candidate or an immediate family member of the candidate.

NEW REGULATIONS ON REIMBURSEMENT RATES

Under the 2003 FEC Regulations, federal candidates were required to reimburse providers of non-commercial air travel according to the first-class, coach, or charter rate between two destinations, depending on the availability of the rates. Under the 2010 regulations, the required reimbursement rates for travel on non-commercial aircraft have changed substantially.

Candidates for the U.S. Senate, vice presidency or presidency are required to reimburse the provider of air transportation for the candidate's pro rata share of the normal and usual charter rate or rental charge for travel on a comparable aircraft of comparable size. The normal and usual charter rate or rental charge is the amount it would cost to charter or rent a comparable aircraft of comparable size for the given distance or time flown.

In most cases, this is calculated by contacting charter operators and obtaining the price for the trip conducted by the candidate in a comparable aircraft operated by the air carrier. A comparable aircraft is an aircraft that has similar physical dimensions and amenities to the aircraft actually flown and is capable of carrying a similar number of passengers.

Under the 2010 regulations, federal candidates are not required to include government-mandated security personnel when determining the comparable size of the aircraft. Also, media and security personnel may reimburse the service

provider directly instead of reimbursing the candidate as was previously required.

NEW RECORDKEEPING REQUIREMENTS

The 2010 regulations require federal candidates to maintain and report certain records pertaining to non-commercial air travel. For example, candidates must file reports with the FEC stating the name of the flight provider, aircraft information and a list of all passengers. Records on the publicly available charter rate used to determine the reimbursement amount must be reported and available to the public within seven days of the candidate's actual travel.

GOVERNMENT- AND CANDIDATE-OWNED AIRCRAFT EXCEPTIONS

Exceptions to these regulations exist for both government- and candidate-owned aircraft. Questions about these exceptions should be directed to NBAA's Operations Service Group at (202) 783-9250 or info@nbaa.org.

CARRIAGE OF MEMBERS CURRENTLY SERVING IN U.S. HOUSE OR SENATE

Members currently serving in either the U.S. House or Senate must follow the ethics rules set by their respective chambers when traveling on board non-commercial aircraft. For House members participating in privately sponsored, officially connected travel, the gift rule prohibits travel on a non-commercial, private or chartered flight, unless exceptional circumstances are demonstrated.

In addition, the House Code of Official Conduct prohibits members from using personal, official or campaign funds to pay for or reimburse the expenses of a flight on any aircraft unless one of the exceptions in the rule is met. The major exceptions are for travel on commercially scheduled flights and flights provided by individuals or companies operating a charter service. However, the use of personal, official or campaign funds to pay for a flight on a non-commercial aircraft is generally prohibited.

Unlike House Members, U.S. senators are not expressly prohibited from utilizing non-commercial aircraft. Under Senate rules, senators traveling on board non-commercial aircraft must provide reimbursement at the normal charter rate or rental charge for a similar aircraft.

There are a number of exceptions and complex scenarios covered in the House and Senate rules that cannot be adequately discussed here. NBAA Members considering transporting U.S. House members or senators are urged to review the rules in detail with qualified advisors.

FAA REGULATIONS, AND STATE AND LOCAL LAWS

In addition to the FEC Rules, candidates and operators must satisfy the regulations of the Federal Aviation Admin-

istration (FAA) and any applicable state or local laws. The Federal Aviation Regulations (FARs) allow operators of non-commercial aircraft to carry federal candidates under FAR 91.321 so long as the service provider does not hold an air carrier certificate.

The FAA requires that the reimbursement provided by the candidate does not exceed the rates required by the FEC regulations. Unlike federal candidates, state and local candidates are governed by state and local laws, not FEC regulations. For this reason, it is recommended to consult appropriate counsel before providing or accepting non-commercial air travel in connection with state and local elections.

1.27. Aircraft Resourcing Options

The flight department manager/chief pilot (FDM/CP) is not just a manager of the company aircraft, although that is one of the most important parts of the management function. As managers of destination resourcing, FDMs/CPs must provide the most effective and efficient transportation mode to meet the mission of the flight department and the company.

EVALUATING TRANSPORTATION MODES

The company aircraft may not always be the most effective or efficient means of meeting the aviation department's transportation mission. Various forms of alternative transportation may better meet particular facets of each mission. The FDM/CP must be able to evaluate alternative transportation modes and justify using – or not using – any of these modes, including the company aircraft, to company management.

The aircraft resourcing options available to companies can be categorized and defined in six ways:

- Whole Aircraft In-House Flight Department – An entity being the only registered owner of an aircraft and utilizing an in-house flight department
- Whole Aircraft Management Company – An entity being the only registered owner of an aircraft and utilizing a management company
- Joint Ownership (In-House Flight Department) – Two or more entities are registered owners of an aircraft and one of the owners operates the aircraft for all owners
- Co- Ownership (Management Company) – Two or more entities are registered owners of an aircraft and use a management company to manage the aircraft for all owners
- Fractional Ownership – Several entities are registered owners of an aircraft, hire a management company to manage the aircraft and allow the management company to exchange this aircraft among their fleet of aircraft

- Charter – A company that provides aircraft and crew to the general public for compensation or hire (profit)

The most common supplemental transportation providers include charter and fractional ownership programs. Although supplemental lift providers may appear to be more expensive per hour or per mile, they may provide a more effective and efficient means of meeting certain transportation objectives.

NBAA maintains an aircraft resourcing options web site at www.nbaa.org/aro. The FDM/CP should become familiar with these tools and be able to provide careful and reasoned answers to company management regarding any of these transportation options. In addition to the financial implications, the FDM/CP should consider the effect these options may have on the following areas:

- Industrial security
- Confidentiality
- Control of schedule, crew training, crew qualifications and maintenance

For more information on the pros and cons of various transportation options see **Figure 1.14**.

CORPORATE AIR SHUTTLE CONSIDERATIONS

Through effective execution, corporate shuttles can realize financial savings, productivity gains and considerable increases in quality-of-life initiatives.

A vital step in initial shuttle analysis is to take a detailed look at the company's travel volume and trends. A partnership with the commercial travel provider is vital to accumulating the necessary data, and it is also through the travel provider that overall company airline contractual information exists (i.e., negotiated fares, present and future market coverage of the airlines). It is important to understand and take into consideration the potential for an increase in company-negotiated airline fares. The volume that is depleted from target markets by the operation of shuttles may underscore contractual segment minimums.

For many, the increase in air traffic coupled with a drastic deterioration of service are real costs that are adding up for companies exponentially. Such costs include missed and cancelled meetings, additional hotel and meal costs, unproductive time waiting in terminals, key employees not traveling when they should, and key employees enduring stress and fatigue when they do travel.

Types of data that substantiate the development of corporate shuttles include:

- Total segment volume in target markets
- Scatter of the segments (seasonal/quarterly, monthly, daily and time of day)
- Ticket fare of target market

- Airline delay and cancellation numbers
- Ground transportation costs
- Anecdotal evidence from travelers and surveys
- Hotel charges (such as if airline travel requires an overnight stay)
- Merger/acquisition of/with another corporation, which would require frequent travel after amalgamation

Once volume is substantiated, various management methods to provide scheduled service exist. The remainder of this section lists the methods used by NBAA Members operating shuttles.

Contracts with Commuter/Commercial Airlines – Listed below are some of the advantages and challenges encountered with this management method.

Advantages:

- Companies that outsource this type of operation use the aircraft and crews from a Part 121 operator. This option allows for a "trial" period without capital outlay; contracts can be established for as little as six months. This short duration also could be utilized as a "proof of concept" tool to further identify potential benefits and actual passenger loads
- It requires a minimum of capital investment
- Certificate owner is in operational control
- Utilization of other operating agreements is established, i.e., fueling, line service and maintenance contracts
- It is a core competency for the management company

Challenges:

- Contracts (of short or long duration) to include notice of cancellation requirements and costs
- Union considerations
- Cost for changes in unanticipated shuttle schedule adjustments
- "Force measure" contract cancellations, such as due to FAA closures or war, or extreme changes in corporation's business health
- Performance goals, such as on-time arrival goals, excluding weather delays

Purchase/Lease of Aircraft with Outsourced Management of the Operation – Listed below are some of the advantages and challenges encountered with this management method:

Advantages:

- Ability to operate services using outsourced firm's certificate
- Certificate owner is in operational control

- Utilization of other operating agreements is established, i.e., fueling, line service and maintenance contracts
- It is a core competency for the management company and enables quick startup
- No administrative/personnel burden
- Economies of scale
- Procedures and systems are in place and operational
- Flight operations are owned by the management firm and business operations are owned by the corporation

Challenges:

- Lack of direct link to the FAA
- Reduced operational control and flexibility
- Lack of visibility and involvement in agreements
- Potential for misalignment in corporate cultures
- Co-employment issues
- Indirect contact/relationship with internal customer decreases service initiatives
- Adaptability to existing business model
- Flight and business contract structure needs to be aligned with clear boundaries
- Contracts are structured to avoid one-way cost accountability
- Shared accountability for risk and liability concerns
- Risk an increase in overall company-negotiated airline fares, depleting volume discounts
- Initial capital expenditure

Purchase/Lease Aircraft with In-House/Internal Management of the Operation – Listed below are some of the advantages and challenges encountered with this management method:

Advantages:

- Total operational control and flexibility (when operating aircraft with a seating capacity of less than 20 and payload less than 6,000 lbs., the ability to operate under FAR Part 91 Regulations)
- Direct contact/relationship with internal customer, increasing service initiatives
- Direct extension of corporate culture
- Economies of scale with existing flight department
- Cross utilization of maintenance and flightcrew with corporate fleet
- Increased quality of life and productivity initiatives
- Operational control of “door-to-door” service package

(parking, flight and ground transportation)

- Ability to add or delete shuttle destinations quickly (easily adaptable to change)
- Feedback/suggestions can be acted upon
- Utilizes company flightcrews and maintenance (company employees)
- Less reliance on outside factory programs (powerby-hour, avionics-by-hour, etc.) with in-house maintenance

Challenges:

- Initial capital expenditure
- Responsibility for internal structure requirements for operational management
- Sole accountability for risk and liability concerns
- Required to set up a flight department to be operated by the corporation (if the flight department is not pre-existing), resulting in increased personnel for corporation
- Requires greater attention to aircraft operating procedures

For more information about corporate shuttle options, contact NBAA at info@nbaa.org.

1.28. Aircraft Operating Costs

NBAA recommends that flight department managers/chief pilots (FDMs/CPs) be familiar with accounting and finance theory and practice and other business subjects to ensure that aircraft operations are represented properly to the company. Accurate and well-maintained aircraft operating cost records should achieve the following objectives:

- Aid in the preparation of budget requests and forecasts
- Provide systematic and timely review of expenditures versus budget projections
- Determine aircraft costs per flight hour, per mile, or per passenger mile, as required by the company
- Reflect aircraft maintenance quality and efficiency
- Provide a basis for evaluating and comparing operating costs between different aircraft models
- Provide a way to allocate costs among the various departments that use or benefit from company aviation services

Direct (sometimes called variable) operating costs and fixed (sometimes called indirect) costs are the two types of costs associated with aircraft operation. A sample aircraft operating costs form is provided in **Figure 1.15**.

DIRECT OPERATING COSTS (DOCS)

Direct operating costs are incurred when the aircraft is operating. These costs include:

- Consumables (fuel and oil)
- Maintenance
- Inspections
- Overhaul
- Parts replacement

These costs may be known and accounted for (receipts are available) or be estimated future expenses. Aircraft DOCs, for chargeback purposes, are either per hour, per mile, or per passenger mile flown. See **Figure 1.16** to see how DOCs are determined.

DOCs usually are charged directly to the user or users of the aircraft, and can be charged to one user or department or prorated among several users. The company sometimes absorbs DOCs, and another appropriate cost is charged to the users (see section below). Users may include departments actually having passengers aboard or may be expanded to include departments that receive benefits of the aviation department activities indirectly.

FIXED COSTS

Fixed costs are incurred whether the aircraft is flying or not. Standard fixed costs are listed below.

Normal overhead expenses include:

- Hangar expenses
- Shop expenses
- Shop equipment expenses
- Depreciation
- Insurance premiums
- Upkeep expenses
- Salaries (including fringe benefits) for all flight department personnel
- Training expenses for all flight department personnel
- Major nonrecurring expenses

Fixed costs are determined by summing all current and expected expenses incurred and dividing by hours/miles/passenger miles to get the fixed cost per hour/per mile/per passenger mile. Fixed costs either are absorbed by headquarters (all or in part) or are distributed among the users of the aircraft. Users may include departments actually having passengers aboard or may be expanded to include departments that receive benefits of the aviation department activities indirectly. Depreciation expense frequently is omitted from aviation department fixed expenses, normally being absorbed as a corporate general and administrative or headquarters capital expense.

Depreciation expenses result from capital expenditures incurred by the flight department. Capital charges are usually larger one-time expenses that meet certain Internal

Revenue Service (IRS) guidelines and generally accepted accounting principles (GAAP) and that are then depreciated over a period of time. Capital expense may be for a new item (additional hangar space, certain maintenance equipment, new aircraft, etc.), or it may be for an addition to an existing capital item that increases value or adds life to the item (remodeling of existing office space, additional avionics, etc.). Book depreciation charged to the flight department for the aircraft capital assets normally should be based either on a salvage value of 70 to 80 percent of the original purchase cost or on a reasonable estimate of the aircraft sales value after a six-year depreciation cycle. Aircraft depreciation charged to the flight department should not be based on tax depreciation, which depreciates the aircraft to a net value of zero. By using book depreciation, the fixed costs per year are lower, so the amount the flight department must pass on to its users is reduced, and it credits the flight department for its care in managing the future sales value of the aircraft.

A major nonrecurring expense is a one-time expense of an unusual nature. These often are expensed items (as opposed to capital) but could be capital. Examples include major equipment installation or overhaul; major facility upkeep, such as roof repair; and premature powerplant overhaul. Capital expenses generally include items or actions that add significant value or extend the useful life of an existing asset. The FDM/CP should seek counsel from company accounting or finance personnel for specific situations.

OPERATIONAL DATA

Some companies prefer to relate the cost of operating the aircraft in terms of cost per flight hour because management readily understands that terminology. Others favor a cost-per-mile analysis because the speed of the aircraft and payload capability may be important factors; the accuracy of this method, however, is not as precise as calculating cost by flight hour due to varying ground speeds. If company records maintain the number of passengers carried on each flight, the cost per passenger seat mile may be determined by using the operating cost per mile as a base.

The FDM/CP should become familiar with and use an aviation computer-based flight data program (such as AvComp). The current AvComp programs available are capable of providing operational data reports in many formats, using all data tracked by the program. This allows flight department management to report many kinds of metrics, including data on flight legs, route city pairs, destination statistics, aircraft operating efficiencies, passenger use data and fuel data.

ALLOCATING AIRCRAFT OPERATING COSTS (CHARGEBACKS)

The company's management needs to decide if the cost of the company aircraft should be allocated internally. If they decide to allocate the cost in this way, they need to show how and where this will be done.

Figure 1.14: NBAA Aircraft Resourcing Options Analysis Characteristics

	Whole Aircraft In-House Flight Department	Whole Aircraft Management Company	Joint Ownership In-House Flight Department
Service Quality	<ul style="list-style-type: none"> • Highest level of control/service possible • Immediate availability likely • If aircraft not available, must use charter or airlines • Best possible confidentiality/security • Maximum control over safety options 	<ul style="list-style-type: none"> • Potentially excellent; customizable • Immediate availability likely • If aircraft not available, must use charter or airlines 	<ul style="list-style-type: none"> • Potentially excellent; customizable • Availability requires coordination and planning • If aircraft not available, must use charter or airlines
Aircraft Administration	<ul style="list-style-type: none"> • Owner/lessee maintains total control over and manages aircraft operations • Personnel on owner's payroll; must deal with in-house personnel issues 	<ul style="list-style-type: none"> • Owner/lessee maintains control over, but delegates management of aircraft operations to management company • Personnel not on owner's payroll 	<ul style="list-style-type: none"> • Owners/lessees maintain total control over and manage aircraft operations • Personnel on owner's payroll; must deal with in-house personnel issues
Crew Quality	<ul style="list-style-type: none"> • Consistent; owner-controlled • Owner controls training of crew and maintenance personnel 	<ul style="list-style-type: none"> • Consistent, owner input, crews assignable • Owner delegates control of pilot and mechanic training 	<ul style="list-style-type: none"> • Consistent, owner-controlled • Owners control training of crew and maintenance personnel
Operating Costs	<ul style="list-style-type: none"> • Variable; utilization-dependent – lowest cost of operation at reasonable utilization levels • Subject to deadhead/positioning expense 	<ul style="list-style-type: none"> • Variable; utilization-dependent • Annual costs may be higher than an in-house flight department (because of management fee) • Subject to deadhead/positioning expense 	<ul style="list-style-type: none"> • Variable; utilization-dependent • Subject to deadhead/positioning expense
Costs Offsets	<ul style="list-style-type: none"> • There may be a charter option to help offset costs 	<ul style="list-style-type: none"> • There may be a charter option to help offset costs • Possible availability of fleet discounts for fuel, insurance and crew training 	<ul style="list-style-type: none"> • There may be a charter option to help offset costs
Liability	<ul style="list-style-type: none"> • Completely liable 	<ul style="list-style-type: none"> • Shared liability with management company 	<ul style="list-style-type: none"> • Completely liable
Tax Consequences	<ul style="list-style-type: none"> • No commercial Federal Excise Tax applicable • Noncommercial fuel tax applies • Maximum depreciation benefit 	<ul style="list-style-type: none"> • No commercial Federal Excise Tax (owners pay noncommercial fuel tax instead) as long as owner maintains possession, command and control of the aircraft • Maximum depreciation benefit 	<ul style="list-style-type: none"> • Owners share tax liabilities and benefits • No commercial Federal Excise Tax applicable • Noncommercial fuel tax applies • Owners share depreciation benefit
Capital Commitment	<ul style="list-style-type: none"> • Higher capital investment of negotiated acquisition cost 	<ul style="list-style-type: none"> • Higher capital investment of negotiated acquisition cost 	<ul style="list-style-type: none"> • Owners share higher capital investment of negotiated acquisition cost
Aircraft Acquisition and Disposition	<ul style="list-style-type: none"> • Can lease or purchase any aircraft at any price • Can select aircraft make/model, interior and exterior • Can choose when to upgrade, downgrade or sell 	<ul style="list-style-type: none"> • Can lease or purchase any aircraft at any price • Can select aircraft make/model, interior and exterior • Can choose when to upgrade, downgrade or sell 	<ul style="list-style-type: none"> • Can jointly lease or purchase any aircraft at any price • Can jointly select aircraft make/model, interior and exterior • Can jointly choose when to upgrade, downgrade or sell

This matrix has been developed to apply universally. Consequently, to best apply to your company, it must be customized to accurately reflect your specific circumstances.

Co-Ownership Management Company	Fractional Ownership	Charter
<ul style="list-style-type: none"> Potentially excellent; customizable Availability requires coordination and planning If aircraft not available, must use charter or airlines 	<ul style="list-style-type: none"> Potentially excellent; more generic Aircraft availability guaranteed at all times, sourced via owned, fleet or charter aircraft Advanced notice required (four to eight hours) More than one aircraft may be available at the same time, depending on contract terms and/or subject to availability Charter aircraft may be substituted for program aircraft Unable to leave equipment and/or personal belongings onboard aircraft 	<ul style="list-style-type: none"> Potentially excellent; more generic Possible inconsistent service vendor to vendor Availability depends on market demand; no guarantee of aircraft availability from any one vendor If aircraft not available, must use other charter vendor or airlines
<ul style="list-style-type: none"> Owners/lessees maintain control over, but delegate management of aircraft operations to management company Personnel not on owner's payroll 	<ul style="list-style-type: none"> Owners maintain control over, but delegate management of aircraft operations to fractional provider (management company) Personnel not on owner's payroll 	<ul style="list-style-type: none"> None, not applicable Personnel not on owner's payroll
<ul style="list-style-type: none"> Consistent, owner input, crews assignable Owners delegate control of pilot and mechanic training 	<ul style="list-style-type: none"> Crew changes likely, rotating from pool May be able to request specific crew or use own crew Owners delegate control of pilot or mechanic training 	<ul style="list-style-type: none"> Crew changes likely, rotating from pool No control of pilot or mechanic training
<ul style="list-style-type: none"> Variable; utilization-dependent Annual costs may be higher than joint ownership (because of management fee) Subject to deadhead/positioning expense 	<ul style="list-style-type: none"> Fixed on a per-hour basis, based upon flight time plus set ground time per operation used to calculate billed usage charges; hours in excess of contract at high cost All fees (including deadhead and positioning charges) except international handling and customs charges included in overall fee structure Higher costs when compared to other forms of ownership at higher utilization levels, or charter at lower utilization levels 	<ul style="list-style-type: none"> Lowest overall cost at minimum usage levels Consistent charges at low utilization rates, subject to negotiated reductions at higher usage levels Subject to ancillary charges; catering, landing, etc. Subject to deadhead/positioning expense
<ul style="list-style-type: none"> There may be a charter option to help offset costs Possible availability of fleet discounts for fuel, insurance and crew training 	<ul style="list-style-type: none"> None applicable 	<ul style="list-style-type: none"> None applicable
<ul style="list-style-type: none"> Shared liability with management company 	<ul style="list-style-type: none"> Shared liability with fractional provider 	<ul style="list-style-type: none"> Passenger not necessarily immune from all liability
<ul style="list-style-type: none"> Owners share tax liabilities and benefits Noncommercial Federal Excise Tax (owners pay noncommercial fuel tax instead) as long as owners maintain possession, command and control of the aircraft Owners share depreciation benefit to the share owned 	<ul style="list-style-type: none"> Owners share tax liabilities and benefits Federal Excise Tax imposed on direct operating costs Owners share depreciation benefit to the share owned 	<ul style="list-style-type: none"> Federal Excise Taxes imposed on charter rate No depreciation tax benefit available as no aircraft are owned
<ul style="list-style-type: none"> Owners share higher capital investment of negotiated acquisition cost 	<ul style="list-style-type: none"> Lower capital outlay equal to a percentage of an aircraft share, which may or may not be negotiated 	<ul style="list-style-type: none"> No capital commitment
<ul style="list-style-type: none"> Can lease or purchase any aircraft at any price Can jointly select aircraft make/model, interior and exterior Can jointly choose when to upgrade, downgrade, or sell 	<ul style="list-style-type: none"> Can lease or purchase Limited to aircraft available via the provider; aircraft purchased may not be aircraft flown No aircraft customization Can choose to upgrade at any time; can choose to downgrade or sell after meeting minimum time requirement or pay penalty A remarketing fee is charged for aircraft disposition May be penalties for early withdrawal from program Lower residual value because of higher hours/cycles; known at purchase 	<ul style="list-style-type: none"> None; no ownership

Figure 1.15: Operating Costs Work Sheet

Fixed/Indirect Costs – Annually

Acquisition Resale	
Purchase/Lease Costs	_____
Finance Expenses	_____
Other	_____
Tax Considerations	
State Sales Tax	_____
Personal Property Tax	_____
Aircraft Registration Fees	_____
Depreciation	_____
Capital Gains (on resale)	_____
International Taxes	_____
Federal Excise Tax	_____
Other	_____
Personnel	
Flight Crew Salaries	_____
Maintenance Technicians	_____
Scheduler/Dispatcher	_____
Accounting	_____
Aircraft Cleaners	_____
Contract Employees (Part Time)	_____
Secretarial	_____
Flight Department Manager	_____
Benefits (estimate 30% of wages)	_____
FAA (crew) Physicals	_____
Company Physicals	_____
Drug Testing	_____
Uniforms	_____
Overtime	_____
Other	_____
Hangar	
Hangar Purchase/Rent	_____
Hangar Finance Cost	_____
Lease Payments	_____
Utilities	_____
Property Tax	_____
Facility Upkeep	_____
Aircraft Support Equipment	_____
Ramp and HazMat Expense	_____
Hangar Security	_____
Insurance	_____
Other	_____
Aircraft Insurance	
Insured Hull Value	_____
War Risk/Vandalism	_____
Liability Coverage	_____
Loss of License	_____
Medical Insurance	_____
(could be covered under Benefits)	_____
Foreign	_____
Other	_____
Training	
Initial and Recurrent Flight Crew Training	_____
Maintenance Personnel Training	_____
Expenses incurred while at training facility	_____
CPR/First Aid/Survival	_____
Human Factor Training	_____
Conferences and Seminars	_____
Other	_____
Maintenance Service Plans	
Computerized maintenance programs	_____
APU	_____

Engine Program/Plan	_____
Airframe	_____
Avionics	_____
Other	_____
Outside Flight Services	
ARINC	_____
Aviation Computer Services	_____
International Handling Services	_____
Fuel Contract Fees	_____
AFIS	_____
Jeppesen Navigation Charts	_____
Other	_____
Aircraft Refurbishment	
Avionics Upgrades	_____
Interior Modification	_____
Paint	_____
Physical Upgrades	_____
Other	_____
Miscellaneous	
Subscriptions/Manuals/Publications	
Maintenance Manual Subscription	_____
Navigation Manual Subscription	_____
Trade Publications	_____
News Publications	_____
Association Memberships	_____
Consulting Fees	_____
Miscellaneous Office Expenses	_____
Office Supplies	_____
Office Equipment	_____
Office Expenses	_____
Other	_____
Other	_____
Variable/Direct Costs – Annually	
Aircraft Operation	
Fuel (block gallons per hour x fuel cost)	_____
Oil	_____
Other	_____
Maintenance	
Labor (associated with a specific flight)	_____
Parts	_____
Freight	_____
Engine Reserves	_____
Restoration Allowance	_____
APU/Reverser Overhauls	_____
MSP (hourly)	_____
Other	_____
Flight Expenses	
Transit Fees	
Landing/handling/parking	_____
International handling	_____
Line Service Fees	
Deicing	_____
Cleaning	_____
Lavatory	_____
Crew Expenses	_____
Navigation	_____
Flight Plans	_____
International Handling Fees	_____
Customs	_____
Catering	_____
SATCOM	_____
Aircraft Supplies	_____
Other	_____
Other	_____

Figure 1.16: Calculating Direct Operating Costs

Direct operating costs (DOCs) are determined by the following process. For the period during which the DOC will be applied (usually January to December, or the company fiscal year):

- Total all current and expected future receipts for:
 - Maintenance
 - Consumables
 - Inspections
 - Overhauls
 - Replacements

- Any other item that can be attributed directly to aircraft use (aircraft phone use, catering, pilot trip expenses, etc.)
- Divide by the hours, miles, or passenger miles flown or expected to be flown, in the period.

The costs may be allocated to all departments or only to those departments or divisions that use the aircraft. The complexity of allocations increases in proportion to the size and complexity of the corporate structure. The method chosen will have some impact on the use of the aircraft. For example, a fully loaded chargeback rate that incorporates both direct and fixed costs will tend to decrease overall use of the aircraft and encourage its use only at executive levels. Chargeback rates that incorporate only DOCs will tend to encourage overall use of the aircraft at all levels of the company unless otherwise limited by policy. Most chargeback schemes share total operating costs between the company and user. The general chargeback principle is that those divisions or users of the aircraft pay an equitable share for its use.

Accounting records should reflect clearly transportation charges to all users of the company. Chargeback rate charges may be made to subsidiary companies or by a subsidiary to the parent company or other subdivisions within the corporation. Although business aircraft that operate under Part 91, Subpart F, are classified as noncommercial for transportation furnished within the corporate structure, the IRS may question the appropriateness of certain charges for taxing purposes. During tax audits, the IRS occasionally has attributed charges for the use of aircraft differently from what the company actually charged, and then based taxes on what, in IRS opinion, should have been charged for aircraft use. For these and other reasons, some companies do not charge individual departments. However, chargebacks based on actual aircraft cost are an acceptable way to account for aircraft cost and use.

Precise accounting is mandatory should the aircraft operate through time sharing, interchange, or joint ownership agreements. Chargeback allocations should be charged against the total travel budget of the entity using the aircraft. Company aircraft operating costs seldom equate dollar for dollar to the cost of an individual airline ticket, and it must be recognized that basic costs for transportation do exist. The dollar-for-dollar difference only can be viewed in its proper context when it is related to time and productivity savings gained through using company aircraft, especially when operating with multiple passengers between airports not served directly with commercial airline service.

ALLOCATION (CHARGEBACK) METHODS

Several methods exist for allocating the costs for company aircraft. The most common are central allocations, direct operating costs allocation, direct and fixed costs allocation, and flat mileage assessment. Each is discussed below. There also are others, but these usually are based on some variation of the above. See also Section 1 for required charges for employee personal use of company aircraft.

Central Allocations – Some corporations consolidate all of the headquarters service costs, including the company aircraft, and divide those costs among all the operating divisions for a central allocation method. There are a variety of formulas used in this method (e.g., a percentage of net sales or a combination of sales, profits and payroll). Each formula has its advantages and disadvantages.

If the company has established a policy for distributing other central service costs, the aircraft probably would fit into the pattern without difficulty. When a division uses the aircraft, there are no costs allocated for a specific flight. Divisions that may have little need for travel or that are limited in use of the aircraft by company policy may resist this method of cost allocation. However, the central allocation approach remains a popular alternative with many companies.

Direct Operating Costs Allocation – Each division that has use of company aircraft is assessed the direct operating costs for a given flight. The company absorbs all of the fixed costs as part of headquarters' operating expense. If several passengers are on board for the same flight from more than one division, those costs may be prorated for each individual, so the cost of the flight is divided proportionately among the divisions.

In some cases, the company also may absorb a portion of the direct operating costs as part of headquarters' expense. This arrangement may stimulate the use of the company aircraft because of the favorable cost factor. Divisions that have a budget to accommodate travel requirements can allocate company aircraft costs against the budget.

Direct and Fixed Costs Allocation – Each division may bear the total cost of operating the aircraft, including costs incurred whether or not the aircraft is flown. Because fixed costs are proportionately higher than out-of-pocket expenses,

this method may discourage use of company aircraft or limit use to divisions that have a substantial transportation budget.

A variation of this method is to charge the user or users of the aircraft the direct operating cost, and charge the fixed cost to the division or operating unit represented by the users. This variation has several advantages. The users bear only the smaller direct cost amount. The division (either a vice president account or division overhead allocation account) bears the fixed cost at a level more tolerant to the larger portion of the total cost, and proportional to the division aircraft usage.

Flat Mileage Assessment – Some companies use a flat mileage assessment of costs. A variation of this is to assess amounts that equate to commercial airline airfares between established airline points of service. The company bears all of the aircraft operating costs in its headquarters account and is compensated in some degree by charges to divisions.

Flat mileage assessment does not depend on commercial service being available between given points. It remains constant no matter where the company aircraft goes. The difficulty with assessing flat mileage rates is that no basis may exist for comparison with airline economy fares. But if the rates are comparable with known scheduled airline mileage rates, the lack of comparison should not present any serious problems.

1.29. Aircraft Insurance

The purchase of insurance protection against financial, damage and injury losses resulting from aircraft and/or airport operation accidents is a decision to be made after thorough discussion with insurance consultants and the company's legal department. The aviation department manager and those responsible for handling the company insurance should remain in close communication during preparations and negotiations for any aviation-related insurance contracts. A brief discussion on the important elements of aviation insurance appears below. For a more thorough treatment of this complex subject, see Appendix A, Aircraft Insurance.

Coverage and/or premiums vary as acquisitions of or modifications to aircraft are accomplished. Changes in flightcrews, changes in routes of travel, changes in operational control and international travel also may affect premiums and coverage. The aviation department manager should know of any restrictions in the insurance coverage, whether related to the flightcrews, their qualifications or any other factors.

The basic coverage in the aviation insurance market are physical damage to the aircraft (hull insurance), aircraft liability insurance and airport liability (premises) insurance.

Physical damage insurance provides for payment to the aircraft owner for physical loss of, or damage to, the aircraft. This usually is written for an amount equal to either the market value, contractually agreed value (loan or lease obligation) or replacement value of the aircraft and covers the interest of both the owner and other persons or organizations who may have a financial interest in the aircraft. This coverage generally is purchased on an all-risk basis. If more limited coverage is desired, such as ground-only or builders risk, it also is available. The following three types of all-risk coverage may be purchased:

- All risk
- All risk not in flight (includes taxiing)
- All risk not in motion (ground only)

Most companies will price entertain requests for "fringe" or ancillary provisions coverage such as extra expense insurance coverage, which provides conditional reimbursement for includes loss of use occasioned by a covered physical damage loss.

AIRCRAFT LIABILITY INSURANCE

Liability insurance coverage is designed to cover the legal liability of the insured to others for bodily injury and property damage resulting from the ownership, maintenance or use of the aircraft. This policy covers coverage legal for defense of any suit brought against the insured, often even if the suit is groundless. Although financial loss, which can result as a consequence of through liability claims, may be may not be as obvious as loss by reason of damage or destruction of an aircraft, it can be much more costly, even in the end, even to the extent of jeopardizing or destroying the company to satisfy liability judgments. Risk of financial loss increases the importance of carrying liability insurance protection consistent with company's risk profile. Basic policy coverage includes the following items:

- Bodily injury liability (excluding passengers)
- Passenger bodily liability
- Property damage liability
- Medical payments
- Guest voluntary settlement (admitted liability)

Risks insured may include liability to third parties arising from (subject to insurance contract or policy conditions, limitations and exclusions):

- An aircraft accident
- A contractually assumed obligation
- Products and/or completed operations liability after resale of the aircraft or upon completion of work
- Use of non-owned, borrowed or rented aircraft
- Owned or leased airport premises where aircraft is located

NONOWNERSHIP AIRCRAFT LIABILITY

Nonownership liability coverage is available as an extension to the owner's aircraft liability policy or as a separate policy. It protects the named insured for liabilities arising from the use of certain nonowned aircraft. The possibility of exposure to liability suits through the use of nonowned aircraft often is overlooked. However, the company may be subject to suits due to bodily injury or property damage if a company or employee, who may be a pilot and operates an his or her own aircraft, or directly (or indirectly through an agent) rents, charters or borrows an aircraft for use by or on behalf of, the organization.

AIRPORT LIABILITY INSURANCE

If the owner of an aircraft also owns or rents hangar, office, lounge or ramp space, the owner should explore the need for airport liability insurance. This type of insurance is designed to cover liability to the public for bodily injury or property damage in and around such areas. In current "broad form" corporate policies, a limited form of this coverage often is included.

WORKMEN'S COMPENSATION AND EMPLOYERS' LIABILITY INSURANCE

Unlike other forms of insurance, the laws of individual states require that workmen's compensation insurance be carried. An insurance agent or broker should be consulted to determine the specific requirements of the state or states. This insurance also protects the employer from employees suits.

Although the standard workmen's compensation and employers' liability policy provides broad protection for the individual operator, endorsements may be requested to cover certain exposures that may not otherwise be covered in the "basic" form (e.g., foreign voluntary coverage or long-shoreman and harbor workers coverage).

INSURANCE UNDERWRITER'S EVALUATION

Insurance companies that specialize in business aircraft insurance are conscious of the many elements that are required to establish a professional corporate aviation department. The complexity of policies and procedures may vary, depending on the operation's size.

In a small operation, for example, a 5- or 10-page company memorandum may be adequate. However, for a multiple-aircraft operation, a complete and detailed operations and administrative manual is desirable. No matter what the size of the operation is, the underwriter will look for written policies and procedures that should be found in the aviation department's flight operations manual. The manual should include management, operations and maintenance policies and procedures.

The underwriter also will review the safety record and accident data for the aircraft make and model.

INSURANCE EVALUATIONS OF MAINTENANCE

The type of maintenance program will may be evaluated by the underwriter based on the following criteria:

- Review of aircraft records
- Compliance with service bulletins
- Compliance with airworthiness directives
- Response to discrepancies on mechanical problems

When maintenance is performed by an outside, FAA-approved repair station, the underwriter will review that facility's experience and qualifications. If maintenance is done in-house, the underwriter will review the qualifications and experience of personnel and available technical support to maintain the aircraft satisfactorily. When a company's maintenance facility is an approved repair station, this is regarded favorably by the underwriter.

1.30. Aircraft Noise

Aircraft noise can be a problem in both large and small communities. NBAA supports being a "good neighbor" to residents who reside near airports. A large component of a good neighbor policy is the level of awareness and respect the business aircraft operator has for the noise sensitivities of residents near airports.

Communities have become more aware of aircraft noise in recent years. One way for a business aircraft operator to be a good neighbor is to form an Airport Friends Committee. A committee of this type can help the local community understand that the airport is a necessary component of the local economy and, in many cases, also is an engine that drives economic activity in an area. Good local community relations are necessary if groups acting in the public interest wish to close the airport, raise real estate taxes, alter zoning and land-use controls, or desire other changes. The *NBAA Airports Handbook* includes information on this concept.

Members of the Airport Friends Committee can include local businesses that rely on aviation, both for passengers and freight. Through participation in this committee, the business operator can let the community see that aviation and airports benefit the entire community.

The noise level generated by an aircraft always should be a factor in the decision to purchase an aircraft. As noted above, communities have become more sensitive to aircraft noise, even that from non-air carrier aircraft.

In 1990, the U.S. Congress passed the Airport Noise and Capacity Act. This legislation requires the DOT to enact rules to phase out Stage 2 airplanes from the contiguous 48 states by December 31, 1999, as well as additional provisions on the approval of noise and access restrictions. NBAA supports the exemption of Stage 2 airplanes with a gross maximum takeoff weight of less than 75,000 pounds from the Stage 2 airplane phaseout rule and from the Stage 2 aircraft noise and access restriction approval process. Even

if Stage 2 airplanes with a gross maximum takeoff weight of less than 75,000 pounds are exempt from the FAA's final rule, the corporate aircraft operator needs to be aware that additional restrictions could be imposed on these aircraft.

1.31. Environmental Concerns

Information about environmental rules and regulations may be obtained from the state in which a Member Company is based. The Federal Environmental Protection Agency (EPA) requires states to establish environmental regulations that are at least as stringent as the Federal rules and to enforce such regulations. The EPA rules cover a wide range of affected areas, including clean air, clean water, storm drain permits, toxic substances such as paint removers and other volatile items, and underground storage tanks. Each state, usually at the state capital, will provide information concerning regulations within the state organization.

Each aviation facility should develop a Pollution Incident Prevention (PIP) and Spill Prevention Control and Countermeasure (SPCC) Plan including a Hazardous Waste Contingency Plan. The type of aviation facility, along with local state laws, will dictate what must be included in these plans. In general, each aviation facility should have an emergency coordinator to handle all emergency response measures. This person will have to be familiar with the following:

- All aspects of the facility's contingency plan and all operations activities at the facility
- The location and characteristics of waste handled
- The location of all records within the facility
- The facility layout

In 1984, Congress responded to the increasing threat to groundwater posed by leaking Underground Storage Tanks (UST) by adding Subtitle I to the Resource Conservation and Recovery Act (RCRA). Subtitle I required the EPA to develop a comprehensive regulatory program for USTs storing petroleum or certain hazardous substances to prevent, detect and clean up releases. At the same time, Congress banned the installation of unprotected steel tanks and piping beginning in 1985.

In 1988, the EPA issued regulations setting minimum standards for new underground fuel tanks and requiring owners of existing tanks to upgrade, replace, or close them by December 1998. Tanks remaining in operation must have leak detection and leak prevention components. UST owners and operators are responsible for reporting and cleaning up any releases. Financial responsibility regulations ensure that, in the event of a leak or spill, an owner or operator will have the resources to pay for costs associated with cleaning up releases and compensating third parties.

1.32. FAR Part 135 for Business Aircraft Operations

Some aircraft operators decide to operate under a FAR Part 135 certificate as opposed to Part 91. There are advantages and disadvantages associated with both arrangements; each operator must weigh its own needs and obligations when making this decision.

The principal advantage of operating under a Part 135 certificate is that an operator then can lease the aircraft to earn a return on the aircraft investment. These arrangements can be especially beneficial and compatible if the aircraft is used infrequently.

Some disadvantages also exist. As a Part 135 operator, the company is a certificate-holding entity in the eyes of the FAA and must comply with specific requirements in regard to paperwork, maintenance and training. As a certificate holder, the operator is subject to additional surveillance from FAA inspectors.

Scheduling flexibility and control are more complex because aircraft are obligated to lease or charter commitments. Insurance, accounting and tax considerations all will change under any lease or charter arrangement. The aviation department manager must check the applicable departments within the company if considering such a move.

1.33. Time Sharing, Interchange and Joint Ownership

Non-commercial business aircraft operations are governed by FAR Part 91. The aviation department should be thoroughly familiar with the regulations. Of particular importance is FAR Part 91.501, Subpart F, which prescribes operating rules for large and turbojet-powered multi-engine airplanes. This regulation also specifies in greater detail how turbojet and large business aircraft may be used.

In general, the regulation covers all normal corporate aircraft operations provided that no charge, assessment, or fee is made for transportation in excess of the cost of owning, operating and maintaining the aircraft. As long as aircraft use is within the corporate structure, the corporation may charge its legally constituted subsidiaries/divisions/affiliates for use of the aircraft. Additional operational requirements are imposed under Subpart F.

NBAA has been granted an FAA exemption that permits its Member Companies that operate aircraft weighing less than 12,500 pounds to be able to operate under Subpart F on a voluntary basis. Under the exemption, time sharing and interchange agreements only are valid between Members of NBAA. More information on the exemption can be obtained from NBAA.

A company that enters into one of these agreements should discuss the agreement with its insurance carriers to ensure that appropriate and adequate coverage is included. A discussion with the FAA Regional Counsel also should be included to ensure that the agreement meets all of the FAA's requirements.

TIME SHARING

Time sharing (FAR 91.501(c)(1)), allows the owner to wet lease their aircraft (i.e., lease an aircraft with crew) while limiting cost recovery to a stipulated *per flight* list of costs items, according to FAR Section 91.501(d).

In addition, leases under time sharing agreements are subject to the mandates of the FAR Section 91.23 "truth-in-leasing clause requirement in leases and conditional sales contracts."

A written agreement or lease must be mailed to the FAA within 24 hours of execution. In addition, the operator must notify the local Flight Standards District Office (FSDO) 48 hours prior to the first flight. The FAA requires that a copy of the agreement is carried on board the aircraft.

While the FAA considers time sharing a noncommercial operation, the IRS disagrees and views time sharing as a commercial operation with tax consequences. A company considering time sharing should consult with its tax department or consultant and perform a thorough analysis of the tax liabilities. Companies considering this practice should perform a careful cost-per-mile computation and compare those costs with what can be recovered.

INTERCHANGE

Interchange agreements allow two aircraft-owning companies to exchange use of their aircraft, according to FAR Section 91.501(c)(2). The exchange must be made on an hour-for-hour basis. However, if there are dissimilarities in aircraft types and use that could cause a cost differential, the difference in cost can be made up with limited compensation (FAA Council opinion, August 17, 1990). Leases under interchange also are subject to the mandates of the FAR Section 91.23 "truth-in-leasing clause requirement in leases and conditional sales contracts."

Interchange and time sharing appear to be similar in most situations. The choice between the two depends upon whether or not (1) the other party has a suitable aircraft and (2) an exchange of time for time is acceptable to both parties, with allowance for the difference in expenses between the two aircraft. Again, as in time sharing, interchange agreements are considered commercial for tax purposes.

JOINT OWNERSHIP

Under joint ownership, which is under FAR Section 91.501(c)(3), two or more companies are permitted to jointly own and use an aircraft under mutual agreements.

Each of the parties to a joint ownership agreement must appear as a registered owner on the FAA certificate of registration. The charges paid by each of the parties are to be set forth in the agreement. A true joint ownership is considered noncommercial for tax purposes.

1.34. The Internal Revenue Service and Excise Taxes

Any operation of an aircraft within the United States is subject to any variety of taxes. If an operation is considered noncommercial for Internal Revenue Service (IRS) purposes, the operation is subject to fuel taxes. Commercial operations, as defined by the IRS, are subject to the transportation of persons tax, the transportation of property tax, and/or the international head tax. If an operation is considered commercial for tax purposes, the operator is entitled to a refund of all fuel taxes paid on aviation fuel (excluding the Leaking Underground Storage Tank tax and the Deficit Reduction tax), since the commercial excise taxes and the noncommercial fuel taxes are mutually exclusive. (IRC 4261)

When determining what operations are commercial and noncommercial, it must be noted that the Federal Aviation Administration (FAA) and the IRS do not necessarily agree on what constitutes a commercial operator.

The FAA defines a commercial operator as a "person who, for compensation or hire, engages in the carriage by aircraft in air commerce of persons or property." To test whether an operation is for "compensation or hire," determine if the carriage by air is merely incidental to the person's other business or is, in itself, a major enterprise for profit. (FAR 1.1)

The IRS defines a commercial operator as anyone in the "business of transporting persons or property for compensation or hire by air." [IRC 4041(c)]

Although these two definitions sound similar, the FAA allows the noncommercial (Part 91) operator to receive some compensation for flights conducted under Federal Aviation Regulation (FAR) 91.501 Subpart F if the operation is "merely incidental" to the business of the company. These operations include time-sharing, interchange and demonstration flights. These operations are considered noncommercial to the FAA. However, the IRS does not distinguish between operations that are "merely incidental" and those that are a "major enterprise for profit." In fact, the IRS has a Revenue Ruling which states that the FAA's definition of commercial aviation is not determinative in deciding which tax applies. (IRS Revenue Ruling 78-75)

Another aspect to consider when determining which tax applies in a situation is who has "possession, command and control" of the aircraft. The FAA uses the phrase operational control, which translates as the "exercise of authority over initiating, conducting and terminating a flight." However,

the IRS determines who has possession, command and control by using the following criteria:

- Who owns the aircraft
- Who has control over the aircraft's personnel
- Who pays the operating expenses of the aircraft
- Who maintains the liability and risk insurance for the aircraft (IRS RR 55-215)

For more detailed information, see the *NBAA Federal Excise Tax Handbook*.

1.35. Non-Business Use of Employer-Provided Aircraft

From time to time, a company's aviation department will be asked to fly employees for reasons not related to the business of the company. The chief executive officer may request the aircraft for a personal trip, or an employee may hitch a ride on a flight already planned to a certain location. Both of these are known as personal use of an employee provided aircraft. NBAA has guidance on this use of the aircraft via its Tax Issues web site at www.nbaa.org/taxes.

Under IRS regulations (Title 26 of the Code of Federal Register or CFR), such transportation may be taxable to the employee. The applicable sections are Section 1.61-21T of the IRS regulations, which apply between 1985 and 1988, and Section 1.61-21(g) of the IRS regulations, which apply after January 1, 1989. These regulations are complex and require the aviation department manager to consult with the company's legal, tax and accounting departments or consultants. The fundamentals underlying the IRS regulations are stated below. The employee has received a service of value.

- The "fair market value" of the service can be determined.
- A receipt of the service constitutes additional compensation as an employer-provided fringe benefit subject to income tax.
- The regulations include rules to determine when transportation is taxable and how its fair market value is determined.

WHEN FLIGHTS ARE TAXABLE

The fair market value of a family member or guest's transportation is considered additional income to the employee. The regulations generally do not distinguish between personal use and empty-seat transportation.

An exception is found in the seating capacity rule, which states that if 50 percent or more of the regular passenger seating capacity of the aircraft on that flight is used for business reasons, then any remaining seats used by employees, spouses and children traveling for nonbusiness reasons can be considered to have a valuation of zero. For the purpose of computing the number of passenger seats, the following seats cannot be counted: (1) flightcrew seats

and (2) seats that cannot be used legally during a takeoff and will not at any time be used during takeoff. However, the regulations further state that the regular passenger seating capacity of an aircraft is the maximum number of passenger seats that have at any time been on the aircraft (while owned or leased by the employer).

A company can reduce or increase the seating capacity of an aircraft permanently. However, if the company then restores some seats within 24 months, the IRS will ignore the reduction in seating capacity.

The regulation applies to the following individuals:

- An employee
- A person formerly employed by the employer
- Any partner who performs services for a partnership
- An employee's spouse
- An employee's dependent children
- A retired employee
- An employee separated from service due to a disability
- Surviving spouse of a retired employee
- Surviving spouse of an employee separated from service due to a disability
- An individual who is less than two years of age

An employee guest who is not categorized above may not be valued at zero. The guest may be valued as if he or she is a non-control employee, even if the employee who brings the guest is a control employee. (The terms control employee and non-control employee are defined below.)

TYPES OF EMPLOYEES

Under the IRS regulations, employees are divided into two types: control and non-control. An explanation of each follows.

Control Employees – A control employee is defined as:

- A board- or shareholder-appointed, confirmed, or elected officer of the employer, limited to 1 percent of all employees or 10 employees (whichever is less), not including an employee whose compensation is less than \$50,000
- An employee whose compensation, as reported on the employee's W-2 Form for the prior calendar year, equals or exceeds the compensation of the top 1 percent of the most highly paid employees, limited to a maximum of 50 employees, but does not include an employee whose compensation is less than \$50,000
- An employee who owns a 5 percent or greater equity, capital, or profit interest in the employer
- A person who is a director of the employer

A control employee also may be a former control employee who performed one of the following actions:

- Left the company within the past three years
- Left the company after reaching age 55
- Had compensation that was not less than \$50,000

Non-Control Employees – Non-control employees are those who do not meet the definition of a control employee. Different definitions apply when the employer is a government employer.

HOW FLIGHTS ARE VALUED

The value of a flight deemed taxable under the regulations can be computed two ways.

The first method, according to IRS regulations, is by reference to how much it would cost a hypothetical person to charter the same or comparable aircraft for the same or comparable flight. The cost to charter the aircraft must be allocated among all employees on board the aircraft based on all the facts and circumstances. This method of valuation is known as charter rate valuation or facts and circumstances. In many cases, this method will result in the higher of the two valuation methods allowed.

The second and more common method is known as the noncommercial flight valuation rule, or SIFL (Standard Industry Fair Level) rule, and involves use of a mileagebased computation known as the Aircraft Valuation Formula (AVF). This formula is a sliding scale of multipliers based on the maximum gross takeoff weight of the aircraft and the type of employee. The following table lists the relevant aircraft weights and their applicable aircraft multiple.

Aircraft Maximum Certified Takeoff Weight	Aircraft Multiples	
	Control Employee	Non-Control Employee
6,000 pounds or less	62.5	15.6
66,001 to 10,000 pounds	125	23.4
10,001 to 25,000 pounds	300	31.3
25,001 pounds or more	400	31.3

Other special considerations include the SIFL rates, which represent an airline industry statistic maintained by the DOT. SIFL rates include specific cent-per-mile rates for three different ranges of statute mileage and a fixed terminal charge. The SIFL rate changes every six months.

Proper use of this special rule precludes the IRS, at some time in the future (usually at audit), from questioning the means by which the value of nonbusiness use of an employer-provided aircraft is derived. This safeguard is not involved when the charter valuation method is used and thus, in many cases, provides substantial benefit over the charter method. However, if the IRS determines that the special rule was improperly used, the taxpayer loses the ability to use the special rule to compute the value of a flight and may instead be forced to use the charter valuation method.

CONSISTENCY RULES

As stated above, use of the special rule for determining the value of taxable transportation is subject to certain restrictions.

The regulations state that the special rule cannot be used to value a flight under either of the following circumstances:

- A person who claims to be a control employee is not recognized as a control employee by another control employee or the employer
- The aircraft's weight class is higher than what had been originally claimed

The same is true regarding use of the seating capacity rule. If a determination regarding the transportation of a control or a non-control employee made under the rule is later found to be in error, it subsequently may not be used to value the flight in question.

The regulations maintain that if an employer or employee determines that a flight is not taxable by virtue of having a business purpose and such determination is later found to be in error, the employee may not value the transportation through use of the special rule.

Under the regulations, once a taxpayer is found to have lost the ability to use the special rule to value the taxable transportation, the taxpayer may be forced to use the charter valuation method.

Finally, the regulations provide that only one valuation method – charter or special rule – may be used to value taxable transportation during a taxable year.

1.36. Bona-Fide Security Concerns

Section 1.132-5(m) of the IRS regulations maintains that a bona fide business-oriented security concern must be demonstrated in order for the employee to realize a reduced valuation for the employee's transportation. The following factors should be considered when demonstrating the existence of such a concern to the satisfaction of the IRS:

- Death threats
- Threats of kidnapping or serious bodily harm
- A history of violent terrorist activity in the relevant geographic area

However, the regulations also state that no bona fide business-oriented security concern will be deemed to exist unless the employee's employer establishes an overall security program with respect to the employee involved. An overall security program is one in which security is provided to protect the employee on a 24-hour basis.

The regulations do provide that if a business-oriented security concern exists with respect to an employee, such concern exists with respect to the spouse and dependents of the employee as well. When an employee's spouse and

dependents fly on board the same aircraft as the employee for bona fide business-oriented security reasons, the requirements for a security program are considered to be satisfied independently with respect to the spouse and dependents of an employee.

Under the safe harbor rule, if, for a bona fide business-oriented security concern, the employer requires that an employee travel on an employer-provided aircraft for a personal trip, the employer and the employee may exclude the excess value of the aircraft trip over the safe harbor airfare from the employee's gross income. The value of the safe harbor airfare is determined under the noncommercial flight special valuation rule by multiplying the applicable cent-per-mile rates and the number of miles in the flight by an aircraft multiple of 200 percent and then adding the applicable terminal charge.

1.37. State Aviation Taxes

State and local governments generate significant revenue from business aviation by imposing a number of different kinds of taxes on aviation assets and operations. These taxes may include income or franchise taxes, sales and use taxes, property taxes and registration fees, employment taxes and unemployment taxes, taxes on fuel and parts, service taxes and other excise taxes.

STATE TAX PLANNING

Planning for state and local taxes in the business aviation arena raises special challenges, and failure to adequately plan for state taxes can be extremely costly for business aircraft owners and operators.

NBAA's web site contains a number of resources describing state and local taxes and articles discussing general state tax issues as well as issues unique to individual states. In particular, the Association's online State Aviation Tax Report summarizes information for each state with respect to the following issues:

- Sales and use tax rates and exemptions
- Fuel tax rates and exemptions for jet fuel and aviation gasoline
- Aircraft registration fees
- Personal property tax

Updated annually, the report is provided in summary format and includes references to state laws and regulations under which such taxes are promulgated. Since NBAA's tax references are necessarily general in nature, they are no substitute for the advice of legal and tax advisors addressing a specific set of facts and circumstances.

1.38. Outsourcing

Knowing when not to outsource is relatively easy. You do not outsource, or compromise, strategic advantages. A strategic advantage is anything that separates you from your competitors and uniquely delights your customers. It may be technology, a process, or a relationship. You use your resources to create and keep your strategic advantage. You use other people's resources to free up your strategic resources.

Outsourcing (full- or part-time) is an advantage under the following conditions:

- Demand for services grows so rapidly that they cannot be accommodated internally
- Demand for services fluctuates dramatically and internal resources are scarce or constrained
- Demand for services occasionally exceeds internal capacity
- Demand for services is seen as temporary
- The technology of the services is beyond the company's objectives or core knowledge
- External services are readily available locally
- External services can be provided as a net reduction in delivery cost
- Constraints on capital make it easier to pay for services on a per-unit basis

1.39. Demonstrating the Value of Business Aviation

It is within the scope of the flight department's responsibility to demonstrate the value of the business aviation function both internally and externally. This can be achieved by partnering with appropriate individuals in the corporate office who may have access to some information you need, and who may be involved in decisions impacting the flight department.

Effectively demonstrating the value of the business aviation function starts with good governance in the form of an aircraft usage policy that is approved by the company's board of directors. Passenger use of the business aircraft then must follow the policy.

The next step is to document key performance metrics that are tailored to your flight department. The strategic metrics will be the intersection of your company's strategic goals and how the business aircraft helps the company achieve those key objectives. Your colleagues may not be able to share specific objectives with you. However, by working with those individuals to identify the reasons your company uses business aviation, and providing them with relevant data, the flight department can create a system that will allow your company to track exactly how the business aircraft helps passengers achieve the company's business objectives.

The next step is to retain the records appropriate, so when asked for the data, it is available on a moment's notice. No one knows when a reporter or a board member may ask for an explanation of why the company has a business aircraft.

Therefore, an internal and external communications plan must be developed so that key individuals throughout the company, including passengers, corporate communications, finance staff and others are able to articulate why your company relies on business aviation for growth and success.

1.40. References for Administration

This section lists additional references Members may access for more information. NBAA publications may be downloaded or requested via the NBAA web site at www.nbaa.org.

If essential references are missing from this list, contact NBAA at info@nbaa.org.

Department Staffing

Industry Database

- NBAA Member Directory, www.nbaa.org/directory

Pilot Logbooks

Federal Aviation Regulations

- Section 61.51: Pilot Logbooks
- Section 61.56: Flight Review
- Section 61.57: Recent Flight Experience: Pilot in Command

Salaries and Fringe Benefits

Publications

- *NBAA Compensation & Benchmark Survey*

FAA Violation and Enforcement Procedures

Advisory Circulars

- 00-46D – Aviation Safety Reporting Program
- 00-58 – Air Carrier Voluntary Disclosure Reporting Procedures

FAA Orders

- 2150.3A – Compliance and Enforcement Program
- 8300.10 – Airworthiness Inspector's Handbook, Vol. 2, Chapters 210–214
- 8700.1 – General Aviation Operations Inspector's Handbook, Vol. 2, Chapter 55: "Inspect an Executive/Corporate Operator," Chapters 180–184

Federal Aviation Regulations

- Part 13 – Investigative and Enforcement Procedures
- Part 61 – Certification: Pilots and Flight Instructors

- Part 63 – Certification: Flightcrew Members Other Than Pilots
- Part 65 – Certification: Airmen Other Than Flightcrew Members
- Part 67 – Medical Standards and Certification
- Part 91 – General Operating and Flight Rules
- Part 119 – Certification: Air Carriers & Commercial Operators
- Part 135 – Operating Requirements: Commuter and On-Demand Operations

Company Pre-Accident Plan

Publications

- NBAA's Company Response to an Aviation Accident (see Appendix)
- *NBAA Business Aviation Fact Book*, published annually
- *FAA Aeronautical Information Manual*

Regulations

- 49 CFR: Parts 100–179 – Department of Transportation Hazardous Materials Regulations
- 14 CFR: Part 830 – NTSB Notification and Reporting of Aircraft Accidents or Incidents and Records; Part 831 – Accident/Incident Investigation Procedures; and Part 845 – Rules of Practice in Transportation; Accident/Incident Hearings and Reports

Carriage of Elected Officials, Including Candidates

Federal Aviation Regulations

- Part 91.321 – Carriage of Candidates in Federal Elections

Other Regulations

- 11 CFR – Federal Elections: Part 114 – Corporate and Labor Organization; Section 114.2 – Prohibitions on Contributions and Expenditures; Section 114.9 – Use of Corporate or Labor Organization Facilities and Means of Transportation; and Part 115 – Federal Contractors

Aviation Safety and Security

Web Sites

- NBAA Safety Information – www.nbaa.org/safety
- NBAA Safety Management System Information – www.nbaa.org/sms
- NBAA Security Information – www.nbaa.org/security
- Department of Homeland Security – www.dhs.gov
- Federal Aviation Administration – www.faa.gov/about/initiatives/sms/
- National Transportation Safety Board – www.ntsbt.gov/aviation/aviation.htm
- Southern California Safety Institute – www.scsi-inc.com

- University of Southern California, Aviation Safety and Security Program – <http://viterbi.usc.edu/aviation>
- Embry-Riddle Aeronautical University – www.ec.erau.edu

Publications

- FAA's *Aeronautical Information Manual*
- NBAA's *Business Aviation Insider*, published bimonthly and online at www.nbaa.org/insider
- *NBAA Update*, published weekly and online at www.nbaa.org/update
- NBAA Flying Safety Awards Rules & Regulations, published annually

Advisory Circulars

- 120-92A – Safety Management Systems for Aviation Service Providers

Aircraft Noise

Advisory Circulars

- 36-1H – Noise Levels for Certificated and Foreign Aircraft
- 36-2C – Measured or Estimated (Uncertificated) Airplane Noise Levels
- 36-3H – Estimated Airplane Noise Levels in A-Weighted Decibels
- 36-4C – Noise Standards: Aircraft Type and Airworthiness Certification
- 91-36C – VFR Flight Near Noise-Sensitive Areas
- 91-53A – Noise Abatement Departure Profile
- 150/5020-1 – Noise Control and Compatibility Planning for Airports

FAA Orders

- 5190.6A – Airports Compliance Handbook

Federal Aviation Regulations

- Part 36 – Noise Standards: Aircraft Type and Airworthiness Certification

ICAO Documents

- Annex 16 – Environmental Protection: Volume 1: Aircraft Noise and Volume 2: Aircraft Engine Emissions

Publications

- *NBAA Airports Handbook*, www.nbaa.org/airports
- NBAA Noise Abatement Program, www.nbaa.org/quietflying

Time Sharing, Interchange and Joint Ownership Agreements

Advisory Circulars

- 91-37A – Truth in Leasing 120-12A – Private Carriage Versus Common Carriage of Persons or Property

- 91-38A – Large and Turbine Powered Multiengine Airplanes, Part 91, Subpart D
- 120-12A – Private versus Common Carriage

FAA Orders

- 8700.1 – General Aviation Operations Inspector's Handbook, Vol. 2, Chapter 57: "Process an Aircraft Lease Agreement for Regulatory Compliance Under FAR Sec. 91.54"
- 8720.1A – Truth in Leasing Notification

Federal Aviation Regulations

- Part 91 – General Operating and Flight Rules: Section 91.23 – Truth-in-Leasing Clause Requirement in Leases and Conditional Sales Contracts and Subpart F – Large and Turbine-Powered Multi-engine Airplanes

Publications

- NBAA Aircraft Operating & Ownership Options web site, www.nbaa.org/admin/options
- NBAA Regulatory Responsibilities and Safety Guidelines for Fractional Aircraft Owners and Fractional Aircraft Program Managers (see Appendix)
- *NBAA Aircraft Operating & Leasing Package*
- *NBAA Federal Excise Tax Handbook*
- *NBAA State Aviation Tax Report*
- Internal Revenue Service Market Segment Specialization Program (MSSP) – Aviation

Non-Business Use of Employer-Provided Aircraft

Publications

- *NBAA Personal Use of Employer-Provided Aircraft*

Web Sites

- NBAA Personal Use Calculator – www.nbaa.org/personal-use

Regulations

- 26 CFR – Internal Revenue: Section 1.61-21(g) – Taxation of Fringe Benefits
- 26 CFR – Internal Revenue: Section 1.132-5(m) – Working Condition Fringe

State Aviation Taxes

Web Sites

- NBAA State Aviation Tax Report – www.nbaa.org/taxes

Demonstrating the Value of Business Aviation

Publications

- No Plane No Gain E-Valuation Toolkit, an online presentation that explains how to develop an aircraft use policy, track and retain appropriate performance records, and create an internal and external communications plan, www.noplanenogain.org

- “Business Aviation: An Enterprise Value Perspective” by NEXA Advisors, two-part study released in 2009 and 2010
- “The Real World of Business Aviation: A Survey of Companies Using General Aviation Aircraft,” by Harris Interactive, October 2009

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2. FLIGHT OPERATIONS

2.1. Flight Operations Personnel Certificates, Ratings and Training

A professional pilot must maintain a level of proficiency that will ensure the pilot's ability to operate the aircraft and cope with emergency situations.

Each aviation department manager, chief pilot, or designee is responsible for maintaining adequate records and follow-up files on all maintenance checks, permit and required certificates, licenses and currency requirements for flight-crew and personnel.

Any flightcrew member delinquent in any required certificates or licenses, currency requirements, flight checks, or training, including FAA medical examinations, should be suspended from flying duty until the requirements are met.

Business aircraft operators should require that the pilot in command hold an airline transport pilot (ATP) certificate and that other pilots hold at least a commercial certificate with an instrument rating. FAR Part 61.31(a) requires that the person acting as pilot in command of a turbojet airplane, an airplane over 12,500 pounds maximum gross takeoff weight, a helicopter that requires an ATP certificate, or an aircraft specified by the administrator, hold a type rating in that aircraft.

The FAA also has a specific policy for certain type ratings that are not found in the FARs. FAA Order 8700.1 includes information for pilots who apply for a type rating in an airplane that is permitted to be operated without a person designated as the second-in-command. Although few of these airplanes are in service (an example is the Cessna Citation 501), business aircraft operators need to be aware of this.

A pilot who applies for a type rating in such an airplane has two options. Under the first option, the pilot can receive the type rating without any limitations. However, the pilot is required to demonstrate single-pilot competence on the practical test. Under the second option, the pilot can receive the type rating with a limitation that reads "second in command required." In this case, the pilot is not required to demonstrate single-pilot competence. The limitation can be removed by demonstrating single-pilot competence on a practical test.

The aviation department manager needs to know whether or not the pilot in command holds any limitations on the type rating and what those limitations are.

2.2. Crew Training

A professional pilot's level of proficiency is not subject to compromise. A pilot's proficiency will greatly affect the

individual's ability to operate an aircraft safely. A continuous training program is necessary to provide proficiency. Pilots should receive at least an annual proficiency flight check. This is required under FAR Part 61.58 for the pilot in command in the operation of an aircraft that requires more than one pilot. However, the pilot in command is encouraged to complete a check every six months. These check flights may be administered by a person authorized by the FAA Administrator, such as a designated pilot proficiency examiner.

NBAA recommends using third-party training vendors or in-house trainers as long as the trainers have the most current information and knowledge.

PILOT TRAINING PROGRAM GUIDELINES

Each business aircraft operator should develop a training program for its flight operations personnel to ensure that the flightcrew is familiar with, and competent in, the assigned duties of their positions. The following guidelines can be used to accomplish annual training in a one-time comprehensive review session, or as part of a progressive schedule that spreads training throughout the year. The training program should consist of initial and recurrent training in the appropriate areas for each crewmember in the aircraft operated or maintained by the company.

The minimum training and testing requirements for Part 91, Part 125 and Part 135 operators can be found in Part 61 of the Federal Aviation Regulations. A business aircraft operator that desires to maintain air carrier standards is encouraged to use the training and testing requirements in Part 121, Part 135 or Part 91, Subpart K as guidance.

Some business aircraft operators have pilot training and testing performed at a pilot school certificated under Part 141 (Pilot Schools), or Part 142 (Training Centers). The FAA certifies these schools and some have exemptions to use simulators for all or portions of the training and testing. Training facilities, simulators, aids and materials should provide an appropriate learning environment to meet the operator's requirements. Qualified and current instructors and evaluators must be available to conduct the training and evaluation.

DOT and Part 135 regulations require that hazardous materials training be given for all new hires and for those changing job functions, and that recurrent training be given every 24 months.

NBAA recommends that recurrent training be accomplished every 6 to 12 months at a reputable training center. Training schools can be found in the products and services listing of NBAA's *Member Directory*.

MINIMUM REGULATORY STANDARDS

Minimum regulatory standards are those regulations that cover the requirements for issuing pilot certificates and ratings and the proficiency of flightcrew, as well as those training requirements specific to the operational needs of

different missions. The following list contains those items that each flightcrew member should have or be able to obtain to be considered “legal” to fly airplanes or rotorcraft under Part 91 of the Federal Aviation Regulations.

- Pilot Licensing
 - Commercial (Airline Transport Pilot preferred)
 - Instrument
 - Multi-engine (if applicable)
 - Land, sea (as applicable)
 - Airplane, rotorcraft (as applicable)
 - Aircraft specific type rating (FAR Part 61.31, 61.63)
 - Biennial flight review, or pilot-in-command check (FAR Part 61.58, Part 125.287 and 125.291, Part 135.297)
- Medical certificate
 - Class (1st, 2nd, or 3rd)
 - Frequency (as applicable)
- Recency of flight experience
 - Day – takeoffs and landings
 - Night – takeoffs and landings
 - Instrument currency and instrument competency check
- Second-in-command training requirements
- High-altitude endorsement
- Jet transition course (if transitioning from turboprop or rotary-wing aircraft)
- FCC radio license (international operations)
- Part 91 requirements (if applicable)
- Part 91 Subpart K requirements (if applicable)
- Part 125 requirements (if applicable)
- Part 135 requirements (if applicable)
- International operations training (if applicable); RVSM, MNPS
- Required navigation performance (RNP) – en route and approach/departure procedures (if applicable)
- Domestic reduced vertical separation minimum (DRVSM) training (if applicable)
- FAA and company training requirements for use of supplemental help
- FAA and company training requirements for cross training (various category or type aircraft)
 - If applicable, meet the requirements of the company for pilot experience and proficiency for use on two or more different pieces of equipment. The company should be aware that pilot proficiency decreases if the

pilot is assigned to more than two aircraft and that this practice should be discouraged.

- Rotorcraft-specific training
 - Helicopter IFR procedures, to include: helicopter ILS procedures, helicopter point-in-space approaches, GPS approaches to heliports
 - Chart and flight orientation of specific heliports and airports
 - Helicopter route charts and operations in high-density airspace (Class B)

ADVANCED CREW TRAINING

Advanced flightcrew training is training that is considered above and beyond the regulatory requirements of the FAA. It also covers different segments of training that would be considered best practices by the NBAA. The following topics cover areas that have been recommended in the past, in addition to training for the new and emerging technologies that are appearing in business aircraft. The minimum course content and frequency of initial and recurrent training has been specified where applicable. Much of this training can be taught by external training providers, consultants, or manufacturers. If the expertise and time exist, personnel within a flight department can also teach much of this training.

Crew Resource Management Training

Crew resource management (CRM) is the effective use of all available resources – human resources, hardware and information – to ensure safe and efficient flights. NBAA recommends that every crewmember be trained in, understand and apply CRM philosophies and standard operating procedures (SOPs). This training should include the flight attendant and flight engineer positions when utilized. Whenever possible, dispatchers, maintenance personnel and all others connected with flying operations should be encouraged to attend CRM training. Most commercial training programs include CRM as part of the aircraft-specific curriculum; however, stand-alone programs also are available. The NTSB, NASA and the FAA strongly support CRM. Information on CRM and training recommendations can be found in Advisory Circular 120-51B, titled “Crew Resource Management Training.”

Special FAR 58, the Advanced Qualification Program (AQP) was published in 1990. It provides an alternate method for qualifying, training, certifying and otherwise ensuring the competency of flightcrew members, cabin crew, aircraft dispatchers, instructors, evaluators and other operations personnel subject to the training and evaluation requirements of Part 121 or 135.

Initial – NBAA recommends that the flightcrew member receive CRM training during initial flight training. It should include but is not limited to:

- Pilot skills and command responsibilities

- Standard operating procedures (SOPs)
- Crew coordination
- Cockpit communications
- Cockpit/flight attendant communications
- Cockpit/flight engineer communications
- Cockpit/passenger cabin communications
- Company policies
- Controlled flight into terrain (CFIT)

Recurrent – NBAA recommends recurrent training for CRM once every two years. Some commercial training programs include integrated CRM training as part of their regular training curriculum. Stand-alone programs also are available commercially.

Weather, Weather Radar and/or Stormscope Training

Severe weather avoidance and the use of weather radar and/or stormscope procedures are an integral part of a safe and efficient flight operations department. Several commercial vendors as well as manufacturer programs are available to assist in implementing a training program.

Initial – As soon as practical, flight departments should establish a training program that includes but is not limited to:

- Weather theory
- Weather reports/forecasts
- Weather radar operations and limitations
- Windshear/microburst avoidance procedures
- Stormscope operations and limitations
- Company policies and procedures
- Specific radar/stormscope model training

Recurrent – NBAA recommends recurrent training every two years. Many commercial vendors will incorporate wind-shear training during recurrent simulator sessions.

First Aid, CPR and AED Training

First aid and cardiopulmonary resuscitation (CPR) training for flightcrew members is a crucial part of a safe and efficient flight department. This training can be accomplished in house or through outside commercial vendors, as long as it is conducted by a nationally recognized CPR/automated external defibrillator (AED) program, such as the American Heart Association or American Red Cross, and meets local/state AED guidelines.

Initial – Flight departments should establish a training program that includes but is not limited to:

- Basic first aid focused on business aircraft
- CPR certification
- AED training (if applicable)

- Bloodborne pathogens training that meets the requirements of OSHA's Part 1910-1030 (Occupational Exposure to Bloodborne Pathogens: Final Rule) and training for other infectious diseases that are relevant for regions to be overflown
- In-flight medical emergencies
- In-flight medical kit use
- Remote medical telemetry equipment (if applicable)
- Therapeutic oxygen use (if applicable)

Recurrent – NBAA recommends annual training. Be advised that certain states of registry require more frequent recurrent training for the use of automated external defibrillators.

Emergency Training

FAR Part 91 does not contain detailed requirements for flightcrew emergency training. FAR Part 91.505(b) does state that before beginning a flight, each required member of the crew shall become familiar with the emergency equipment installed on the airplane to which that crewmember is assigned and with the procedures to be followed for the use of that equipment in an emergency situation.

FAR Parts 125.271, 125.319 and 135.331 provide a more detailed list of items to be included in a training program for emergency training. This list of items is a good reference for all business aircraft operators to use. There are several ways a business airplane operator can meet the following emergency training requirements. An aviation department may want to provide this training using internal personnel with training knowledge or they can obtain professional help from contracted companies, aviation consultants and/or aviation service providers. They should provide emergency training in the areas outlined below.

Initial – The following areas of emergency equipment and emergency situations are to be completed by required crewmembers prior to beginning a flight on the airplane to which the crewmember is assigned.

Training should include individual instruction in the location, function and operations of at least the following emergency equipment:

- Portable hand fire extinguishers, with knowledge of the classes of fires and appropriate extinguisher to use for each
- Location and operation of all emergency exits
- First aid kit and related inventory lists
- Normal and emergency use of oxygen system by crew and passengers
- Overwater operations equipment to be used in ditching and evacuation, if appropriate
- Life vests and their operation for adults, children and infants
- Life rafts

- Pyrotechnic signaling device
- Survival kit
- Personal protective equipment (i.e., smoke hood), if applicable
- EVAS, if applicable

Initial emergency training also should include training on emergency procedures as described in the aircraft flight manual, including but not be limited to the following:

- Authority of the pilot in command
- Crew duties and responsibilities
- Passenger handling, including handicapped passengers and other passengers requiring special care
- Review of aircraft accidents and incidents
- Fire inflight or on the ground
- Smoke control procedures with emphasis on electrical equipment and related circuit breakers found in cabin areas
- Emergency evacuation, planned and unplanned
- Operation of all emergency exits
- Rapid decompression
- Ditching and evacuation
- Illness, injury, or other abnormal situations involving passengers or crewmembers
- Hijacking and other unusual situations
- Aircraft wing contamination

Crewmembers who serve in operations above 25,000 feet must receive instruction in the following:

- Decompressions: slow, rapid and explosive
- Respiration
- Hypoxia
- Duration of consciousness without supplemental oxygen at altitude
- Gas expansion
- Gas bubble formation
- Decompression sickness
- Physical phenomena and incidents of decompression
- Hyperventilation

Recurrent – A review of emergency equipment on board your aircraft should be completed on an annual basis. A review of emergency situations such as ditching, smoke and survival should be completed on a biannual basis.

The review of emergency equipment should include, but not be limited to:

- Individual instruction in the location, function and operations of at least the following emergency equipment:
- Portable hand fire extinguishers, with knowledge of the classes of fires and appropriate extinguisher to use for each
- Location and operation of all emergency exits
- First aid kit and related inventory lists
- Normal and emergency use of oxygen system by crew and passengers
- Overwater operations equipment to be used in ditching and evacuation, if appropriate
- Life vests and their operation for adults, children and infants
- Life rafts
- Pyrotechnic signaling device
- Survival kit
- Personal protective equipment (i.e., smoke hood), if applicable
- EVAS, if applicable
- Instruction in emergency assignments and procedures, including coordination among crewmembers
- Review of aircraft accidents and incidents involving actual emergency situations and information provided in the *Aeronautical Information Manual*

Each crewmember should perform at least the following emergency drills, using the proper emergency equipment and procedures:

- Ditching and unplanned water landing, if applicable
- Planned and unplanned emergency evacuation
- Fire extinguishing and smoke control
- Operation and use of emergency exits
- Use of crew and passenger oxygen
- Removal of life rafts from the aircraft, inflation of the life rafts, use of lifelines, and boarding of passengers and crew, if applicable
- Donning and inflation of life vests and the use of other individual flotation devices, if applicable

Some companies provide basic emergency procedures training for executives who fly frequently on the company aircraft. This training includes such items as emergency evacuation, smoke environment and use of basic emergency equipment

Security Training

The type and amount of security training that your organization provides crewmembers will depend on the type of

missions flown and the destinations frequented. Internal company security personnel or external aviation service providers, contracted companies or aviation consultants can provide this type of training.

Initial – Flight departments should establish a security training program that includes but is not limited to:

- Appropriate TSA 49 CFR Part 1500 regulations
- Appropriate TSA 49 CFR Parts 1540 and 1544 regulations
- Review of security incidents or events
- On-board aircraft security system
- Internal company security plan
- Development of a security-awareness attitude
- Plan to ensure that all access panels and doors have not been tampered with when parked overnight
- Hijacking or other terrorist acts
- Bomb threats
- Electronic communications security
- Information provided in the *Aeronautical Information Manual (AIM)*

Recurrent – Security training should be reviewed by crewmembers on a biannual basis. A security training program should include, but not be limited to, a review of those items outlined in the initial security training program. It also should include:

- Review of security incidents or events
- Any changes in the internal company security plan
- Review of high-risk areas of the world

International Procedures Training

International operations require extra procedures and vigilance above what is required for domestic operations. Operators should complete a course of training before attempting any international operations. Several commercial vendors can be found in the products and services listing of the *NBAA Member Directory*. In addition, the International Operations section of this Management Guide has a comprehensive list of procedures for international operations.

Initial – As soon as practical but before commencing international operations, a training program should be completed that includes at least the information available in Section 3 of this guide. In addition, use of a commercial vendor should include instruction in the latest airspace and country restrictions and regulations, such as Europe's Joint Aviation Regulations for operations (JAR-OPS). Training also should include procedures for use of augmented crews and long-range flight, if applicable. Documentation of training is required for several international operations, such as RVSM.

Recurrent – NBAA recommends recurrent training every two years. Training should include those items covered in initial training and any current changes in procedures and/or airspace.

Advanced Cockpit Aircraft Training

As flight departments acquire advanced cockpit airplanes or upgraded avionics equipment, SOPs should be examined in order to make effective use of the new equipment resources and maintain a safe operation. Previously established operating guidance for IFR flight may be inadequate for the use of modern avionics systems. CRM and crew communication practices merit special consideration in the advanced cockpit. NBAA's published guidelines for managing the cockpit of advanced aircraft is titled *NBAA Automated Flight Deck Training Guidelines*, and it includes training objectives for initial course instruction.

Initial – Initial training should include the guidelines published by NBAA. In addition, company procedures should be developed and training should be provided using operations manuals to cover all the equipment installed on the advanced aircraft (i.e., TCAS, EGPWS, minimum equipment lists, etc.).

Recurrent – Recurrent training should be progressive and include review and instruction on:

- The proficient operation of the aircraft at all four levels of automation
- CRM, crew briefings and communications using the advanced equipment
- Mode awareness
- Crew compliance with limitations and procedures contained in the AFM supplements and the flight operations manuals
- Latest advances in procedures and equipment (i.e., precision runway monitoring, data link procedures, etc.)
- Use of FMS/GPS for departure, enroute, arrival, holding, approaches and missed approaches

FAR, AIM and Miscellaneous

Knowledge of the Federal Aviation Regulations, *Aeronautical Information Manual*, and various other miscellaneous sources of information for the safety of flight are critical pieces of a safe and efficient flight department. The department should have access to and be trained on the use of these documents as well as the inclusion of these resources in the flight operations manual and SOPs. Commercial vendors can accomplish some of the training but most of the training can be accomplished in house.

Initial – Initial training should include but is not limited to:

- Federal Aviation Regulations pertinent to the company operations
- Basic aerodynamics and flight performance

- Aircraft systems review
- Aircraft weight and balance
- Icing/deicing procedures
- Navigation charts
- Minimum equipment lists
- Air traffic control procedures
- *Aeronautical Information Manual* (AIM)
- Physiology of flight
- Flight operations manual
- Standard operating procedures (SOPs)
- Company procedures

Recurrent – Recurrent training should occur on an annual basis and can be accomplished at set intervals throughout the year or on a progressive basis. It should include but is not limited to a review of all the initial topics with emphasis on changes since the last training.

Rotorcraft-Specific Advanced Flightcrew Training

Operators of rotorcraft should consider the following topics as areas for additional training for flightcrew.

Initial – Initial training should include but is not limited to:

- Federal Aviation Regulations pertinent to rotorcraft operations
- Turbine transition training, if transitioning from reciprocating rotorcraft
- Noise-abatement awareness, to include methods for attaining information at area airports and heliports
- Factory and manufacturer education programs, i.e., Sikorsky, Bell, Allison Engines, etc.
- Safety
- Main/tail rotor safety
- Wind conditions conducive to flapping situations
- Hearing conservation
- Known hazards at airports and heliports

Upset Recovery Training

Operators of fixed-wing aircraft should consider loss of control in-flight training, also known as upset recovery training, as another training area for flightcrew. This training can be completed in a simulator or appropriate aircraft and usually combines both classroom and aircraft/simulator instruction.

2.3. Crew Fitness and Health

NBAA recommends that aviation departments establish a physical fitness educational program to keep their personnel in good physical and mental health. The physical

condition of the crew is as important as the condition of the aircraft. Guidelines for crew health should include:

- A policy that allows a flightcrew member to not fly for health reasons
- Information on the effects of over-the-counter medication
- Suggestions for a balanced diet
- Provision for adequate rest
- Suggestions for regular exercise
- Information on the recognition of stress

Unlike in an office environment, where a person can perform many duties with minor ailments, the flight environment requires that the flightcrew member be physically fit. FAR Part 61.53 prohibits a pilot from flying if medically unfit. Cabin crew members should adhere to the same medical guidelines as those followed by the flightcrew.

DIET, EXERCISE, REST AND STRESS

The lifestyle of many crew members includes eating quick meals at airport restaurants, waiting in pilot lounges and working irregular duty hours.

The crew should be encouraged to select balanced meals. A dietitian could provide guidance on how to eat nutritious meals while on the road. If catering is used on a flight, meals should be included for the crew. However, each crew member should be provided with a different meal, in order to lessen the chances that all crew members become ill of food poisoning should a given meal be contaminated.

Some business aircraft crews spend hours waiting in airport lounges. Some fixed base operators (FBOs) have exercise facilities available, but these usually are found only at larger facilities. Company guidelines could encourage crews to try to walk or perform other moderate exercise while they are waiting. Adequate rest is another factor that contributes to a crew member's health. Guidelines on duty time and flight time limitations as well as minimum rest requirements are imperative. Details on flight and duty time considerations appear in the following section.

Due to the variety and number of demands, stress is a major factor in a business aircraft crew member's life. Although some stress enables the crew member to remain alert and ready to accept fast-paced and unusual situations, too much stress can degrade performance and present a safety hazard. The cumulative effect of stressful situations that occur within an individual's family life, interpersonal relationships, company associations and flight operations may have an adverse effect on a crew member's performance. All crew members should be watched for indications of too much stress and cautioned to practice self-observation for excessive stress.

The following suggestions on how to mitigate high stress in the cockpit come from a study from the Aviation Research and Education Foundation:

- Use SOPs to eliminate much of the uncertainty and many of the misunderstandings that occur during a busy flight
- Concentrate on flight operations exclusively
- Have adequate fuel and alternate plans for any anticipated problems
- Accept stress for what it is
- Reduce tension within the cockpit environment to reduce stress and increase efficiency, but maintain organization and discipline
- Use a “compartmentalization” process whereby the critical problems at hand command 100 percent of a pilot’s attention and all unrelated (personal) problems are put aside
- Perform comprehensive crew briefings and coordination to keep uncertainties to a minimum
- Mentally review the entire flight to help general preparation and possibly reduce unanticipated problems
- Develop a mental prestart checklist to focus attention solely on flight-related items
- Get physical exercise and sufficient rest
- Pay attention to details and keep a safe pace
- Conduct proper briefings at the proper time
- Involve the flightcrew to develop a team effort

According to a study by Richardson Management Associates in Montreal, an element that contributes to the way people react is the choice of one, or a combination of, behavioral compulsions called drivers. The general heading for these drivers are:

- Be perfect – The person is never satisfied with his- or herself, his or her achievements, or with others
- Be strong – The person has to be self-sufficient
- Hurry up – The person experiences relief with activity
- Please everybody – The person feels uncomfortable unless everyone is happy
- Try hard – The person typically puts energy into trying instead of doing

Situations appear where these drivers are necessary. However, if a driver becomes a compulsive behavior, an individual could lose the ability to be flexible. These types of compulsive behaviors lead to stress.

MEDICATION

A local aeromedical authority, such as an aviation medical examiner (AME), should be consulted for the dosages and types of over-the-counter drugs that may be taken by flight-

crews. It should address the use of common items such as aspirin, antacids, mild laxatives and decongestants. Use of these types of medications may cause minor discomfort to a person on the ground. However, the same medication, taken in flight, could have a significant effect on a flightcrew member’s performance. Cabin crew members also should adhere to medical advice provided by an AME.

CREW ILLNESS

Company guidelines should prohibit flight departments from scheduling crew members when they are unfit or ill. Likewise, crew members should not accept flight assignments under those circumstances. An accepted preflight guide for personnel to follow when trying to determine whether or not they are fit to fly is the FAA acronym I’M SAFE, which stands for *illness, medication, stress, alcohol, fatigue, or emotion*. If any of these elements are present, they can affect a flight department member’s performance on the job.

ALCOHOL AND DRUG USE

The use of alcoholic beverages by crew members on duty or within the FAA-specified time limitations should be cause for disciplinary action. FAR Section 91.17 states that no pilot may act as a crewmember while under the influence of alcohol. The definition of “under the influence” includes hangovers.

The FAA specifies that at least 8 hours must have elapsed between the completion of alcohol consumption and the beginning of flight duty, and 8 to 12 hours is generally accepted by the business aviation community. FAR Part 91.17 also states that, except in an emergency, a crew member may not allow a person who is obviously under the influence of intoxicating liquors or drugs (except a medical patient under proper care) to be carried on the aircraft. It also specifies circumstances under which a crewmember should submit to a test that measures the level of blood alcohol. The regulations also specify that a crew member must submit to a drug or alcohol test when there is reasonable basis to believe the person was using any drug that affected the crew member’s faculties in a way contrary to safety.

FAR Parts 61.15 and 61.16 would require a pilot’s certificate to be suspended or revoked if the pilot is convicted of violating any Federal or state statute relating to an illegal drug, flying an aircraft while under the influence of alcohol or an illegal drug, flying an aircraft carrying an illegal drug, refusing to submit to an alcohol test or refusing to furnish alcohol test results to the administrator.

Operations that are certificated under Part 121 or Part 135 must have a drug testing program. These programs include pre-employment, random, periodic and forcause testing of five specific drugs. Such a program is not required by Part 91, but many companies include the crew under a company drug testing program. This program usually includes a requirement for a drug test as a condition of pre-employment

or in a for-cause situation. These tests often include alcohol and additional drugs not included in the program required by the FARs.

BLOOD DONATIONS

According to American Red Cross guidelines, a healthy person may donate blood once every eight weeks. After donating, a 72 hour waiting period prior to flight may be necessary. Caution should be exercised and a company physician may be required to approve crew blood donations.

2.4. Flight, Duty and Rest Time Considerations

Each aviation department manager should carefully consider flight and duty time limitations. For Part 91 operators, no crew duty limits are given in the FARs except for the eight-hour limitations for flight instructors. However, a company should establish and abide by limitations so that crewmember fatigue does not reduce the safety of any flight. This is true for both the single aircraft operations many NBAA Members currently use and the long-range aircraft options that are available. Planning ahead to minimize crew exposure to fatigue will keep safety paramount within business aviation operations. The Flight Safety Foundation has developed guidelines for establishing a reasonable company policy, which can be found on the web at www.flightsafety.org.

Limitations delineated in Part 135, Subpart F, *Crew Member Rest Requirements*, may be a useful guide to determine the maximum duty and minimum rest period for corporate flight operations. It is possible to tailor appropriate limitations with certain flexibility for the individual operation.

NBAA recommends that a crew swap consist of the entire crew. Qualified flight attendants are restricted to duty time limitations. It is recommended cabin servers maintain the same duty time limitations as the other crew members. In a situation where a flightcrew is augmented, the flight attendant or cabin server should be permitted to rest in an adequate sleep location for a period of time to prevent fatigue.

FATIGUE

Crew member fatigue, divided into transient fatigue (temporary) and cumulative fatigue (accumulating), will seriously reduce flightcrew reflexes and efficiency. Because fatigue can be the result of many factors and will vary with individuals, it is the duty of each flightcrew member to advise the manager or chief pilot when natural limitations are being reached. The aviation department manager needs to keep the lines of communication open on such conditions and realize that flightcrew members are not always aware of their level of fatigue. The credibility of an individual's self-evaluation decreases as the level of fatigue increases.

In the case of temporary fatigue, the flightcrew member is fully aware of the problem and the cure can be as simple as a good night's rest. The individual usually recognizes cumu-

lative fatigue and the cure involves a day or two away from work. The most serious part of the fatigue problem is the psychological component that causes the person to remain unaware of the problem or to deny its significance. Chronic fatigue requires a long period of time off and could require the assistance of a medical professional.

A flightcrew member will exhibit the same in-flight symptoms for all types of fatigue. As an individual's energy level is depleted, the subsequent degradation of skills becomes more pronounced. Perhaps the first recognizable sign is that the individual will accept lower standards of performance. Symptoms include decreased reaction time, reduced attention span, sloppy flying or roughness on the controls, and distorted judgment. Fatigue has eluded rigorous quantitative definition because each person is affected differently. Experienced flightcrew members should use every opportunity to combat fatigue. This includes altering diets when necessary, getting away from the airport for some exercise and utilizing day rooms for sleep whenever possible.

It is difficult to adjust to constantly fluctuating schedules due to the effect of circadian rhythms. Medical evidence confirms that a person cannot store sleep for an expected long duty day. The aviation department manager must constantly assess the company's travel requirements and adjust or design the flight and duty time to guarantee a consistently safe flight operation.

FLIGHT AND DUTY TIME GUIDELINES

Because business aviation is an on-demand operation, it is characterized by flexibility rather than rigid limitations; however, operations must be safe and highly efficient. Elements that affect crew fatigue include:

- Start and finish time of working day
- Length of the working day
- Time zone changes
- Dehydration
- Flight time
- Waiting time
- Duties other than those associated with the cockpit

These elements must be balanced and limited to prevent crew fatigue. NBAA advocates that written policies establish flightcrew duty time limitations. The flight operations manual should clearly state duty time limitations.

Any duty time limitations need to take into consideration the actual length of the duty day. The duty day begins when the crew enters company premises and ends when the crew leaves the premises. Duty time should include the overall time required to prepare, perform, and conclude a scheduled flight as well as the time needed for administrative functions, training, meetings and other duties not related to a flight. The effects of a company policy that requires

the crew to be available while on layovers for any schedule changes or emergencies also should be considered.

When making company policy about flight time, an aviation department should consider the effects of the flight environment. A crew that performs one crosscountry flight may not be as fatigued as a crew that performs a number of short flights into busy airports. The airspace environment also needs to be evaluated. A crew that only operates in busy areas such as the Northeast, Southern California or the Great Lakes region of the United States is apt to become fatigued faster than a crew that primarily operates in less busy airspace.

The maximum duty and flight times for most operations could range from 12 to 16 hours of duty time with 8 to 12 hours of flight time. A lower number could be assigned for operations in busy airspace and a higher number could be assigned for less strenuous or longrange flights. Some companies also have maximum duty and flight times over a five-day time period. An example could be a maximum of 50 hours of duty and 34 hours of flight time.

It is recommended that cabin crew members be included during a swap. The entire crew should be swapped out of the trip based on the duty day time.

REST TIME GUIDELINES

Adequate rest time is an important element of flight and duty time considerations. Again, the type of flight operations needs to be taken into account. A minimum period of eight hours should be considered as a baseline. However, in most instances, the crew member needs at least 10 hours of rest within a 24-hour period. This would ensure that the crew members have time for an adequate rest and a balanced meal.

Crews need time to adjust to a different time zone. The human body's circadian rhythms will adjust themselves at a rate of approximately one day per time zone. Each week should contain a scheduled period of extended relief from duty consisting of one or more consecutive days. Additional monthly and annual minimum schedule periods of extended relief also need to be established. These policies must be followed.

Transportation to or from a trip should be included in the scheduling. Commuting is not considered rest time.

2.5. Transient Facilities and Services

Information on airports and facilities used by a company's aircraft can be obtained from a variety of sources. NBAA advises that operators retain more than one information source because no one single publication includes all the information aviation departments would need. The FBO could be a contact to arrange services. If the FBO is used infrequently, it is recommended that a telephone call be made to confirm the latest information.

Publications that could be used are:

- The *Airport/Facility Directory* is published by the National Ocean Service every 56 days
- Aviation USA is published annually by the Aircraft Owners and Pilots Association (AOPA)
- The Corporate Pilots Airport/FBO Directory is published on an annual basis by AC-U-KWIK; copies can be obtained at FBOs
- The Jeppesen Airport and Information Directory (J-AID) is updated every 56 days by Jeppesen Sanderson
- *Professional Pilot* magazine publishes an annual FBO Directory

Many of these publications are also available online via web sites, mobile apps and/or tablet apps.

The Standard Service Form (see **Figure 2.1**) was designed for the travel coordinator to use as a learning tool. It helps the first-time scheduler/dispatcher to cross reference necessary and vital trip information. It also is used as a communication tool between the travel coordinator and the FBO. The form's purpose is to help eliminate errors and oversights in trip scheduling.

AIRPORT ACCESS AFTER FBO HOURS

Many airports have constructed airport perimeter fencing to control wildlife populations and human access within the airport boundaries. Addressing these issues, airports have elected to fence off the operations area and to lock gates after hours. After hours access to the ramp or airplane may be difficult.

Be proactive; call to verify the hours of attendance and accessibility. Verify phone numbers to receive after-hours service. An FBO may remain open if you are willing to pay an after-hours surcharge. You may be required to use a different airport that has an open FBO, or modify your time schedule.

Should you find yourself locked out (or in) at an airport, the following steps may help:

- Look for a telephone number posted by the FBO to call for after-hours service. There may be a sign visible from the ramp, in a window of the FBO, in an after-hours pilot lounge or in the terminal building itself, or on the FBO's web site, if you have Internet access. Start by contacting the FBO at this number.
- Try contacting the airport manager or airport authority if such a number isn't available. This information is part of the airport's 5010 data and contact information, available through flight planning web sites. Check www.ftplan.com, www.airnav.com or the U.S. & Territories Airport Lookup page via the FAA site at <https://airports-gis.faa.gov/airportsgis/airportLookup/>.

Figure 2.1: NBAA Standard Service Form

STANDARD SERVICE FORM (CONFIDENTIAL)				
New / Revised	Date/Time:	Flight Number:		
Company:	A/C Tail:	A/C Type:		
Point of Contact:	Phone:	Fax:	Captain:	
ARRIVAL: S M T W T F S	Date:	ETA:	(L)/:	(Z) POD:
	<input type="checkbox"/> Quick Turn	<input type="checkbox"/> RON	Hangar: <input type="checkbox"/> Yes <input type="checkbox"/> No	
DEPART: S M T W T F S	Date:	ETD:	(L)/:	(Z) POA:
AIRPORT AND FBO INFORMATION				
City:	Airport:	FBO:	ARINC/UNICOM:	
FBO Phone:	FBO Fax:	CSR:		
Airport Restrictions/Requirements:				
Special Requests:			Posted Fuel Price:	
Fuel Cards Accepted: AVCard BP Exxon MC/Visa MultiServ Phillips Texaco Other: _____				
TRANSPORTATION				
PAX <input type="checkbox"/> Has been arranged <input type="checkbox"/> Please arrange		CREW <input type="checkbox"/> Has been arranged <input type="checkbox"/> Please arrange		
RENTAL CAR: Avis Budget Hertz Other: _____		RENTAL CAR: Avis Budget Hertz Other: _____		
Compact Mid Full Luxury Van		Compact Mid Full Luxury Van		
Confirmation #: _____		Confirmation #: _____		
PRIVATE: Name: _____ Phone: _____		OTHER: Hotel Pick-up Crew Car Taxi		
OTHER: Taxi Van Sedan Limo # of Pax: _____		Name: _____		
Confirmation #: _____		Address: _____		
Company/Contact: _____		DL#: _____ Exp.: _____		
Phone: _____ p.u.: Ret.: _____		State: DOB: _____ CC Type: _____		
Destination: _____		CC#: _____ Exp.: _____		
LEAD PAX: _____		SPECIAL INSTRUCTIONS (i.e., Rental Card #, etc.)		
Address: _____		_____		
DL#: _____ Exp.: _____		_____		
State: DOB: _____ CC Type: _____		_____		
CC#: _____ Exp.: _____		Contact Person: _____		
CATERING				
Delivery Date:	Time:	Catering Company:	Phone:	
Price Range:	Date/Time Ordered:	Contact:		
Box Lunch: Qty:	Type Sand:	Bread Type: White Whole Wheat Rye Roll/Bun		
Sand. Tray: Qty:	Type Sand:	Bread Type: White Whole Wheat Rye Roll/Bun		
Fruit Tray: Qty:	# of Pax:	Vegetable Tray: Qty:	# of Pax:	Dessert Tray: Qty: # of Pax:
Danish Tray: Qty:	Type:	Muffins: Qty:	Type:	Bagels: Qty: Type:
Continental Breakfast: Qty: # of Pax:		_____		
Special Catering Requests _____				

Company _____ Tail Number: _____ A/C Type: _____ Date/Time: _____

HOTEL ACCOMMODATIONS

PAX Has been arranged Please arrange
 Hotel Preference 1: _____
 Hotel Preference 2: _____
 Price Range: _____ XL Policy: _____
 Check-in Date: _____ Check-out Date: _____
 Lead Pax: _____
 CC & #: _____ Exp.: _____
 Rm Req: S D Q K Suite/Smoking Non-Smoking
 Add. Pax: _____
 CC & #: _____ Exp.: _____
 Rm Req: S D Q K Suite/Smoking Non-Smoking
Hotel Booked:
 Point of Contact: _____
 Phone: _____ Fax: _____
 Rate: _____ XL Policy: _____
 Name/Conf. #: _____
 Name/Conf. #: _____
 Name/Conf. #: _____
 Cancellation #: _____

CREW Has been arranged Please arrange
 Hotel Preference 1: _____
 Hotel Preference 2: _____
 Price Range: _____ XL Policy: _____
 Check-in Date: _____ Check-out Date: _____
 PIC: _____
 CC & #: _____ Exp.: _____
 Rm Req: S D Q K Suite/Smoking Non-Smoking
 SIC: _____
 CC & #: _____ Exp.: _____
 Rm Req: S D Q K Suite/Smoking Non-Smoking
 Hotel Booked: _____
 Point of Contact: _____
 Phone: _____ Fax: _____
 Rate: _____ XL Policy: _____
 Name/Conf. #: _____
 Name/Conf. #: _____
 Name/Conf. #: _____
 Cancellation #: _____

INTERNATIONAL ASSISTANCE

Crew: _____ Citizenship: _____ # Pax: _____ Citizenship: _____

Please send the FBO the following information for each crew and pax: Name, Nationality, DOB, Passport # and Exp. Date.

Passport Required: Yes No Visa Required: Yes No Type of Visa: _____

Business Single Entry Business Multiple Entry Tourist Single Entry Tourist Multiple Entry

Services required upon arrival: Customs Immigration Agriculture Int'l Burn*

*Will Int'l Burn take current catering? Yes No

SPECIAL PERMITS/REQUIREMENTS: _____

Animals on Board: Yes No Type of Animal: _____ Vaccination Records Req: Yes No

Special Requirements: _____

MISCELLANEOUS

INFORMATION IS CONFIDENTIAL – DO NOT DUPLICATE

- The county sheriff's office or local police station could be contacted if all else fails.

The TSA might have a representative if the airport is served by an airline. However, the agency might not be in a position to grant you access to the ramp, nor is it likely to have an interest in how access is granted or conveyed to non-airline aircraft.

NBAA strongly recommends that operators *do not* climb over a fence to access their aircraft or to exit the aircraft operations area (AOA).

2.6. Crew and Passenger Relations

Although the responsibility for the safety and comfort of passengers in business aircraft rests with the pilot in command, the entire crew is involved. Most passengers, even the most experienced, are sometimes apprehensive about flying. The crew should exert an accommodating and reassuring influence on the passengers and make every trip as comfortable and pleasant as possible.

Passengers always should be:

- Escorted to and from the aircraft by a flight department employee at home base or by a crew member while on the road
- Assisted with their luggage prior to and after flights
- Let to a cabin seat and made to feel as comfortable as possible
- Treated with respect and deference

PASSENGER BRIEFINGS

Passengers need to be briefed on emergency exits and procedures. FAR Part 91 requires the pilot in command or flight attendant to ensure that passengers have been notified to fasten their seat belt and shoulder harness, if installed. A company-trained flight attendant designated to perform safety functions is eligible to perform this duty, but a cabin aide or cabin attendant is not.

Part 91 also requires the pilot in command or flight attendant to provide a briefing to those unfamiliar with the aircraft, but this briefing need not be given when the pilot in command determines that the passengers are familiar with its contents.

The briefing, supplemented by printed cards for the use of each passenger, should contain the following information:

- When, where and under what conditions is smoking prohibited
- Use of seat belts
- The placement of seats, tray tables, equipment and stores before takeoff and landing
- Prohibition on the use of cellular telephones and certain

other portable electronic equipment while in flight

- Location and means for opening the passenger entry door and emergency exits
- Location of survival equipment
- Ditching and the use of required flotation equipment, if the flight involves extended overwater operations
- The normal and emergency use of oxygen, if the flight involves operations above 12,000 feet MSL
- Location and use of fire extinguishers
- Location of passenger safety briefing cards

Aboard business aircraft, passengers also should be advised of convenience equipment, such as desks, radios, lavatories and food and beverage service, if available. Before each leg of a flight, a crew member should give the passengers information on the next stop, estimated time of arrival, cruising altitude, weather expected enroute, weather at the destination and alternate plans, if marginal weather is probable. If light turbulence is encountered, passenger apprehension usually can be dispelled with a casual explanation and reassurance from a crewmember.

A crew member should ensure that the passengers are kept informed of the flight's progress. Such information could include present position, route, air speed or ground speed, altitude and estimated time of arrival. When time permits, crew members should call attention to sights that might interest passengers. However, some passengers would rather not be interrupted by a routine (not safety related) announcement; this may be determined by asking the principal passenger if he/she wants flight progress announcements.

Careful explanations and advance notice of unusual operations may ease the passengers' comfort. When there is a delay because of weather or other reasons, the passengers should be notified and given an estimate of expected departure or arrival times. Passengers should be advised of such delays as soon as they become evident. In addition, contacting waiting parties on the ground also will help reduce tension caused by delays. If the successful arrival at the planned destination becomes doubtful or impossible, the principal passenger should be consulted in private to discuss alternative courses of action.

PASSENGERS REQUIRING SPECIAL ATTENTION

Some passengers who fly frequently on the company aircraft may have physical ailments that do not prevent them from working. However, they may require special diets and/or medication, and the crew should be aware that a problem may develop during flight. These matters should be discussed in a confidential conversation with the individual, the individual's physician and the aviation department

manager so a plan can be developed that will enable the crew to respond to any potential problems.

Other employees or guests may require special attention and assistance. Incapacitated or handicapped passengers may be taken aboard company aircraft if those persons are capable of personal care without unreasonable attention and assistance from the crew. If additional attention is needed, the passenger should be accompanied by an attendant who would be responsible for providing the proper care. The aviation department manager should be informed of the circumstances and the name of the passenger's physician in advance of the flight to determine whether special facilities are needed. If a company physician is employed, it would be prudent for the aviation department manager to seek the physician's advice and counsel regarding special arrangements or potential risks. If the prospective passenger has no physician and no company physician is employed, NBAA advises that a physician with a background in aviation medicine be consulted. The corporate legal counsel also should be consulted to determine whether a hold harmless agreement (i.e., special written permission given before a flight allowing the aircraft to land on some airfields for technical stops) should be executed for a given flight.

Children under 12 years of age should be accompanied by a responsible adult. Women who have passed the eighth month of pregnancy should be asked to furnish a physician's statement that the given flight will not be detrimental to the passenger's health and well being.

Another passenger requiring special attention is the problem passenger. Some passengers may be intoxicated. Others could be under severe stress or have a fear of flying. Those complacent about flying also can be problem passengers; they are the ones who will not put on a seat belt, request the briefing be skipped, or insist on departing from or landing at an airport where there is inclement weather.

While unruly or uncooperative passengers are rare, the pilot in command must be assertive to secure the safety of the flight. Reminding passengers with unreasonable demands of the primacy of the pilot in command should solve many of the problems. It is the prerogative of the pilot in command to terminate the flight in extreme circumstances, however.

2.7. Pilot-in-Command Authority

FAR Part 91.3 states that the pilot in command of an aircraft is directly responsible for, and is the final authority on, the operation of the aircraft. The pilot in command is vested with the final decision on whether or not to proceed with the flight. Company policy must stress that the pilot in command cannot be pressured by executives or management into making that decision.

Company policy also should stress that the person designated as pilot in command is the final authority on whether

that pilot is performing flying or non-flying duties. Pilot in command responsibilities include:

- Ensuring compliance with FARs
- Ensuring compliance with company policy
- Reviewing the correctness of all aspects of flight planning
- Monitoring the performance of subordinate crew members and providing training as appropriate
- Exercising command authority in routine and emergency situations

Only one pilot can act as the pilot in command for each flight. This person must be designated in writing and listed on the flight schedule as the pilot in command.

2.8. Standard Operating Procedures

Aviation department managers are responsible for efficient and safe cockpit management and should set standard operating procedures (SOPs) for all phases of flight. Flightcrews should understand that SOPs are the foundation of crew coordination. Training in cockpit resource management will enforce the SOPs and add an important safety factor.

Airframe manufacturers' pilot operating handbooks contain procedural checklists and may include SOPs. FAR Section 91.503(b) includes cockpit checklist items for large and turbine-powered multi-engine airplanes. Aviation department managers may desire to add items based on practical aviation knowledge, experience and aircraft accident reports that reveal poor cockpit management. Flightcrews should be encouraged to evaluate procedures continuously for efficiency and effectiveness and recommend appropriate changes. A company can provide their SOPs to the pilot school that trains its pilots so the SOPs can be included in initial training and recurrent training.

Most flightcrews favor the challenge-and-response method of communication as the means to ensure that monitoring is being accomplished and that any deviation from acceptable operating limits is recognized and corrected. An electronic checklist, displayed via a radar screen or the Electronic Flight Information System (EFIS), offers a flightcrew the opportunity to utilize a quiet checklist. Because both pilots can see the condition of a checklist item, the non-flying pilot may complete many non-essential checklist items without calling for a response. However, items that are essential to the aircraft's configuration (e.g., landing gear, flaps) should be subject to the challenge-and-response method and should be included in a company's SOPs. The following items should be considered in the SOPs in addition to FAR 91.503B.

PRE-TAXI/DEPARTURE BRIEFING

Flightcrew could brief the taxi and departure, discussing any risk mitigation for the taxi, runway incursion "hot spots,"

and departure. This briefing may be conducted before passengers are on board the aircraft.

ENGINE START UP

Aircraft require a checklist for normal and emergency procedures. Crew coordination on the setting of instruments, radios, navigation equipment and flight management equipment is recommended. Refer to the aircraft flight manual for details.

VFR TAKEOFF, ABORTED TAKEOFF, CLIMB AND CRUISE

The takeoff briefing and crew coordination procedures could include standardization of flightcrew interaction for mechanical procedures, (i.e., when to call for gear up, flap retraction). Items could include specified limitations and procedures for crosswind and downwind operations and adjusted V speeds for usual runway conditions. After takeoff, the crew should be advised to complete the checklist and continue visual scanning.

IFR TAKEOFF, ABORTED TAKEOFF, CLIMB AND CRUISE

The takeoff briefing and crew coordination could include specific procedures for alternate airports, use of radar (if equipped), operation in icing conditions and the Standard Instrument Departure (SID). After takeoff, the crew should be advised to complete the checklist and continue visual scanning.

INSTRUMENT APPROACHES

A high degree of crew coordination is essential for both precision and non-precision approaches. It is recommended that preparation begin prior to initial descent (about 20 minutes before anticipated landing) or after the Automatic Terminal Information Service (ATIS) information has been received. The pilot in command should review the following items with the second-in-command:

- Standard terminal arrival (STAR)
- Any abnormal aircraft conditions
- Type of approach to be made
- Altitude to be used on the initial approach
- Altitude at which the final approach fix will be crossed
- Minimums involved
- Decision height (DH) or minimum descent altitude (MDA)
- Missed approach procedures
- Risk mitigation(s) for the specific approach and landing expected
- Risk mitigation(s) for the taxi to the ramp, including review of runway incursion “hot spots”

Procedures should require the flightcrew to use all available approach and landing aids, monitor autopilot operation closely when in use, monitor all data indications on vertical and lateral guidance and continually cross-check instruments that provide redundant information.

Specific challenge-and-responses, or callouts, should be standard on all descents, approaches and landings. The following callouts are suggested. These will differ with non-precision approaches.

- 18,000 feet MSL altitude
- 10,000 feet MSL (250 knots indicated airspeed)
- Glide slope interception
- Crossing final approach fix
- 1,000 feet above DH/MDA 500 feet above DH/MDA
- Complete checklist
- 100 feet above DH/MDA
- DH/MDA
- Airspeed (Any time it varies below or above reference by 10 knots and any time the rate of descent goes below or above the established parameters.)

On missed approaches, heading, altitude and the location of the highest obstacle in the area are the major considerations.

Two common methods for performing an instrument approach should be considered. In the first method, the pilot in command flies the aircraft and the second-in-command monitors the flight path and instruments. In the second method, the second-in-command flies the aircraft and the pilot in command monitors the flight path and instruments.

Under the first method, the pilot in command would make the landing or initiate the missed approach on the advice of the second-in-command depending on whether the runway is in sight at DH. If the runway is not in sight, the decision for a missed approach is automatic.

The second method dictates that, at not less than 100 feet above DH, the pilot in command’s primary attention must be directed outside the aircraft to seek visual references. As visual contact materializes and the pilot in command determines that the approach can be completed to landing, the pilot in command pushes the second-in-command’s hand from the throttles and calls out “I’ve got it.” This indicates that the pilot in command will land the aircraft. If the pilot in command loses visual contact, or a go-around is needed for another reason, a missed approach is executed. If the pilot in command does not assume control of the aircraft by the time the aircraft reaches DH, the second-in-command is to execute a missed approach. This is to be automatic. Verbal commands are not involved that would confuse or delay the action.

VISUAL METEOROLOGICAL CONDITIONS APPROACH AND LANDING

Large or turbine-powered aircraft are required to remain on or above the glide path per FAR 91.129(e)(2). Standardization should include procedures to tune the electronic glide path in the navigation radios for an approach, even in visual meteorological conditions if the runway is served by an ILS or WAAS LPV approach. The use of pilot-controlled airport lighting may be necessary even during daylight operations. The VASI at some airports is controlled through the PCL (pilot-controlled lighting). Risk mitigation(s) for the visual approach and landing as well as taxi to the ramp and review of runway incursion "hot spots" should be briefed prior to initial descent or after the Automated Terminal Information Service (ATIS) information has been received.

OPERATIONS AT NIGHT

Night operations bring special hazards and challenges. Some recommendations for enhancing safety at night include:

- Require operational runway and airport lights for nighttime operation. Activate pilot-controlled lighting at uncontrolled airports for taxi, takeoff and landing.
- Do not operate to a runway that is not served by either electronic or visual vertical guidance.
- Fly an instrument approach procedure (IAP) until in position for landing.
- On departure, utilize an obstacle departure procedure (ODP) if one is published for the airport, even if the weather is VMC.
- Plan straight-in landings whenever possible. If not possible, only circle if it can be done visually in a visual flight rules (VFR) pattern.
- Remain on the electronic glide path or VASI to the threshold and aim to touch down at the 1,000 ft. mark. Do not "duck under" the electronic glide path or VASI.
- Be on the alert for animal activity.

STERILE COCKPIT

According to FAR Parts 121.542 and 135.100, an air carrier crew is not permitted to engage in other than required duties (e.g., non-essential conversations, reading, paperwork) during ground operations involving taxi, takeoff and landing, or other flight operations conducted below 10,000 feet MSL, except when an aircraft is in cruise flight. NBAA recommends that this valuable safety concept be included in a company's SOPs.

AIRCRAFT MALFUNCTION PROCEDURES

The pilot's operating handbook or aircraft flight manual outlines these procedures. Many well-trained pilots have

committed emergency procedures to memory and respond instinctively to messages delivered by the aircraft instruments.

Although instinctive and conditioned responses occur, total crew involvement must be initiated as soon as possible, especially if the aircraft is in a critical phase of flight.

Control of the aircraft is a primary consideration. Once this has been accomplished, the crew can coordinate and accomplish the various steps involved in the specified emergency procedures. The pilot in command needs to manage the flightcrew to ensure the safe operation of the aircraft. This consists of leadership, delegation of tasks and responsibilities, setting priorities, monitoring the situation and communicating intent and plans. The pilot in command cannot permit an emergency situation to override the safe operation of the aircraft.

If the malfunction involves any of the following, the aircraft operator immediately must notify the nearest NTSB field office under Part 830 of the NTSB regulation:

- A flight control system
- Failure of a turbine engine's internal components that results in the escape of debris other than out the exhaust path
- An in-flight fire
- Release of all or a portion of a propeller blade from an aircraft (except when caused solely by ground contact)
- A complete loss of information from more than half of an aircraft's electronic displays (excluding flickering)
- Damage to helicopter tail or main rotor blades that requires major repair or replacement of the blades.

NBAA suggests that the following information be given to the appropriate air traffic control facility to assist in an emergency landing:

- Description of the mechanical problem
- Aircraft type
- Type of landing expected (long, short, or normal)
- Standby emergency equipment
- Number of passengers
- Special or handicapped passengers and seat locations
- Cargo type
- Hazardous materials
- Fuel amount, in quantity and time
- Estimated time of arrival

EVENTS REQUIRING NOTIFICATION TO THE NTSB

In addition to the system malfunctions listed earlier in this section that require notification to the nearest NTSB field office under Part 830 of the NTSB regulations, there are additional situations that must be reported to the NTSB. They include:

- When Airborne Collision and Avoidance System (ACAS) or Traffic Collision Avoidance System (TCAS) resolution advisories are issued to aircraft operating on an IFR flight plan and compliance with the advisory is necessary to avert a substantial risk of collision between aircraft, or when an advisory is issued to an aircraft operating in class A airspace.
- When an airplane operated by an air carrier at a public-use airport lands or departs on a taxiway, incorrect runway or other area not designated as a runway.
- When an airplane operated by an air carrier at a public-use airport experiences a runway incursion that requires the operator or the crew of another aircraft or vehicle to take immediate corrective action to avoid a collision.

For a complete list of malfunctions and situations that require immediate notification to the nearest NTSB field office, see NTSB Regulation 830.5.

2.9. Minimum Approach Standards for New Pilots

Higher minimum approach standards may be established for a person who is acting as pilot in command and has logged 100 hours or less in the particular type of aircraft. FAR Section 135.225(d) provides guidance that may be used by business aircraft operators. The regulation stipulates that the DH or MDA and visibility landing minimums be increased by 100 feet and a half mile, respectively. Other considerations are crosswind and tailwind components as well as runway lengths and widths.

2.10. Takeoff Weather Minimums

Part 91 imposes no weather minimum restrictions on takeoffs even though the airport may have zero visibility conditions. Business aircraft operators will generally delay a flight if weather conditions would preclude a safe return in the event of an emergency shortly after takeoff. A company may desire to impose absolute takeoff minimums.

Additional standards can be adopted from Parts 135 and 121. For example, FAR Section 135.217 specifies that an aircraft cannot depart if the weather conditions at the airport of takeoff are at or above takeoff minimums, but below authorized IFR landing minimums, unless an alternate airport is within one hour of flying time at normal cruising speed in still air of the departure airport.

FAR Section 121.617 has a similar requirement except that for two-engine aircraft the alternate airport must be no more than one hour from the departure airport at normal cruising speed in still air with one engine inoperative. For aircraft with three or more engines, the alternate airport must be no more than two hours from the departure airport at normal cruising speed in still air with one engine inoperative.

Business aircraft operators that desire to meet air carrier standards also could follow the requirements found in Part 135, Subpart D – *VFR/IFR Operating Limitations and Weather Requirements*. Section 135.225(f) requires that the weather at the departure airport be above the takeoff weather minimums prior to takeoff. FAR Section 135.219 requires that the destination airport be forecast to be above authorized weather minimums at the estimated time of arrival. FAR Section 134.221 has similar requirements for the alternate airport.

2.11. Landing Minimums

Regarding landing area conditions, the operator should establish minimum requirements on the basis of the manufacturers' operating handbooks. FAR Section 91.175 states in part that no pilot may land an aircraft when the flight visibility is less than the visibility prescribed in the standard instrument approach procedure being used.

Although business aircraft operators governed by Part 91 are not constrained from initiating instrument approaches on the basis of reported weather, commercial aircraft under Part 121 or Part 135 may not execute an instrument approach when the visibility is reported to be less than the prescribed landing minimum for the airport. Under the Part 91 rules, a business aircraft operator may initiate an instrument approach with weather reported below minimums. FAR Section 91.175 requires that at DH, a go-around or missed approach procedure must be initiated if the runway environment is not in sight. Controversy may arise, however, when the aircraft lands with the weather still reported below minimums although in the pilot in command's judgment, there was sufficient ceiling and visibility.

NBAA suggests that the company aviation department manager establish a clearly defined policy on weather minimums for initiating instrument approaches. NBAA advises that the following options be considered:

- Initiate an instrument approach when the ceiling and visibility are reported to be below minimums prescribed for the approach specified. In this case, the pilot in command automatically will divert the flight to the alternate airport.
- Initiate an instrument approach when the ceiling and visibility are reported to be below minimums prescribed for the approach specified. However, ensure that crewmembers adhere to FAR 91.175 for missed approach procedures. In addition, the missed approach procedures for the specified approach should be reviewed thoroughly

prior to beginning the approach to ensure proper cockpit coordination.

The company may wish to specify higher minimums based on precipitous terrain, type of flight operation and the flight-crew experience. FAR Section 135.225 specifies that weather minimums must be at or above the IFR landing weather minimums in order to commence the final approach segment of an instrument approach. Provisions are also made for the completion of an instrument approach if the pilot has begun the final approach and later weather reports state that the destination airport is below weather minimums.

2.12. Postflight Procedures

The flightcrew should follow the procedures outlined in the aircraft's manufacturers operations handbook for shutting down and securing the aircraft. Additional procedures could include:

- Noting all discrepancies in the discrepancy log, or squawk sheet
- Performing a crew debrief
- Closing and locking all doors and hatches
- Ensuring that the aircraft is parked in a well-lit area
- Activating security systems (if installed)

2.13. NBAA Noise Abatement Program

NBAA's Noise Abatement Program has been in existence since 1967 and was last revised June 1, 1996.

The NBAA objectives and operating procedures have withstood the test of time and have been effective in reducing noise exposure for citizens on the ground. The NBAA noise procedures are recommended as a standard for all operations where aircraft manufacturers have not recommended specific procedures. The NBAA procedures are to supplement and be complementary to established noise abatement programs containing procedures and techniques for specific aircraft manufacturers and local airport authorities.

Although the aircraft manufacturers, as a group, have not established specific noise abatement procedures for every aircraft, some individual manufacturers have taken steps in this direction and are to be commended for their initiatives in this area. Business aircraft operators should request noise abatement procedures from the aircraft manufacturers or work with them in developing noise abatement procedures for inclusion in the aircraft manuals. When professional opinion indicates that the procedures and techniques recommended for specific aircraft and local airports are less effective than the NBAA procedures, pilots should contact the manufacturers and airport authorities with specific recommendations for change.

NOISE ABATEMENT PROGRAM OBJECTIVES

The following objectives are established for all noise abatement procedures of the NBAA Noise Abatement Program for jet aircraft.

- **Safe** – Procedures not only must meet the requirements for known parameters of aircraft performance but also must provide adequate safety margins so that a prudent, competent pilot will be willing to use them on a repetitive and routine basis under varying conditions.
- **Standardized** – The same procedures should be applicable to all runways and all airports. For example, the entry point of the second reduced power segment of the NBAA Close-in Departure Procedure is expressed as an altitude and not as a geographic fix. Similarly, the terminal point of this procedure is based on an altitude at which return to climb thrust will not create excessive noise. It should not be based purely on local factors such as geographical fixes. Some NBAA procedures impose an operational penalty that cannot be justified solely by the noise level reduction achieved by each aircraft type. Therefore, it is necessary to make such compromises to achieve standardized procedures that could be used regardless of type and class of aircraft.
- **Uncomplicated** – Complexity can create misunderstandings, resistance to use and loss of effectiveness. Therefore, the NBAA Noise Abatement Procedures are designed to be easily understood, easy to accept and are applicable to all types and classes of aircraft at all airports.

The NBAA recommended program for reducing the noise impact of turbojet business aircraft has broad implications for all the various communities affected by aircraft/airport operations.

TURBOJET BUSINESS AIRCRAFT OPERATIONS

Business aircraft operators must accept responsibility for operating their aircraft in such a manner as to reduce the noise impact to the lowest practicable level. Noise abatement procedures should be made part of the routine in operating aircraft in and out of all airports.

Aircraft operators must also take the initiative and responsibility to obtain all pertinent information on the local noise abatement policies followed at any airport they currently use, or expect to use in the future.

Operators should be aware that unnecessary use of reverse thrust when landing can be a source of excessive noise. Therefore, except for eliminating residual thrust, the use of minimum reverse thrust necessary for safety is recommended, consistent with runway conditions and available length.

LOCAL COMMUNITIES AND AIRPORTS

The noise abatement procedures recommended by NBAA are suggested as a national standard for business jet aircraft. They may be applied to any noise sensitive airport. Procedures adopted by any locality should, whenever fea-

sible or beneficial, conform to such a national standard to ensure pilot understanding, acceptance and use.

NBAA Member Companies should participate in local airport affairs, particularly those concerning noise abatement procedures. Where necessary, technical assistance can be provided to assist airport management in adopting procedures that meet the objectives of the NBAA Noise Abatement Program as they relate to operational safety. Every effort should be made to tailor procedures to the specifics of each airport in order to provide the maximum noise reduction consistent with safe operational practices and without unduly restricting the flow of air traffic.

Communities must be given factual data to demonstrate that airport noise level reductions below those achievable through the procedures described cannot be realistically anticipated with current aircraft and engines.

Approach aids of various types can aid noise abatement procedures at an airport. Improvements in approach aids and runway facilities increase the possibilities for aircraft to use specific runways and approach patterns over the least noise-sensitive areas. Optimal employment of visual and electronic approach aids should be investigated by the airport management.

Airport approach and takeoff paths should be designated on all official zoning maps. This should be done for all airports existing or proposed, in order that real estate activity is conducted with full awareness of the confines of such areas. Similarly, the land use permitted in these areas should be specified in zoning regulations and building codes in order to protect inhabitants.

Jet aircraft runup areas should be developed but usage limited to normal daylight work hours (Monday to Friday), for least noise disturbances to airport tenants and local communities. Blast fences, hush houses, etc. should be provided and used where necessary.

Airport management should take a close look at the airport's natural terrain and consider ways in which improvements to landscaping might improve noise conditions around the airport.

Airport management should post signs in pilot information centers, as well as at conspicuous places along the taxiways or runway areas, giving the pilots a last reminder that they are in a noise-sensitive area calling for use of noise abatement procedures.

A mixing of high and low performance general aviation aircraft on the same runway is often the cause for noticeable additional noise. Some problems that can arise from this type of intermixing are:

- Excessive go-arounds
- Extended flight over noise-sensitive areas by aircraft in the high-drag high-power-setting configuration (flaps and landing gear extended)

- Derogation of the pilot's ability to follow noise abatement procedures to the fullest
- Excessive holding before takeoff

The airport management has the responsibility to look at all possible alternatives to control these types of situations. For example, building a short runway of 2,500 to 3,500 feet for the use of low performance aircraft not only would help solve many of the problems listed above, but also would allow the airport management to set up more effective noise abatement procedures.

The airport and ATC management should conduct a procedures review to recommend and implement new airport noise awareness programs. Adding a phrase such as use noise abatement procedures to all tower takeoff clearances also should be included in the recommendations.

AIRFRAME AND ENGINE MANUFACTURING

The lowest engine noise levels that can be achieved by engine and airframe manufacturers, without imposing excessive operational penalties, should be determined. New aircraft should be designed to remain within the lowest noise limitations. Regulatory noise limitation on manufacturers should be confined to that which can be achieved within the existing state of the art. Any regulatory action should have sufficient flexibility to permit further noise level reductions as they are developed.

Power settings that will achieve a specific flight profile for noise abatement purposes should be developed and published in the manufacturer's flight manuals. Maximum gross weights should be used because business jet aircraft generally have limited gross weight flexibility without incurring an unrealistic operational penalty. Weight reduction as a means of achieving noise reduction is not practical for business jet aircraft. A power setting recommended by manufacturers should meet the following minimum safety criteria:

- Approach and Landing –
 - Sufficient engine RPM to permit rapid acceleration of the operative engine(s) in the event of engine failure
 - Sufficient engine RPM to permit rapid acceleration of the engine(s) in the event it becomes necessary to abort the approach or landing
 - Sufficient engine RPM to operate anti-icing equipment
 - Sufficient engine RPM to operate component equipment
- Takeoff – Sufficient engine thrust to provide a sustained rate of climb of 1,000 FPM

FLIGHT INFORMATION AND TRAINING

Pilot training for turbojet business aircraft should include basic noise abatement procedures in all types of ratings and ATR flight checks.

It is important that airport management realize that successful application of each airport's noise abatement procedure depends on the effort that is put into educating the pilots and the controllers. Airport management should consider an education program to inform pilots and controllers as to the need for and procedures associated with noise abatement and good community relations. A more thorough understanding by the pilots and the controllers as to what the procedures are, as well as the reasons behind them, is the key to success.

Specific information should be developed by airport management and made available to pilots and controllers through publication of easily attainable flight manuals, NOTAMs, AIMS, letters to airmen, charts and explanatory pamphlets. This information should include:

- Approach and departure paths over least noise-sensitive areas
- Preferential runway usages
- Emphasis on use of NBAA's noise abatement procedure
- General map showing surrounding areas and marking places of specific sensitivity, such as schools and hospitals

NBAA STANDARD DEPARTURE PROCEDURE

Climb at maximum practical rate at V_2+20 Knots indicated airspeed (KIAS) to 1,000 feet above field level (AFL) with takeoff flap setting.

At 1,000 feet AFL, accelerate to final segment speed (V_f s) and retract flaps. Reduce to a quiet climb power setting while maintaining 1,000 FPM maximum climb rate and airspeed not to exceed 190 KIAS until reaching 3,000 feet AFL. If ATC requires level off prior to reaching 3,000 feet AFL, power must be reduced so as not to exceed 190 KIAS until at or above 3,000 feet AFL. Note: It is recognized that aircraft performance will differ with aircraft type and takeoff conditions; therefore, the business aircraft operator must have the latitude to determine whether takeoff thrust should be reduced prior to, during, or after flap retraction.

At 3,000 feet AFL and above, resume normal climb schedule with gradual application of climb power. Observe all airspeed limitations and ATC instructions.

NBAA CLOSE-IN DEPARTURE PROCEDURE

Climb at maximum practical rate at V_2+20 KIAS to 500 feet AFL with takeoff flap setting.

At 500 feet AFL, reduce to a quiet climb power setting while maintaining 1,000 FPM maximum climb rate and V_2+20 KIAS until reaching 1,000 feet AFL. At 1,000 feet AFL, accelerate to final segment speed (V_f s) and retract flaps. Maintain quiet climb power, 1,000 FPM climb rate and airspeed not to exceed 190 KIAS until reaching 3,000 feet AFL. If ATC requires level off prior to reaching 3,000 feet AFL, power must be reduced so as not to exceed 190 KIAS. Note: It is recognized that aircraft performance will

differ with aircraft type and takeoff conditions; therefore, the business aircraft operator must have the latitude to determine whether takeoff thrust should be reduced prior to, during, or after flap retraction. Also, aircraft in excess of 75,000 lbs. GTOW operating under FARs Part 121, Part 125, or Part 135 may not be permitted to comply with this procedure.

At 3,000 feet AFL and above, resume normal climb schedule with gradual application of climb power. Observe all airspeed limitations and ATC instructions.

NBAA APPROACH AND LANDING PROCEDURE VFR & IFR

Inbound flight path should not require more than a 20 degree bank angle to follow noise abatement track. Observe all airspeed limitations and ATC instructions.

Initial inbound altitude for noise abatement areas will be a descending path from 2,500 feet AGL or higher. Maintain minimum airspeed ($1.3V_s+20$ KIAS) with gear retracted and minimum approach flap setting.

At the final approach fix (FAF) or not more than 4 miles from runway threshold, extend landing gear. Final landing flap configuration should be delayed at pilot's discretion to enhance noise abatement.

During landing, use minimum reverse thrust consistent with safety for runway conditions and available length.

NBAA NOISE ABATEMENT PROGRAM SUMMARY

NBAA's Noise Abatement Program is not intended to describe all the various types of noise abatement policies followed by airport and aircraft operators, nor does it pretend to describe the "best" or "only" way to handle the problem of airport noise. However, it is an attempt to develop a generic approach for noise abatement procedures as a partial solution for the airport noise problem. Therefore, the following three points are stressed.

Noise abatement policies must be cooperatively developed and understood by aircraft and airport operators, engine and aircraft manufacturers and the local communities if such programs are to be effective.

At the time decisions are made to purchase and operate business jet aircraft, the aircraft operators surely will review what is available that would best satisfy their individual needs, but they also must thoroughly review aircraft types for performance characteristics in terms of noise generated and the impact on community noise levels. Many such aircraft have the ability to be flown within reduced noise specifications and business jet aircraft operators are strongly urged to utilize the procedures and techniques that permit them to do so.

A system of flight procedures is only one part of a complete noise abatement program. NBAA's recommend flight

procedures can be implemented immediately, and can result in a major reduction in the noise generated by turbojet business aircraft. However, there may be a tendency to use them beyond reasonable expectations as a means of effectively resolving the entire noise reduction issue. This tendency can be self-defeating, particularly if the general public is misled as to the effectiveness of flight procedures as the sole permanent solution to the overall noise problem. Therefore, aircraft operators continually must demonstrate to the general public that there is a genuine concern toward reducing aircraft noise and that the application of NBAA's noise abatement program will serve as a partial aid in this effort by standardizing flight procedures and by providing adequate safety margins.

2.14. Maintenance Away From Home Base

In general, maintenance away from home base can be separated into two areas of responsibility. The first occurs when the company has a maintenance manager or someone with responsibility for the aircraft's maintenance. The second occurs when no one fills that position. In either situation, the flightcrew should consult the MEL. Information on aircraft maintenance can be found in Section 4 of this *Management Guide*, titled Maintenance Operations.

MINIMUM EQUIPMENT LIST (MEL)

If an MEL has not been approved for that aircraft, FAR Section 91.213(d) permits a pilot to operate certain small aircraft with inoperative instruments and equipment without an approved MEL. However, a list of conditions presented in FAR Section 91.213(d) needs to be met. An example of such a condition would be if the FAA has *not* developed a master MEL for the aircraft.

If the FAA *has* developed a master MEL for the aircraft, the following inoperative instruments or equipment cannot be included on a company's MEL:

- Those required for VFR-day certification
- Those indicated as required on the aircraft's equipment list or Kinds of Operation Equipment List for the kind of flight operations being conducted
- Those required under FAR Section 91.205 or other applicable regulation
- Those required to be operational under an airworthiness directive

In addition, the inoperative instruments and equipment either must be removed from the aircraft, the cockpit control placarded and the maintenance recorded, or must be deactivated and placarded "Inoperative." The pilot or person who is certificated and rated to perform maintenance on the aircraft must determine that the inoperative instrument or equipment does not constitute a hazard to the aircraft.

MAINTENANCE PROCEDURES

If a maintenance manager or similar position exists, the flightcrew should consult the MEL and contact that person whenever a maintenance discrepancy occurs. The maintenance manager or company maintenance technician can help the flightcrew determine what needs to be done to return the aircraft to full operating condition. The maintenance manager should be familiar with the aircraft and be in a position to help procure necessary parts and appropriate manpower to reduce aircraft down time.

When a maintenance manager or other similar position does not exist, the flightcrew should consult the MEL, if the operator has one authorized by FAA, to determine if the discrepancy can be deferred. If so, the aircraft can proceed on to the next flight or to the home base where normal maintenance is performed. If the aircraft is not airworthy, an FAA-approved maintenance technician or repair facility must be contacted to obtain the necessary repairs. A special ferry permit may be necessary in order to fly to the proper repair facility.

2.15. Single Pilot Operations Under IFR

The *NBAA Bylaws* permit companies that use aircraft in the course of conducting business to be eligible for an NBAA Business Membership. Other requirements include:

- The company does not qualify for a Corporate Membership
- The pilot or pilots hold a currently valid commercial license and a currently valid instrument rating
- Each pilot or other flightcrew member completes a proficiency check at least annually.

As noted above, Business Members are permitted to operate an aircraft with a single pilot. The risk of an accident or incident in operations with a single pilot operating under IFR is significantly higher than operations with two pilots under IFR. NBAA realizes that some companies need to operate with a single pilot in operations under IFR; however, these operations place a considerable workload on the pilot. NBAA therefore recommends that the following precautions be taken in any single pilot operation under IFR.

- An autopilot with at least a heading hold feature should be used
- The pilot should have logged a minimum of 20 hours of instrument flight time in the particular make and model of the aircraft being flown
- The pilot must perform a detailed preflight plan of the intended route with associated charts and options
- The pilot should complete an instrument competency check every six months

Further guidance in this area may be found in FAR 135.163.

2.16. References for Flight Operations

This section lists additional references Members may access for more information.

Flight Operations Personnel Certificates, Ratings and Training

Advisory Circulars

- 61-89D – Pilot Certificates: Aircraft Type Ratings

FAA Orders

- 8700.1 General Aviation Operations Inspector's Handbook. Vol. 2, Chapter 9: "Conduct a Pilot Type Rating Certification."

Federal Aviation Regulations

- Part 61 – Certification: Pilots and Flight Instructors
- Part 67 – Medical Standards and Certification

ICAO Documents

- Annex 1 – Personnel Licensing

Publications

- National Business Aviation Association. *Management Guide*, Appendix C

Crew Training

Advisory Circulars

- 60-21 – Announcement of Availability: A Series of Aeronautical Decision Making Training Manuals
- 61-65C – Certification: Pilot and Flight Instructors
- 61-89D – Pilot Certificates: Aircraft Type Ratings
- 61-107 – Operations of Aircraft at Altitudes Above 25,000 feet MSL and/or MACH Numbers (MNO) Greater Than 0.75
- 103-4 – Hazard Associated with Sublimation of Solid Carbon Dioxide (Dry Ice) Aboard Aircraft
- 120-51B – Crew Resource Management Training

Federal Aviation Regulations

- Part 61 – Certification: Pilots and Flight Instructors: Subpart A – General; Subpart B – Aircraft Ratings and Special Certificates
- Part 135 – Operating Requirements: Commuter and On-Demand Operations: Subpart G – Crewmember Testing Requirements; Subpart H – Training

Crew Fitness and Health

Federal Aviation Regulations

- Part 61.14 – Refusal to submit to a drug or alcohol test.
- Part 61.15 – Offenses involving alcohol or drugs.
- Part 61.16 – Refusal to submit to an alcohol test or to furnish test results.

- Part 61.53 – Prohibition on Operation During Medical Deficiency
- Part 91.17 – Alcohol or drugs.
- Part 135.249 – Use of prohibited drugs.
- Part 135.251 – Testing for prohibited drugs.
- Part 135.353 – Prohibited drugs.
- Part 121, Appendix I – Drug Testing Program.
- Part 121, Appendix J – Alcohol Misuse Prevention Program

Flight, Duty and Rest Time Considerations

Federal Aviation Regulations

- Part 121 – Certification and Operations: Domestic, Flag and Supplemental Air Carriers and Commercial Operators of Large Aircraft: Subpart Q – Flight Time Limitations and Rest Requirements: Domestic Air Carriers; Subpart R – Flight Time Limitations: Flag Air Carriers; Subpart S – Flight Time Limitations: Supplemental Air Carriers and Commercial Operators
- Part 135 – Operating Requirements: Commuter and On-Demand Operations: Subpart F – Crewmember Flight Time and Duty Period Limitations and Rest Requirements

ICAO Documents

- Annex 6, Part 2, Ch. 4.14 – Flightcrew Fatigue and Flight Time Limitations

Crew and Passenger Relations

Advisory Circulars

- 120-48 – Communication and Coordination Between Flightcrew Members and Flight Attendants
- 121-24A – Passenger Safety Information Briefing and Briefing Cards
- 135-12A – Passenger Safety Information Briefing and Briefing Cards (FAR Part 135)

Federal Aviation Regulations

- Part 91.107 – Use of safety belts, shoulder harnesses, and child restraint systems.
- Part 135.117 – Briefing of passengers before flight.

Pilot-in-Command Authority

Federal Aviation Regulations

- Part 91.3 – Responsibility and authority of the pilot in command.

Standard Operating Procedures

Federal Aviation Regulations

- Part 91 – General Operating and Flight Rules: Subpart B – Flight Rules
- Part 97 – Standard Instrument Approach Procedures

- Part 135 – Operating Requirements: Commuter and On-Demand Operations: Subpart D – VFR/IFR Operating Limitations and Weather Requirements

Publications

- Airframe Manufacturer’s Flight Manual or Handbook.
- FAA Safety Alert for Operators 10008 – Ground Operations During the Hours of Darkness at Uncontrolled Airports

Landing Minimums

Federal Aviation Regulations

- Part 91 – General Operating and Flight Rules: Subpart B – Flight Rules
- Part 97 – Standard Instrument Approach Procedures
- Part 135 – Operating Requirements: Commuter and On-Demand Operations: Subpart D – VFR/IFR Operating Limitations and Weather Requirements

Maintenance Away From Home Base

Federal Aviation Regulations

- Part 21.197 – Special flight permits.
- Part 91.213 – Inoperative instruments and equipment.
- Part 43 – Appendix A, Major Alterations, Major Repairs, and Preventive Maintenance.

Single Pilot Operations Under IFR

Federal Aviation Regulations

- Part 135.163 – Equipment Requirements Aircraft Carrying Passengers Under IFR

3. INTERNATIONAL OPERATIONS

3.1. Introduction

Flying internationally, by its very nature, is more challenging and complex than domestic operations. Aircraft, crew and passengers will be subjected to the laws and requirements of two or more governments, the one where the aircraft is based and the state(s) into which the aircraft is traveling. Regulations, procedures and services vary from country to country, requiring planning, ingenuity, resourcefulness and most of all patience on the part of the flightcrew, dispatch and support staff. To minimize the impact of these variables and provide safe, secure and uneventful service, flight departments must put considerable effort into advanced planning.

This section is intended as a basic introduction and an overview of the international trip planning process. By reviewing the following guidelines developed and refined over a period of decades by NBAA and its International Operators Committee, flight departments should be able to identify many of the variables that can affect their operation.

However, in no way can these pages begin to replace the training necessary to undertake safe and efficient international and oceanic operations. Operators planning such flights (that is, any flight beyond the continental U.S., or CONUS) are strongly encouraged to avail themselves of the many professional training courses in international procedures available to the industry. The regulations and operational requirements beyond U.S. borders are not, and likely never will be, the same as U.S. requirements.

Beyond international training courses offered by industry providers, NBAA offers several other resources in support of international flights. Since 1973, NBAA has coordinated an annual International Operators Conference, which provides the most recent information from operators, planners and regulators based around the world. With an emphasis on regional briefings, this event deals with a broad range of current issues affecting international operations.

Additionally, the NBAA International Feedback Database, available online at www.nbaa.org/intl, provides a clearinghouse for flightcrew and dispatch comments. Available only to NBAA Members, the database can be searched by ICAO identifier, country, city, airport name or ICAO region. Members are encouraged to contribute their findings and observations to the database so that other operators have the benefit of first-hand reports about a given region.

More than ever, access to the Internet is vitally important to operators of international flights. Not only does it provide access to aviation resources worldwide, it also is a vital link to security news and information. Questions or com-

ments regarding international operations can be directed to members of the International Operators Committee listed at www.nbaa.org/committees or to NBAA's Operations Service Group at (202) 783-9250 or info@nbaa.org.

3.2. Personal Documentation

A U.S. flightcrew traveling abroad is required to carry all appropriate FAA certificates. Temporary certificates should be avoided. Additionally, a restricted radiotelephone operator's license issued by the Federal Communications Commission is required, even though this license no longer is required domestically. A passport is required for all international travel and should be valid for a period of at least six months at the time of arrival in a foreign country. Additional documentation germane to these issues, broadly defined as "facilitation," is outlined clearly in the recently revised *International Flight Information Manual (IFIM)*, which specifies passport, inoculation, visa and other requirements by country, and is available at www.faa.gov.

Another always current source is the *Travel Information Manual (TIM)* published by the International Air Transport Association (IATA) at www.iata.org, which gives monthly updates on passenger documentation requirements as well as the broad generic requirements found in ICAO Annex 9 on Facilitation (details are covered later in this section).

For U.S. operators, as of 2007, exceptions to passport requirements no longer are applicable. Unaccompanied children under the age of 18 must have written consent of a non-accompanying parent. Driver's licenses, birth certificates and voter registration cards are no longer valid proof of citizenship. Flightcrew and passengers must have a valid passport to reenter the U.S.

A complete listing of requirements for all states may be found in the IFIM's General Information, Passports and Visas section and the TIM.

Visas are endorsements normally appended to a passport and issued by the embassy or consulate of the country to be visited. These grant permission for the individual named on the passport to enter and exit that country. Some countries issue visas that grant multiple entries and others authorize only a single entry. If possible, NBAA recommends obtaining a multi-entry visa for maximum flexibility.

Commercial visa service companies can help travelers obtain these documents and are listed in the NBAA Member Directory, available only online at www.nbaa.org/directory, and in the Products & Services section of the NBAA web site at www.nbaa.org/prodsvcs. They also are listed in the classified telephone directory and most can be found on the web. Mexico and some other countries may be visited for short periods of time using tourist cards (similar to visas) issued by the country at the time and point of entry. Some ports of entry may require working visas for the flightcrews, and the IFIM and TIM should be consulted for details.

Positive identification of the flightcrew will enable entry into a country as well as airport access. The International Business Aviation Council, Ltd. (IBAC) offers an aircrew identification card that has become the standard for the industry. Customized aircrew cards are available to all NBAA Member flightcrews through NBAA's affiliation with IBAC. These cards conform to the requirements of International Civil Aviation Organization (ICAO) Annex 9 on Facilitation and can be obtained directly from IBAC at www.ibac.org.

When planning a trip to a foreign country, proper personal documentation for all participants – flightcrew and passengers alike – must be obtained. Some companies make current personal documentation the responsibility of the individual, but it is recommended that this responsibility, or at least final oversight, be placed with the aviation or travel department. Furthermore, coordination and oversight of passenger and flightcrew requirements, including documentation, is essential to safe and efficient international operations. NBAA recommends that aviation department management be responsible for ensuring that there are no oversights, because many countries, including the United States, hold the captain of the aircraft responsible for any improper documentation held by crew or passengers and can deny access.

In summary, personal documents that are normally required include a passport to verify citizenship, immunization records (recognized by the World Health Organization) to prove acceptable health and a visa to permit admission to the countries requiring them. In addition, NBAA recommends that flightcrew members obtain IBAC aircrew cards (or comparable ID cards) and display them while entering the airport and within its perimeter.

3.3. Aircraft Documentation

Aircraft also require documentation. The Federal Aviation Regulations require the following documents be carried onboard:

- Airworthiness certificate
- FAA Registration Form 8050-1 (not the temporary “pink slip”)
- Federal Communications Commission-issued aircraft radio station license (47 CFR, Part 87)
- Aircraft operator's handbook with specific weight, balance and aircraft noise information
- Any letters of authorization (LOAs) that apply to a flight in specified airspace

The International Civil Aviation Organization (ICAO) requires the following documentation:

- Certificate of registration
- Certificate of airworthiness

- Journey logbook as defined in FAA AC 91-70 and FAA Order 8900.1
- FCC radio station license
- When carrying passengers, a list of their full names, dates of birth, passport numbers and states of issue, and places of embarkation and destination
- When carrying cargo, a manifest and detailed declaration of the cargo

The airframe logbook, the engine logbooks and insurance certificates should be in the aircraft's onboard files. Some countries, such as Mexico, require that an operator carry a third-party insurance policy issued by a company within the country being visited. In those cases, an insurance certificate issued by that company is required on the aircraft. Additionally, war risk insurance is now mandatory in many countries. The operator's aviation underwriter should be contacted for additional details. Some countries require a signed corporate authorization on the operating company's letterhead authorizing such foreign flights. These should include the names of all crewmembers authorized to operate the aircraft on the company's behalf. Occasionally copies of the company's articles of incorporation will have to be provided as well before the aircraft may be operated in that country.

Operations in North Atlantic airspace, where minimum navigation performance specification (MNPS) airspace and reduced vertical separation minimum (RVSM) airspace exist, require a LOA from the FAA administrator. Export licenses and temporary sojourn licenses (as outlined in 15CFR 740.15) are required for travel to a limited number of U.S.-sanctioned countries. Export licenses may be obtained from the Department of Commerce's Bureau of Industry and Security, and more information can be found at www.treas.gov/offices/enforcement/ofac.

Operations in the Pacific in those areas specified as Required Navigation Performance (RNP10 or less) airspace require that the aircraft and operator be approved by the FAA administrator. The authorization process and requirements are contained in FAA Orders 8400.12A and 8400.10. The whole of the Pacific Region is designated as RVSM airspace. A single FAA-issued RVSM approval is all that is required to operate in any RVSM-designated airspace worldwide.

When aircraft have been manufactured abroad and are registered in the United States, a copy of the import duty receipt should be retained in the aircraft's onboard file. This receipt, which proves that the aircraft was legally imported into the U.S. and appropriate fees were paid, may be required to return to the U.S. without again being charged importation duty on the aircraft.

Specific country requirements for aircraft have historically been available in the IFIM. This reference is based on ex-

tractions of each ICAO country's Aeronautical Information Publication (AIP) and various other authoritative sources, but still only contains a limited amount of information. Additionally, the flightcrew must ensure that current and special notices relating to entry and overflight requirements, published in International Notices to Airmen (INOTAMs) and Notices to Airmen (NOTAMs), are followed. In most cases outside North America and Western Europe, prior permission to overfly and/or land in a country must be obtained directly from that country's civil aviation authority, and in some cases from security authorities as well.

The American Embassy in a destination country may be of assistance in some instances, but embassy resources can be limited when it comes to flight-technical issues. However, the embassy may be a required point of contact in other states; a list of these may be found at <http://usembassy.state.gov>. Landing within a country must be made at one of the designated airports of entry, which are listed in the ICAO Regional Air Navigation Plan, the IFIM or the country's AIP. In some cases, mandatory routes to be flown will be specified as well.

Depending on the country, receipt of overflight and landing permits can take anywhere from four hours to four weeks. Requirements vary from country to country. Therefore, action to obtain overflight and landing permits must be one of the first steps in planning any flight outside the United States. Once obtained, copies of permits should be kept onboard for in-flight reference and presentation when entering a FIR or upon landing, if requested.

U.S. Customs and Border Protection (CBP), previously known as the Customs Service and now a branch of the Department of Homeland Security, designates ports of entry, those U.S. airports where customs service is available. Ports of entry are listed in the *U.S. Customs and Border Protection Guide for Private Flyers* document found at www.cbp.gov.

3.4. Flight, Duty and Rest Time Considerations

Because international flights frequently cross many time zones in very short periods of time, crew rest requirements, including those of flight attendants and engineers, must be considered during the planning phase of the operation. As a rule of thumb, the average human body takes approximately 24 hours per time zone crossed to adjust its circadian rhythms to the local time zone. The time required to function normally can be extremely critical to safe flight operations. Additional information about flight, duty and rest time considerations can be found in the Flight Operations section of this *NBAA Management Guide*, as well as in Flight Safety Foundation (FSF) and National Aeronautics and Space Administration (NASA) publications.

As a safety precaution, new long-range aircraft often will require replacement crews staged in advance. Several factors need to be taken into consideration when choosing a technical stop with a crew change in mind. Ample commercial flights should be available to ensure flexibility in the staging of flightcrew. Coordination with the local authorities and/or handling agent needs to take place prior to the intended stop so that the crew arriving commercially can be properly cleared to the aircraft – a procedure not always well understood by local authorities that can become a point of confusion. The documentation required to enter a country via commercial aircraft can differ from that required to enter a country via business aircraft. It is important to verify in advance the requirements relating to a change of status for those getting on or off the business aircraft during a crew change.

3.5. International Flightcrew Training

There are several providers of qualified instruction in international procedures for operators undertaking international operations. For guidance on this topic or to find providers, attend the NBAA International Operators Conference or contact International Operators Committee members listed at www.nbaa.org/committees.

Such training is strongly recommended. A checklist of recommended subjects that meet the knowledge requirements for oceanic operations, including NAT MNPS LOAs for Part 91 operators, can be found in **Figure 3.2** at the end of this *NBAA Management Guide* section.

Operators must conduct initial and recurrent training in accordance with the type of operation being flown. Part 135 operators must conduct initial and recurrent training in accordance with their FAA-approved training manual. The FAA's guidance to its inspectors on international operations is now provided in FAA Order 8900.1, the Flight Standards Information Management System, or FSIMS (which has superseded the old General Aviation Operation Inspector's Handbook, Order 8700.1). Order 8900.1 contains guidance to FAA inspectors for approving LOAs for Part 91 operations. The FSIMS web site is located at <http://fsims.faa.gov>.

3.6. International Flight Planning Organizations

A wide range of services for international operators are available from professional firms that specialize in obtaining overflight and landing permits, security information, computerized flight planning, weather information, charts, NOTAMs, communications, flight following and ground handling for passengers, aircraft and crew.

The decision on whether to use such a firm, and which firm to use, could affect the outcome of an international trip. As noted in this section, international travel involves extensive

attention to detail that must be timely, correctly documented and properly acted upon. A trip that is not well planned can cause complications. NBAA therefore recommends that flight departments evaluate the use of flight-planning firms with international experience in conjunction with in-house planning resources. Many of these flight-planning firms are NBAA Associate Members and can be found in the NBAA Member Directory.

Other international business aircraft operators often are the best source of current information during the planning stages of an international flight. Contact information for NBAA Member Companies that have recently completed trips to foreign countries can be obtained from the International Feedback Database section of the NBAA web site at www.nbaa.org/intl.

3.7. Security Regulations and Other Considerations

Since the terrorist attacks of 9/11, security measures have increased significantly in the U.S. and worldwide. Business aircraft operators must maintain awareness of federal, regional and local security constraints to their operations. The U.S. Department of Homeland Security (DHS) and its Transportation Security Administration (TSA) oversee the development of security regulations within the U.S., and of course, these are layered on top of the FAA's regulations.

Other parts of the world also have established new regulations and these can affect international flight operations. Checking the TSA and FAA web sites and the NBAA Security web page at www.nbaa.org/ops/security for current NOTAMs and security notices is recommended, as they continue to change too frequently to list here.

Aside from familiarity with security regulations, the current worldwide political environment dictates that international business aircraft operators also be aware of other security considerations that could impact a flight. There are several sources for this type of information.

NBAA strongly recommends that, whenever possible, aviation departments coordinate security programs with the company's internal security division. Professional assistance from companies specializing in international aviation security is also available and should be considered. The Department of State provides information on travel to foreign countries from its Overseas Citizen Services Office, available online at <http://travel.state.gov>.

Information is also available from the Consular Information Section for each country listed at <http://travel.state.gov>, as well as in the IFIM, where there are consular information sheets on a state-by-state basis. A U.S. Embassy consulate in a particular country is another potential source of information, but not all consulates have aviation specialists, and the information they provide might not be highly technical. The

U.S. Department of State employs "country desk officers" to stay informed about potential political problems and can provide additional assistance.

The FAA Security Office and its international representatives also can help. International representatives are found at each FAA Regional Office and at the major U.S. embassies. The addresses of FAA regional offices and international field offices can be found online at www.faa.gov (see also the References for International Operations section below).

Information found in current international news sources, such as the *International Herald Tribune* (<http://global.nytimes.com>), can be beneficial for crew and planners who need to consider the political climate and security concerns of every destination in real time. Continual monitoring of a destination should take place not only during the planning stages of an operation but also during the operation itself. News sources available on the web as well as international TV news channels are indispensable to the international operator and should be used contemporaneously on all trips. There are also commercial companies that track and provide security information appropriate to the organization and the flight. Some of these companies are NBAA Associate Members and can be found in the NBAA Member Directory.

IBAC's aircrew identification card uniquely identifies crews of business aircraft to expedite their movement through facilitation processes and assist with ramp access and security improvements. For security purposes, IBAC limits distribution of aircrew cards only to those companies whose national and regional organizations (like NBAA) are currently affiliated with IBAC. For the latest list of IBAC member organizations and for crew card applications, visit www.ibac.org.

3.8. MNPS Airspace and RNP

The minimum navigation performance specification (MNPS) airspace found in the international airspace over most of the North Atlantic Region (NAT) from FL 285 to FL 420 is officially ICAO's airspace but is assigned for control purposes to the U.S., Canada, Iceland, Shanwick (UK) and Portugal. U.S.-registered aircraft must be approved by the FAA either in the form of a letter of authorization (LOA) or operations specification (OpSpec) to operate in this airspace. The approval is granted to the operator and its pilots as well as to the navigation and communications equipment installed on the aircraft meeting MNPS requirements. Changes in any of these three requires renewed authority.

Appendix C of FAR Part 91 describes the North Atlantic MNPS airspace. Flying in the NAT requires by law special navigation and communication capabilities, which are further outlined on the ICAO EUR/NAT Office site at www.paris.icao.int (under "Documents"). The specifics for opera-

tions in the NAT can be found in the ICAO Regional Supplementary Procedures, Document 7030, NAT/RAC section. The North Atlantic MNPS Airspace Operations Manual, available at the above site, also can be used as a guide to operations within the airspace.

The FAA's *North Atlantic International General Aviation Operations Manual* was first issued as an FAA Advisory Circular and revised most recently in 2004 by the North Atlantic System Planning Group (NATSPG). Although aimed at lower-altitude operations, it can serve as a good baseline reference that provides information not found elsewhere. Additional information can be obtained from FAA AC 91-49 and AC 91-70, where the U.S. requirements for obtaining MNPS operating authority are delineated.

Required navigational performance (RNP) describes the navigation performance necessary for operating within a defined airspace. Recently, it has become a subset of performance-based navigation (PBN). More guidance can be found at www.faa.gov (search for "RNP") and www.icao.int/pbn, which includes rudimentary online training. RNP specifications are established according to navigational performance accuracy in the horizontal plane (that is, lateral and longitudinal position fixing). The specific RNP type is identified as an accuracy value expressed in nautical miles and can range from RNP .3 or less to RNP 12.6 or more. In an RNP-12.6 environment (such as MNPS), airways are spaced 60 nm laterally; in RNP-10 (as in the PAC) by 50 nm; in RNP-5 (as in the European Union) by 30 nm; and so on. More information on RNP approach procedures is provided in AC 90-101, titled Approval Guidance for RNP Procedures With Authorization Required (AR), which can be found at www.faa.gov.

Implementation of RNP is one of the key elements identified by the ICAO to improve system capacity and allow airspace users to benefit from more direct routings and greater time and fuel savings. To date, RNP has been implemented in continental Europe, approximately as RNP-5 airspace, and is defined as basic area navigation (B-RNAV) capability.

U.S. operators can use AC 90-96 to determine conformity to required equipage and navigations system accuracy requirements, which allows operation in the designated airspace. Part 91 operators do not require formal approval; however, charter operators must get approval in their OpSpecs.

Some airspace in the Pacific has been designated as RNP-10. FAA approval in the form of either a LOA or OpSpec is required to operate in this airspace. Much of the future process is still to be worked out, but details regarding qualifying for operation within RNP airspace today can be found in several FAA documents.

European operations guidelines are in FAA AC 90-96, which states, in general, that if any of the following FAA ACs – 90-45A, 20-121A, 20-130, 20-130A, 20-138 and 25-15 – are

found in the aircraft flight manual, the aircraft qualifies for B-RNAV operations with no further requirements. The guidelines for airworthiness approval contained in these ACs provide aircraft navigation performance that is equivalent to RNP-5 or better. Additional information can be found at www.ecacnav.com/PRNAV.

For the Pacific or any other airspace requiring RNP guidance, additional information is in FAA Order 8400.12B, available at www.faa.gov, which designates procedures for obtaining the necessary LOA for such operations from a Flight Standards District Office. The order provides the requirements that enable an applicant to be approved as meeting the navigation elements required when RNP-10 is specified. Holders of a North Atlantic MNPS LOA automatically qualify but will need to have that block filled in by the FAA.

The business aviation community is beginning to see greater use of RNP applications in all types of airspace, including SAAAR approaches. Further information on RNP and PBN can be found on the NBAA web site at www.nbaa.org/ops/cns.

3.9. Ground Handling

In North America, operators are accustomed to the assistance of airport service organizations (ASOs), commonly known as fixed base operators (FBOs). However, with the exception of Western Europe, these facilities rarely exist at overseas destinations because most countries do not have enough general aviation traffic to support such dedicated ground support services. Therefore, the assistance of a ground handling agent is often required to procure and organize such services. Domestic, regional or international airlines with operations at a specific airport, as well as affiliates of U.S.-based flight-planning firms, can provide many of the necessary ground support services. Other agents can help with customs, immigration and public health procedures and can expedite the shipment of spares and provide aircraft maintenance.

Unlike in the United States, foreign ground handling agents, customs and fuel suppliers frequently operate out of separate facilities and will need to be coordinated independently by the operator or through a central coordinator. This precaution also pertains to any information updates, flight plans, weather, etc., sent to the particular airport of destination.

3.10. Fuel and Fueling

Fuel at airports outside the United States normally is supplied by either national or multi-national oil companies. In some cases, fuel sales are restricted to a government monopoly vendor. Some vendors can provide full services, such as overwing (gravity) or single-point (pressure) fueling capabilities and Prist (a jet fuel additive), but this cannot be assumed.

A company that plans to operate outside the United States should arrange for the method of fuel payment in advance. Some of the options available are direct billing; payment through a flight planning firm, a contract fuel agency or an international carnet (a type of international customs document); or payment via international credit card provided by international fuel companies. Domestic fuel credit cards might not be honored outside of the United States and its possessions.

In some parts of the world, especially developing countries, cash (local or hard currencies such as U.S. dollars or euros) is the preferred or only method of payment – new, clean bills may be all that is acceptable and change should not be expected. Traveler's checks are a safe way to transport funds, but they will cause delays in some locations where they are not accepted in lieu of cash. For security reasons, operators should avoid carrying large sums of cash.

A number of European countries have extremely high taxes on fuel uploaded by business aircraft. However, some countries will reimburse the amount of local taxes, commonly known as value added tax (VAT), paid by foreign-registered aircraft that are flown internationally. This type of information can be found only by directly contacting a local agent, handling agent or agency specializing in VAT reclamation. In recent years, fuel usually has been available worldwide, but real, political and labor-induced shortages can develop quickly anywhere.

3.11. Equipment Considerations

Various equipment considerations are necessary prior to operating outside the continental United States. These considerations include survival, communications (including automatic 406MHz ELTs) and navigation equipment requirements.

Survival Equipment. The survival equipment should be tailored to the terrain the aircraft will be transiting, i.e., polar, desert, maritime or jungle. 14 CFR 91.509 or 135.167, depending on the operation, should be consulted to determine minimum survival equipment requirements for extended overwater operations for large and turbine-powered multi-engine airplanes. For aircraft not ordinarily equipped with it, the appropriate survival equipment can be rented for the duration of a trip.

Flightcrew and passengers should be thoroughly familiar with the location and proper use of the equipment. NBAA recommends obtaining survival training from organizations experienced in providing such instruction prior to any extended overwater operation or flight over remote terrain.

For ditching or off-airport emergency landings, the aircraft manufacturer should be consulted about specific aircraft procedures. General considerations can be found in the *Aeronautical Information Manual (AIM)*.

Communications and Navigation Equipment. 14 CFR, FAR 91.511 or 135.165, depending on the operation, should be consulted to determine the minimum equipment requirements covering large and turbine-powered multi-engine airplanes on overwater flights of more than 30 minutes flying time or 100 nautical miles from the nearest shore. However, these requirements must be considered as reasonable for all overwater operations.

At a minimum, the following equipment should be carried:

- One high frequency (HF) transceiver per FAR 91.511, but 135.165 requires two HF transceivers for commercial operators. Consult the appropriate Federal Aviation Regulation.
- Two independent long-range electronic navigation units except in certain areas of the Western Atlantic (WATRS), the Caribbean Sea (CAR), the Gulf of Mexico and certain non-organized track system routes in the North Atlantic (NAT), where a single long-range navigation (SLRN) system will meet the requirements of FAR 91.511.
- Many operations in the WATRS, CAR and Gulf can be accommodated with the standard fit of two independent VHF communications transceivers as prescribed in FAR 91.511.

3.12. Aircraft Maintenance

The possibility of a discrepancy grounding the aircraft away from home base must be taken into consideration. The availability of maintenance outside the United States should be balanced against the need to carry spare parts and an aircraft technician on the flight.

Advanced planning includes knowing where to find foreign service representatives for a particular airframe, powerplant or component, and carrying those spares for the MEL items most likely to fail and ground the aircraft. The manufacturers of these items can be contacted for a list of approved dealers and repair facilities overseas. Experienced international operators often have a standard list of spares, including maintenance manuals and aircraft logs, for their particular aircraft, which always are carried on extended international flights. Storing these documents in an electronic flight bag (EFB) can be helpful. For extended trips in which an aircraft will execute many legs, and for flights into airports that are far from any maintenance capabilities, the aircraft should depart with new rubber components and all items at peak levels.

A list of FAA-approved maintenance bases outside the United States and foreign repair stations can be obtained from the FAA. An operator should be aware that maintenance technicians licensed outside the United States normally need a specific type endorsement on their domestic certificate to work on a specific type of aircraft.

Additional information about business aviation maintenance issues is provided in the Maintenance Operations section of this guide.

3.13. User Charges and Handling Fees

Direct operating costs are higher for international operations than domestic U.S. operations. When a business aircraft flies internationally, it generates direct charges in the form of user fees. Such fees are in addition to fuel taxes that are similar to but normally greater than those accrued in the United States.

User fees for international trips normally are broken down into navigation, communication, landing and handling fees, but they may be described on the invoices by various terms. There are a number of programs available to cover credit at most international locations. NBAA recommends that flightcrews do not carry more than necessary cash on international trips, and U.S. Customs and Border Protection limits the amount to \$10,000 per person without reporting it.

Domestic fuel credit cards normally are not accepted. In some cases, direct billing can be arranged in advance and some fuel companies can provide international fuel carnets. American Express, Visa and MasterCard all are recognized to a greater or lesser degree, depending upon the location, as are many of the aviation-specific cards, including Air BP Sterling Card, Air Routing Group Card, AVCARD, BaseOps/World Fuel Aviation Services Card, Jeppesen World Fuel Services Card, MultiService Card, UVAIR Card and others.

The ICAO publication, Manual of Airport and Air Navigation Facility Tariffs, Doc 7100, provides approximate charges made by governments for the use of their aviation infrastructures. However, the fees provided are two years behind current rates and can be used only as a general guide to expected costs.

In Western Europe, most airway enroute charges are billed through the Eurocontrol Route Charges Office, and additional information can be found at www.eurocontrol.int (keyword "Central Route Charges Office"). Charges assessed for ground handling and other services rendered to business aircraft vary widely but generally are based on aircraft size and/or weight factors and services required. The national or airport authorities or the local handling agencies may collect these fees. In Europe, most ground handlers subscribe to the European Business Aviation Association's (EBAA's) Handling and FBO Code of Practice; see www.ebaa.org.

Schedules of services and charges can be approximated by contacting the ground handling agent or service facilities at the airport. Fuel prices vary widely and change frequently. Prices range from half to more than twice what is charged in the United States at any given time. At times, tankering of fuel may be advisable because additional taxes in some locations can boost actual fuel costs by up to 300 percent. Additionally, regardless of the source of charges,

statements should be audited carefully, not only for specific charges but also for the authenticity of the statement itself – even if it appears to be an official government document.

If service fees are billed, these efforts often are confounded by less than timely distribution of invoices, often three to six months or more after the flight. Because of these delays, it is important to retain all receipts and maintain good contemporaneous records of all flights. If an error is found, most agencies are willing to make adjustments when it is brought to their attention.

3.14. Inspection Agencies (Facilitation)

No matter where flightcrews go, they will have to deal with government agencies when they enter (and often when they exit) a country, including the United States. These agencies are customs, immigration and frequently agriculture and quarantine, known generically as facilitation or in some places simply as CIQ (customs immigration and quarantine). The procedures to be followed will be in accordance with the statutes of the country being entered (or exited) and generally are outlined in the IFIM, but additional, and very specific passenger information, can be found in the TIM and more broadly in ICAO Annex 9.

In this International Operations section of the *NBAA Management Guide*, the term "customs" is used to refer to a country's Customs agency, which in the U.S. is the Customs and Border Protection (CBP) agency, a subset of the U.S. Department of Homeland Security.

Since becoming effective in May 2009, eAPIS (Electronic Advanced Passenger Information System) requires advanced notification to the CBP of details surrounding each aircraft's international arrival and/or departure. This electronic passenger vetting system holds the pilot-in-command responsible for inaccurate and/or missing information.

Additionally, ESTA (Electronic System for Traveling Authorization) has been recently adopted by the CBP as a means to streamline the processing of passengers visiting the United States under the Visa Waiver Program. Passengers will be issued a unique reference number, renewable every two years.

A business aircraft leaving the United States under FAR Part 91 is not required to clear U.S. customs outbound (FAR Part 135 are), but if passengers or crew are carrying \$10,000 or more per person in cash or negotiable instruments, they are required to make a customs declaration on Form 4790, the Report of Currency and Other Monetary Instruments, before departure. With regard to reentering the United States, the relevant requirements may be found in Title 19 of the Code of Federal Regulations, Customs Duties section, the *U.S. Customs and Border Protection Guide for Private Flyers* and the IFIM. It is necessary to buy a sticker annually from CBP indicating that the necessary customs user fee has been paid.

Local variations might exist in procedures unique to a region, district or port of entry. Because frequently no documentation is provided to give evidence that an aircraft and flightcrew have been inspected, or have otherwise complied with the rules, the flightcrew should record the name and/or badge number of all inspection personnel they deal with and keep this information on file. U.S. and other customs regulations differ for private and commercial aircraft operations and are not the same as those used by the FAA (note the next paragraph). The flightcrew needs to know its status relative to facilitation requirements and be able to prove its status.

For most customs purposes, and in the broadest terms, a private aircraft is any civilian aircraft not being used to transport persons or property for compensation or hire. However, for reporting purposes only, commercial air taxi and air charter carriers operating aircraft with a seating capacity of 30 passengers or less or a maximum payload capacity of 7,500 pounds or less, which are engaged in air transportation for compensation or hire on demand and arriving from areas south of the United States, must comply with the reporting requirements for private aircraft; in other words, aviation law does not necessarily have any effect on customs law.

In most cases, the criterion for determining whether an aircraft is private or commercial is defined by the use of the aircraft on a particular flight, and this applies whether the owner or lessee is a corporation, partnership, fractional owner, sole proprietorship or an individual. An aircraft is presumed not to be carrying persons or merchandise for hire, and thus will be a private aircraft for customs purposes, when the aircraft is transporting only the owner, the aircraft owner's employees, invited guests or the owner's property.

The U.S. CBP user fee is levied on a per aircraft per annum basis. For commercial operators, overtime is charged for inspection services performed after working hours, on Sundays and on holidays. Customs fees may be paid in cash, check or against a customs surety bond. Such bonds are mandatory for commercial operators in the United States.

The flightcrew is responsible for notifying customs directly and in advance of an intended arrival. Additionally, "AD-CUS" ("advise customs") should be noted in the remarks (RMK) section or "Other Information" area of the international flight plan as a secondary notification to customs.

Before selecting an airport for arrival in the United States, the airport's customs status must be known and appropriate timely requests must be made based on the following definitions.

- An *international airport* is any airport designated by CBP as a port of entry (POE) for civil aircraft. Simply the name of an airport does not inform its status as a legitimate port of entry. No advanced permission is required, but in most cases advanced notice of arrival is.

- A *landing rights airport* (LRA) means any airport where permission to land may be granted by customs. The current 19 CFR, Part 122 and the *U.S. Customs and Border Protection Guide for Private Flyers* will contain the latest published customs information, including a list of telephone numbers for all airports providing customs inspection in the United States.
- *User fee airports* are so named because the costs associated with them are reimbursable by the user of the services. Private aircraft operators using designated CBP user fee airports are usually required to reimburse the airport operator for the costs associated with processing their arrivals. These costs may add up to several hundred dollars per arrival.
- *Designated airport* – Private aircraft originating in a foreign location south of U.S. borders are required to furnish a notice of intended arrival in compliance with the special reporting requirements discussed above. In this case flights must land for customs processing at a designated airport nearest the border or coastline crossing point unless the aircraft has been exempted from this requirement; then they must be inspected at their first point of landing. In addition to the requirements outlined in this section, private aircraft commanders must comply with all other landing and notice-of-arrival specifications. These landing requirements do not apply to private aircraft that have not landed in a foreign place or that are arriving directly from Puerto Rico or other U.S. territories.

Special regulations exist (generated by the United States anti-drug and anti-terrorist efforts) that relate to advanced reporting of border penetration and that identify specific airports along that border where landings must be made for inspection. Southern U.S. border crossing procedures require additional knowledge. Refer to the *U.S. Customs and Border Protection Guide for Private Flyers* regarding special requirements for entering from Mexico and the Caribbean.

This is particularly significant for operators of reciprocating engine aircraft. Those companies that operate into or out of Cuba also are subject to additional special regulations and should consult 14 CFR 91.709.

When returning to the United States from any foreign country or when entering an air defense identification zone (ADIZ), flightcrews must provide advanced reporting of the penetration. These regulations are found in the 19 CFR, Section 122.23 and the CBP's *Guide for Private Flyers*. Additional information on this program and other CBP programs is available at www.cbp.gov.

3.15. Customs and Cabotage

Business aviation can provide transportation for non-commercial operations (defined by FAR Part 91 in the United States) anywhere in the world. However, a hodgepodge of aviation, immigration, customs and economic regulations

applied by individual countries – and in the case of the European Union (EU), a region – can keep this from being an easy process.

Cabotage is the practice of providing public transportation for passengers, mail or cargo between two points in a country that is other than the aircraft's country of registry. Although the term "cabotage" technically applies to commercial operations – that is, flights for remuneration or hire – this definition applies to the industrial or commercial benefit transport of goods, whether or not for remuneration. It is within the rights of each ICAO contracting state to allow so-called "eighth freedom" (i.e., cabotage) flights, and the processes involved should be defined in their national AIP or synopsis found in the IFIM. But the laws of some states define a corporate operation (falling under FAR Part 91 in the U.S.) as commercial for these purposes.

Where any state denies cabotage rights, the customs duty status becomes irrelevant. Cabotage without permission of the state is prohibited under Article 7 of the Chicago Convention.

Customs regulations and restrictions vary by individual state. In the U.S. this information is available in the *U.S. Customs and Border Protection Guide for Private Flyers*, which includes a copy of the relevant parts of 19 CFR, Custom Duties, Part 122, that apply to air commerce. In the EU all countries are legally bound to follow the EC Customs Code 2454/1993, which allows the temporary admission of a means of transport under certain conditions. The EU itself is also party to the Istanbul Convention on Temporary Admission, which further defines the conditions by which one can bring a means of transport into a customs territory.

Generally, private flight is restricted to a maximum stay of six months within a 12-month period under temporary admission in any customs territory. It is possible that an aircraft technically could be allowed under the state's AIP to carry out an eighth-freedom flight but still be in breach of that state's customs temporary importation conditions (e.g., overstaying the "six-months-in-twelve" rule). Being in breach may impose customs duties and VAT based on the present value of the aircraft at current rates for the state in which the aircraft is operating.

In general, aircraft registered outside a customs territory that are owned, leased or mortgaged in the name of persons resident or established outside that customs territory are required to carry a copy of the appropriate title or lease agreement showing the connection between the passengers and the registered owner. Additionally, a letter of authorization on company letterhead should be onboard, listing any person(s) resident to a customs territory in which the aircraft will operate and indicating that they are either employees or guests on the aircraft. And finally, operators must ensure that aircraft do not exceed the six-months-in-twelve rule.

For commercial (FAR Part 135) operations, a charter permit from the national authority (DGAC) is required to carry out a flight from each contracting state into which a flight is to be made. In the EU, the code allows internal flights where national transport provisions are in place.

For private operations, however, many countries do allow a local passenger to be picked up and accompany an individual already onboard as long as the guest's presence is purely coincidental and is not the purpose for the flight. A country's customs office normally enforces these rules and will be the final arbiter. The IFIM contains some information on cabotage and customs under the Corporate Aircraft Constraints sections on each country page, but it is not a complete reference. More importantly, consultation with the local service provider in the country being traveled to is recommended for the latest local interpretation of these issues.

In light of the changing environment within the EU, the issue of VAT and the definition used to define commercial operations of an aircraft becomes a complicated issue. These rules may be applied to transporting any EU citizen across any of the countries in the EU, including transportation of company personnel on company business within the EU. These matters should be discussed with a VAT reclamation specialist to divert any potential problems that might arise. The issue can be avoided under certain circumstances through the process of temporary or permanent importation of an aircraft into a EU country.

NBAA recommends contacting those personnel experienced in handling this process to properly address each company's specific circumstances. The Association has contacts with firms that have expertise in these areas and many may be found in the NBAA Member Directory.

3.16. U.S. Military Airfields

Business aviation operators are permitted to use some military airfields both in and outside the United States. Airfields located outside the U.S. can be used in some instances for technical stops while ferrying or positioning flights that do not carry passengers. However, it is necessary to obtain special written permission prior to the flight (known as PPRs). The PPR for the use of a military field will require a civil aircraft hold harmless agreement and original copies of certificates of insurance issued by the operator's insurance carrier. Procedures specified for U.S. airfields in the U.S. AIP should be followed and allow six weeks for processing. Contact information for the U.S. Navy and U.S. Air Force are provided later in this guide.

3.17. International Business Aviation Council

The International Business Aviation Council (IBAC) was founded in 1981 to represent the interests of business aviation worldwide. It is an International Non-Governmental Organization (INGO) with permanent observer status with the International Civil Aviation Organization (ICAO), the United Nations agency for aviation matters. NBAA was a founding member of IBAC, and through NBAA's IBAC membership, NBAA Members gain affiliate status to the council.

IBAC's offices are in the ICAO Building in Montreal, Quebec. A list of IBAC members is provided at the end of this *Management Guide* section, and additional information is provided at www.ibac.org.

IBAC's purpose is to:

- Provide through the cooperation of the member organizations a pool of knowledge, experience and general information in all aspects of international business aircraft operations on which member organizations can draw for the benefit of their own members.
- Undertake all activities appropriate to ensure that the needs and interests of business aviation on an international scale are clearly presented to, and understood by, those national and international authorities and organizations whose responsibilities include any administration that may influence the safety, efficiency or economic use of business aircraft operating internationally.
- Attempt to attain, through all appropriate means, ever-widening recognition of the fact that international operations conducted by business aircraft are of primary importance to the economy and well-being of nations across the globe. To that end, it is a purpose of the council to bring operators of business aircraft into closer, mutually supportive personal and institutional relationships.
- Support the United Nations and its agency, the International Civil Aviation Organization (ICAO) and as circumstances permit, participate in the various activities and work of ICAO. The council defends the basic concepts set forth in the Preamble to the 1944 Chicago Convention on International Civil Aviation.
- Encourage the formation of independent national organization for the purpose of representing the interests of companies owning or operating private category business aircraft for purposes generally recognized as not for hire, reward or compensation.

IBAC and its member associations, including NBAA, developed the International Standard for Business Aircraft Operations (IS-BAO), a code of best practices designed to help flight departments worldwide achieve high levels of safety and professionalism. NBAA recommends that all flight operations, regardless of size, implement IS-BAO as an active

means of mitigating risk. Operators following IS-BAO also meet the applicable International Civil Aviation Organization standards, which in some cases may exceed those required for U.S. operations under the FARs.

For more information about IS-BAO, visit www.nbaa.org/is-bao.

3.18. NBAA Resources for International Operators

The NBAA International Operators Committee is composed of NBAA Member Representatives that have experience and/or interest in international operations. The committee designates eight regional leads (by ICAO regions) that act as monitors in their areas of operational expertise. The committee's regional lead coordinator directs the group's efforts in conjunction with the committee chairman, vice chairman and staff liaison to obtain maximum effectiveness in dealing with international issues. It is the information gained from these regional contributions that forms the basis for NBAA's yearly International Operators Conference, which covers the wide variety of issues involved in the international operation of business aircraft.

NBAA does not attempt to duplicate services that are available from other sources (e.g., facilitation, flight planning, flight following, security or training organizations). Instead, the Association facilitates the collection and dissemination of time-critical information to its Members through the NBAA International Feedback Database at www.nbaa.org/intl. Flightcrews are encouraged to provide operational feedback to the database after each international trip to keep the system active and viable.

NBAA's International Operations Checklist, **Figure 3.1**, should be used to verify the basic elements that should be considered for a safe, secure and efficient international flight. The following items are provided to emphasize the critical elements of any international operation.

- Take nothing for granted.
- Always telephone, fax or e-mail the next stop, handler or operations department as appropriate to ensure that all arrangements have been made. Insist on written confirmations from all agencies wherever possible and keep them available in the cockpit.
- Attempt to talk to someone who recently has made the same or similar trip. Check NBAA's International Feedback Database for contacts.
- Seriously consider using an international planning organization.
- Know current and forecasted weather and INOTAM information.

- Establish procedures to facilitate flight following and crew communications for maintenance and other possible problems.
- Establish procedures for crew or passenger illnesses.

For additional recommendations from the NBAA International Operators Committee, review **Figure 3.2**.

3.19. References for International Operations

ICAO Documents

International Civil Aviation Organization (ICAO) publications are listed online at www.icao.int. Publications also can be ordered from: ICAO, Attention: Document Sales Office, 999 University Street, Montreal, Que. H3C 5H7, Canada; tel: (514) 954-8022; sales@icao.int.

ICAO publications include:

- Catalogue of ICAO Publications and Audiovisual Training Aids
- ICAO Document 7030 – ICAO Regional Supplementary Procedures
- ICAO Document 4444 – Procedures for Air Traffic Management
- Annex 2 – Rules of the Air (contains International Flight Rules)
- Annex 5 – International Standards of Measurements
- Annex 6 – Operation of Aircraft
 - Part I – International Commercial Air Transport
 - Part II – International General Aviation Aeroplanes
- Annex 9 – Facilitation
- Annex 17 – Security
- ICAO PANS (Procedures for Air Navigation Services)
 - PANS OPS – Aircraft Operations – Doc 8168 (Vol. I Flight Procedures and Vol. II Construction of Visual and Instrument)
 - PANS ATM (Air Traffic Management) – Doc 4444
- Manual of Airport and Air Navigation Facility Tariffs – Doc 7100
- Convention on International Civil Aviation – The Chicago Convention – Listing of the 96 Articles – Doc 7300

Federal Aviation Regulations

- FAR Part 91, Appendix C – Operations in the North Atlantic (NAT) Minimum Navigation Performance Specifications (MNPS) Airspace
- FAR 91.509 – Survival Equipment for Over-Water Operations

- FAR 91.511 – Radio Equipment for Over-Water Operations
- FAR Subpart H – Foreign Aircraft Operations and Operations of U.S. Registered Civil Aircraft Outside of the United States, and Rules Governing Persons on Board Such Aircraft
- FAR 91.703 – Operations of Civil Aircraft of U.S. Registry Outside of the US
- FAR 91.705 – Operations Within Airspace Designated as Minimum Navigation Performance Specifications Airspace

Note: The above FAA documents all are available on two web sites: the Code of Federal Regulations (CFR) main page at www.gpoaccess.gov/cfr or the Electronic Code of Federal Regulations (e-CFR) web site at www.gpoaccess.gov/ecfr.

FAA Advisory Circulars

The FAA maintains all advisory circulars (ACs) online at www.faa.gov.

- AC 91-49 – General Aviation Procedures for Flight in North Atlantic Minimum Navigation Performance Specifications Airspace
- AC 90-79 – Recommended Practices and Procedures for the Use of Electronic Long-Range Navigation Equipment
- FAA Advisory Circular 90-96 – Approval of U.S. Operators and Aircraft to Operate Under Instrument Flight Rules (IFR) in European Airspace Designated for Basic Area Navigation (BRNAV/RNP-5)
- AC 120-33 – Operational Approval of Airborne Long-Range Navigation Systems for Flight Within the Minimum Navigation Performance Specifications Airspace
- AC 150/5000-5C – Designated U.S. International Airports

Other FAA Publications and Web Sites

- FAA Regional Offices, www.faa.gov/about/office_org/headquarters_offices/ash/ash_offices/
- FAA International Field Offices, www.faa.gov/about/office_org/field_offices/ifo
- International Notices to Airmen, www.faa.gov/ntap
- *International Flight Information Manual* (IFIM), www.faa.gov (designated URL for this newly revised publication not yet available as of October 2010)
- *United States Aeronautical Information Manual* (AIM), www.faa.gov/ATPUBS/AIM
- *North Atlantic International General Aviation Operations Manual*, www.faa.gov/air_traffic/publications/atpubs/NAO/NAOTOC.htm
- Pacific CNS Requirements, www.faa.gov/about/office_org/headquarters_offices/ato/service_units/enroute/oceanic/

- Oceanic and International Operations, www.faa.gov/documentLibrary/media/Advisory_Circular/AC%2091-70A.pdf
- FAA Order 8400.12B, Required Navigation Performance 10 (RNP-10) Operational Approval, www.faa.gov/documentLibrary/media/Order/8400.12B.pdf
- Flight Standards Information Management System (FSIMS), <http://fsims.faa.gov>

Additional Publications and Web Sites

- *NBAA Oceanic Flying Operations and Procedures Manual*, www.nbaa.org/prodsvcs/store
- *U.S. Customs and Border Protection Guide for Private Flyers*, <http://www.cbp.gov/xp/cgov/newsroom/publications/travel/>
- *Travel Information Manual (TIM)* from International Air Transport Association, www.iata.org/ps/publications/tim.htm
- *Airports and Handling Agents*, Jane's Information Group
- Individual state Aeronautical Information Publications (AIPs)
- ICAO's "Guidance Material on the Implementation of 300m (1000 ft.) Vertical Separation Minimum in European RVSM Airspace" document
- ICAO Performance Based Navigation site, www.icao.int/pbn
- *North Atlantic MNPS Airspace Operations Manual*, www.paris.icao.int/documents_open/subcategory.php?id=106
- North Atlantic International General Aviation Operations, on the North Atlantic Programme Coordination Office web site, www.nat-pco.org
- NAT Volcanic Activities, www.nat-pco.org/Volcanic.htm
- National Climatic Data Center's "Global Gridded Upper Air Statistics"
- "Preparing for Your First International Op," *Business & Commercial Aviation*, David Esler, March 2007

Government Services

FAA international representatives are found at all regional offices, international field offices and U.S. embassies in the following countries: Belgium, Brazil, France, Italy, Japan, Jordan, Senegal, Singapore and the United Kingdom.

The international mailing address and office location for the FAA Europe, Africa and Middle East office are listed below and others may be found at www.intl.faa.gov (click on "Contact").

FAA EU Office Location:
15 Rue de la Loi, 3rd Floor
B-1040 Brussels, Belgium
Tel: 32-2-508-2700
Fax: 32-2-230-0642

FAA EU Mailing Address:
FAA
c/o American Embassy
27 Boulevard du Regent
B-1000 Brussels, Belgium

The U.S. Department of State provides information on travel to foreign countries at the following address:

Citizens Advisory Center
Room 4800
21st and C Street
Washington, DC 20520
Tel: (202) 647-5225 (hotline)
Tel: (202) 647-8001 (aviation contact)
Fax: (202) 647-6201
Web: www.state.gov or www.state.gov/www/about_state/contacts/keyofficer_index.html for a list of Foreign Service Offices in countries throughout the world.

The Department of Treasury provides information on Customs and Directive No. 3100-10, Landing Rights for Aircraft, at the following address:

U.S. Bureau of Customs and Border Protection (CBP)
Office of Passenger Program Division
1300 Pennsylvania Ave. NW
Washington, DC 20229
Tel: (202) 927-0530; (202) 927-0167
Fax: (202) 927-1435
Web: www.cbp.gov

The Centers for Disease Control
1726 M Street, NW Suite 1100
Washington, DC 20036
24-Hour International Travelers' Hotline:
(877) 394-8747
Web: www.cdc.gov

World Health Organization (WHO)
Pan American Health Organization
525, 23rd Street NW
Washington, DC 20037
Tel: (202) 974-3000
Fax: (202) 974-3663
E-mail: postmaster@paho.org
Web: www.who.int or www.paho.org

The U.S. Department of the Navy and the U.S. Department of the Air Force can be contacted for permission to use their facilities. These departments can be contacted regarding a "Civil Aircraft Hold Harmless Agreement" and other details.

Department of the Navy Naval Facilities Engineering
Command Headquarters

Washington Navy Yard
1322 Patterson Ave. SE
Suite 1000

Washington, DC 20374-5065
Tel: (202) 685-9202

Department of the Air Force
Headquarters USAF/X00-CA
1480 Air Force Pentagon Room 4D1010
Washington, DC 20330-1480
Tel: (703) 697-5967

Business Aviation Organizations

Below is contact information for the International Business Aviation Council (IBAC) and its 15 member organizations.

International Business Aviation Council, Ltd.
Based in Montreal, Que, Canada
Tel: (514) 954-8054
E-mail: info@ibac.org
Web: www.ibac.org

National Business Aviation Association, Inc. (NBAA)
Based in Washington, DC
Tel: (202) 783-9000
E-mail: info@nbaa.org
Web: www.nbaa.org

Asian Business Aircraft Association (AsBAA)
Based in Macau SAR, China
Tel: +853 (2886) 1116
E-mail: cwoods@jetasia.com
Web: www.asbaa.org

Associação Brasileira de Aviação Geral (ABAG)
Based in São Paulo, Brazil
Tel: +(55) (11) 5032-2727
E-mail: mail@abag.org.br
Web: www.abag.org.br

Australian Business Aircraft Association (ABAA)
Based in Cremorne, NSW, Australia
Tel: +61 (2) 9953 0363
E-mail: abaadbell@optusnet.com.au
Web: www.aba.com.au

British Business and General Aviation Association (BGAA)
Based in Brill, Aylesbury, UK
Tel: +44 (0) 1844 238020
E-mail: info@bbga.aero
Web: www.bbga.aero

Business Aviation Association for India (BAAI)
Based in New Delhi, India
Tel: +91 (11) 26142575
E-mail: info@baai.org

Business Aviation Association for Southern Africa (BAASA)
Lanseria, South Africa
Tel: +27 (11) 805 0680
E-mail: caasa@iafrica.com
Web: www.caasa.co.za

Canadian Business Aviation Association (CBAA)
Based in Ottawa, ON, Canada
Tel: (613) 236-5611
E-mail: info@cbaa.org
Web: www.cbaa.org

European Business Aviation Association (EBAA)
Based in Bruxelles, Belgium
Tel: +32-2-766-0070
E-mail: info@ebaa.org
Web: www.ebaa.org

European Business Aviation Association – France
(EBAA France)
Based in Le Bourget Cedex, France
Tel: 33 (1) 49 34 22 31
E-mail: ebaafrance@aol.com
Web: www.ebaafrance.aero

German Business Aviation Association (GBAA)
Based in Berlin, Germany
Tel: +49-(0) 8 32 90 07
E-mail: ceo@gbaa.de
Web: www.gbaa.de

Italian Business Aviation Association (IBAA)
Based in Milano Linate, Italy
Tel: +39 02 76-11-0952
E-mail: segreteria@ibaa.it
Web: www.ibaa.it

Japan Business Aviation Association (JBAA)
Based in Tokyo, Japan
Tel: +81-3-5785-5963
E-mail: webmaster@jbaa.org
Web: www.jbaa.org

Middle East Business Aviation Association (MEBAA)
Based in Dubai, UAE
Tel: +971 (4) 319 9013
E-Mail: ali.alnaqbi@mebaa.com
Web: www.mebaa.com

Russian United Business Aviation Association (RUBAA)
Based in Moscow, Russia
Tel: +7 (495) 363 6252
E-mail: koshelev@stln.aero
Web: www.rbaa.ru

Figure 3.1: NBAA International Operations Checklist

I. Documentation

- A. Flightcrew (current and qualified in international operations)
1. CFIT Evaluation, see www.flightsafety.org/cfit1.html
 2. Trip itinerary
 - a. Passenger manifest (full name, citizenship and date of birth, passport number and visas as required for manifests and general declarations)
 3. Laptop computer and cell phones with appropriate modems, current URLs and e-mail addresses, and worldwide ISP access
 4. Identification
 - a. FAA airman's certificates, including pilots certificate (with type or SEC rating) and first class medical (to the date)
 - b. FCC certificates
 - c. Passports (current with visas as required). Note: Driver's licenses and voter's registration cards no longer acceptable
 - d. IBAC aircrew ID cards
 - e. IBAC aircrew luggage tags
 5. CBP (customs) forms
 - a. Private Aircraft Enforcement – eAPIS filing for the U.S. in and out
 - b. General declarations in compliance with Annex 9 for most non-U.S. countries
 6. Health
 - a. Immunizations
 - b. Immunization records (as required)
 - c. Information about current influenzas, pandemics, etc.
 - d. Medical assistance plan
 7. Aircraft documents (ARROW)
 - a. Airworthiness certificate
 - b. Radio licenses
 - c. Registration (not "pink slip" Form 8050-1)
 - d. Aircraft flight manual (including a noise statement)

- e. Weight and balance information
 - f. LOAs
 - MNPS airspace
 - RVSM airspace
 - RNP airspace (as required)
 - FANS airspace (as able)
 - ADS-B (where required)
 - g. Insurance (appropriate for destinations and operations)
 - h. Minimum equipment list
 8. Metric conversion tables (with preconverted aircraft size and weights)
 9. Journey logbook (see FAA Order 8900.1)
 10. Certificates of insurance (U.S., international, foreign and war risk, as applicable)
 11. Import papers for aircraft of foreign manufacture
 12. Long-range navigation (one at least; see 91.511)
 13. Systems manuals
- B. Passengers
1. Trip itineraries
 2. Passenger manifest(s) (full name, citizenship and date of birth)
 3. Current passports (with visas as required)
 4. Health
 - a. Immunization records (as required)
 - b. Information about current influenzas, pandemics, etc.
 - c. Medical assistance plan
 5. Traveler's checks and cash (more than \$10,000 per individual is legal but must be declared to U.S. CBP before going out and inbound)

II. Operations

- A. Permits (as applicable)
1. eAPIS
 2. Overflight and landing
 3. Export licenses
 4. Diplomatic licenses
 5. Military "Aircraft Hold Harmless Agreement"
- B. Services
1. Inspections
 2. Customs
 3. Immigration
 4. Agricultural (quarantine)

5. Ground security
 6. Catering
 7. Handling agents
 8. ASO and FBO arrangements
 9. Fuel (credit cards, carnets and contracts)
 10. Prist
 11. Anti or de-ice
- C. Maintenance
1. Technician
 2. Flyaway kit (spares and tools)
 3. Fuel contamination check kit
 4. List of FAA foreign repair stations for aircraft make and model
- D. Financial
1. Credit cards, carnets and contracts
 2. Letters of credit
 3. Banks
 4. Servicing air carnets
 5. Handler(s)
 6. Fuelers
 7. Cash and traveler's checks (more than \$10,000 per individual is legal but must be declared to U.S. Customs before going out or inbound)

III. Communications

- A. Equipment
1. VHF (8.33 kHz)
 2. HF
 3. Headphones
 4. Two Microphones
 5. SELCAL
 6. Portables (e.g., ELTs, VHF and SAT comm)
 7. ELTs (406MHz automatic in aircraft)
 8. SATCOM
 9. Mode S
 10. ADS-B
 11. GSM phones
 12. Awareness of current sun spot activity
- B. Agreements (as needed)
1. ARINC
 2. SITA
 3. British Telcom International
 4. INMARSAT (COMSAT)
 5. IRIDIUM

IV. Navigation

- A. Equipment
1. VOR
 2. DME

3. ADF
4. FMS with RNP approvals
5. RNAV/RNP
6. Inertial
7. ACAS II with Rev. 7 software update
8. GPS (Satellite, TSO C 129 and SBAS TSO 145/146)
9. Portables

V. Publications

- A. Flight deck
 1. Enroute charts (VFR, IFR)
 2. Plotting charts
 3. Approach charts
 4. NAT track message (current)
 5. Flight management system (current and international)
 6. Electronic flight bag (current)
- B. Other
 1. Company flight operations manual (with SMS)
 2. Contact phone numbers and e-mail addresses

3. IFIM (applicable pages)
4. INOTAMs (current)
5. Manufacturer's maintenance manual
6. Jane's World Handling Agents Manual (for appropriate region)
7. IATA's Travel Information Manual (TIM)
8. FOQA documents (if required for commercial operations)

VI. Survival Equipment

- A. Area survival kit with documentation
- B. Medical kit with documentation
- C. Emergency locator transmitters (ELTs – 406MHz, if possible)
- D. Life preservers, rafts and provisions

VII. Facilitation Aids

- A. U.S. Department of State (embassies/consulates)
- B. U.S. CBP Service

- C. FAA Office of International Aviation
- D. FAA Office of Security
- E. Transportation Security Administration
- F. FAA International Representative

VIII. Other Considerations

- A. Professional planner
- B. Aircraft locks
- C. Spare keys
- D. Commissary supplies
- E. Ground transportation
- F. Hotel reservations
- G. Camera (use with discretion)
- H. Towbar
- I. Electrical plug adapters
- J. NBAA International Feedback Database reports

Figure 3.2: NBAA International Operators Committee Recommendations

I. Crew Qualifications for the Issuance of a MOPS LOA Can Be Satisfied by One of the Following:

- A. Operator's oceanic operations training program
- B. Commercial oceanic operations training program
- C. Military training records of prior oceanic operations
- D. Other methods (written testing, oral testing or evidence of prior experience)

II. Crew's Knowledge in the Following Subjects:

- A. ICAO operational rules and regulations
- B. ICAO measurement standards
- C. Use of oceanic flight plotting charts
- D. Sources and content of international flight publications
- E. Itinerary planning
- F. FAA and ICAO international flight plans and flight log preparation
- G. Route planning within special use airspace
- H. Unique enroute and terminal procedures (TERPS vs. Pans Ops)
- I. Long range air-to-ground communications (HF and SATCOM procedures)
- J. Structure of special use airspace
- K. Air traffic/oceanic clearance and position reporting
- L. International meteorology – North Atlantic use of VOLMET
- M. Navigation procedures for equipment required
- N. Emergency and contingency procedures (ETOPS)
- O. Regional Supplemental Procedures, ICAO Doc 7030

III. Pre-Flight Planning

- A. Verify aircraft has a current LOA approved for MNPS, RVSM and RNP operations per manufacturer's specifications and airspace to be used
- B. NBAA International Operations Checklist completed (see Figure 3.1)
- C. Minimum navigation equipment
- D. Minimum communication equipment

IV. Pre-Flight Procedures

- A. Review maintenance logs to ascertain condition of equipment.
- B. During walk around, attention should be paid to static sources and condition of fuselage skin around static sources.
- C. Before takeoff, altimeters set to local QNH and should display a known elevation. The two primary altimeters should agree within limits (75 ft. max.).
- D. Before takeoff, equipment required for flight in MNPS/RVSM airspace must be operational.
 - 1. Should any of the required equipment fail prior to entering MNPS/RVSM airspace, the pilots should request a new clearance so as to avoid flight in this airspace.

V. In-Flight Procedures

- A. Crews comply with aircraft operating restrictions related to MNPS, RNP and RVSM airworthiness approvals.
- B. Primary and secondary altimeters set at 29.92" of mercury (1013 hPa or mb) when passing transition altitude and rechecking for proper setting when reaching cleared flight level (CFL).
- C. Flight levels can begin at different altitudes in different airspace
- D. Essential that aircraft be flown at CFL.
- E. Aircraft is not allowed to overshoot or undershoot CFL by more than 150 feet.
- F. Altitude control system will be operative and engaged during level cruise.
- G. Altitude alert system must be operational.
- H. Cross check primary altimeters at one-hour intervals; 200 feet is maximum difference.
- I. Altimeter system used to control the aircraft should provide input to altitude reporting transponder.
- J. Pilot advised TVE (total vertical error) greater than 300 feet and/or ASE greater than 245 feet. The pilot should follow procedures to protect safe operation of the aircraft.
- K. Pilot notified by ATC of an ADD (assigned altitude deviation) error in excess of 300 feet, the pilot should take action to return to CFL as quickly as possible.
- L. Contingency procedures after entering MNPS/RVSM airspace with ability to maintain CFL.
 - 1. Pilot should notify ATC of:
 - a. Equipment failures
 - 1. Automatic altitude control
 - 2. Loss of redundancy of altimeter system
 - 3. Loss of engine necessitating descent
 - 4. Any other equipment affecting ability to maintain CFL
 - b. When encountering greater than moderate turbulence
 - 2. An ASRS report should be filed describing any failure or major discrepancy Revision

VI. Postflight

- A. Maintenance log book entries for height-keeping. Systems should detail the defect and crew action taken to isolate and rectify the fault.

VII. Special Emphasis Items: Flightcrew Training

- A. Knowledge and understanding of ATC phraseology specified for areas of operation.
 - 1. Definitions:
 - a. AAD – Assigned Altitude Deviation
 - b. ASE – Altimetry System Error
 - c. AVE – Avionics Error
 - d. CFL – Cleared Flight Level
 - e. LOA – Letter of Authorization
 - f. MNPS – Minimum Navigation Performance Specifications

- g. QFE –Height Above Airport
- h. QNH –Height Above Mean Sea Level
- i. RVSM – Reduced Vertical Separation Minimums
- j. SSEC – Static Source Error Correction
- k. TVE – Total Vertical Error
- B. Crews cross-checking of each other to ensure ATC clearances are correctly complied with.
 - 1. Waypoint insertion and verification:
 - a. Only one master document shall be used on the flight deck (can be a computer generated flight plan).
 - b. One crewmember will enter flight plan coordinates into FMS.
 - c. Second crewmember will recall the data and verify the inserted waypoints for accuracy and circle the waypoint on the master document.
 - d. When a reroute is necessary, the old waypoints should be crossed out, and new ones entered in their place on master document.
 - 2. Arrival at enroute reporting points:
 - a. Approaching the waypoint both CDUs will be cross-checked for waypoint name, coordinates, distance and magnetic course of the next waypoint and that these are in agreement with the flight plan.
 - b. Within 10 minutes after waypoint passage, press both CDUs' hold buttons, record lat /longs and plot on the position plotting chart to verify the proper track.
- C. Accuracy of standby altimeters in contingencies.
- D. Problems of visual perception of other aircraft at 1,000 feet separation during day and night conditions.
- E. Characteristics of altitude capture systems which may lead to over/under shoot.
- F. Relationships between the altimeter, automatic altitude control and transponder systems in normal and abnormal situations.
- G. Aircraft operating restrictions related to MNPS/ RNP/RVSM airworthiness approval.
- H. Dead reckoning procedures:
 - 1. Accurate plotting and measurement of intended flight path.
 - 2. Careful preflight computation and in-flight logging.
 - 3. Frequent and systematic reading, and averaging of information supplied by navigation instruments.
 - 4. Frequent determination and recording of the winds.
 - 5. Accurate computation of track, ground speed and distance run.
 - 6. Sensible logic in predicting the aircraft's course and speed beyond a checkpoint or DR position.

VIII. Basic Concepts for Contingencies

- A. Pilot in Command (PIC) responsibility:
 - 1. Final authority and responsibility for safe operation of the aircraft.

- B. ICAO Regional Supplemental Procedures, Doc 7030 (paragraph 6.0)
- C. Unsure of vertical or lateral position without ATC clearance.
 - 1. Maximum use of aircraft lighting.
 - 2. Broadcast position, flight level and intentions on 121.5 MHz (123.45 as backup).
- D. Advise ATC as soon as possible of contingency situation.
- E. If ATC clearance cannot be obtained in timely manner, aircraft flown at altitude and/or track where other aircraft are least likely to be encountered.
 - 1. Offset lateral distance between routes (30 nm or as appropriate)
 - 2. Offset half vertical distance between altitudes
 - 3. Diversion below FL 285 or if possible climb above FL 410
- F. When executing contingency maneuver, the pilot should:
 - 1. Watch for conflicting traffic
 - 2. Alert traffic on 123.45 MHz (121.5 as backup)
 - 3. Fly offset tracks or altitudes until ATC clearance is obtained
 - 4. Obtain ATC clearance as soon as possible
- G. Transition altitudes
 - 1. Verify clearances (FLs begin different altitudes)
 - 2. Confirm SIDs as appropriate

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4. MAINTENANCE OPERATIONS

4.1. Maintenance Operations Manual

Corporate aircraft maintenance involves a level of sophistication that requires a set of policies and procedures for basic administration and operation. NBAA recommends that business aviation departments establish a Maintenance Operations Manual to formalize and document policies and procedures in a single source.

Aviation department maintenance personnel should refer to this manual for operational guidance in order to provide the highest degree of safety combined with the most consistent level of support.

4.2. Purpose of the Business Aviation Maintenance Department

A major contributor to the success of the corporate flight department is the aircraft maintenance function. Within the flight department, the maintenance function works as an equal partner with management and flightcrew personnel for the success of an organization's flight operations. Maintenance personnel have the direct responsibility of maintaining proper aircraft condition and airworthiness and thereby help provide the proper asset management of the company aircraft. This asset management includes short- and long-term operational issues, aircraft improvements and maintenance issues that will affect operational capability and the aircraft's current and future value.

First and foremost, safety should be the primary focus for all maintenance activities in and around the aircraft, ramp and aviation department facilities. Maintenance guidelines can be found in many places, such as the manufacturer of components, which include airframe, powerplant, accessory, appliances and the applicable Federal Air Regulations (FARs).

Mutually understood practices for maintenance, repair, discrepancy documentation, corrective action, minimum equipment lists (MELs), regulations and internal company policies should be fully integrated into the Maintenance Operations Manual and faithfully performed by maintenance personnel. Likewise, good communication between maintenance technicians and other flight department members, such as dispatchers and flightcrew members, is imperative for smooth and stable aviation operations.

Topics in Section 4 of this *Management Guide* will attempt to provide specific information from the operator's perspective, providing examples of various processes that may assist in the formation or enhancement of a typical corporate aviation maintenance group or department.

4.3. Maintenance Department Mission Statement

The aviation department should have an overall mission statement that describes its role for the particular company served. A mission statement is a brief paragraph that provides a concise and relevant definition of a given activity that may be easily understood by a large audience. This audience may be potential users, customers and/or senior management. The mission statement should reflect the values and principles of the NBAA Member Company.

Example: The mission of XYZ Aviation Department is to provide safe and efficient air transportation service to employees and guests who work directly in assisting the company to meet its business objectives.

The maintenance function may wish to develop a statement of its own that supports the flight department's general mission statement.

4.4. Maintenance Department Budget

Typically, maintenance departments are required to have adequate monetary resources for the operating (fiscal) year. The parent company's budget policies and procedures should be clearly understood and complied with. Both short- and long-range planning should be developed for asset management that reflects day-to-day operations and capital expenditures, including training, replacement parts, additional support equipment, engine reserves, salaries and other applicable items. Good business practice dictates that the company's accounting and budgeting personnel be consulted on an ongoing basis to ensure that they clearly understand the maintenance department's needs and plan for them. The development of this relationship may prove to be critical to the approval of important maintenance-oriented programs and the continued success of the aviation department (for a Sample Maintenance Budget Form, along with related charts for Relative Monthly Expenses and Projected Monthly Downtime, see **Figures 4.1, 4.2 and 4.3**).

4.5. Maintenance Department Organization

The Administration section of this *NBAA Management Guide* provides useful information on the organization of a typical corporate aviation function. The aviation department personnel material in Section 1 covers the most common job titles found in an aviation-oriented activity.

Within Section 1 of this guide, **Figure 1.3** shows a sample organizational chart for large flight departments and **Figure 1.4** shows a sample organizational chart for smaller flight departments. When reviewing these diagrams, note that both maintenance and flight operations sit on the same reporting level regardless of size of the organization. This establishes a proper balance for the operational needs of both

areas and provides the opportunity to work together toward solutions of commonly shared duties and responsibilities without concern for which group has the highest rank.

4.6. Staffing the Maintenance Department

Section 1 of this *Management Guide* provides guidelines to assist in determining the appropriate number of staff members for a particular maintenance operation. The formula provided may be modified to meet the unique needs or demands of any given company.

Consultation with other corporate operators may provide important information when forecasting staffing requirements. This information may be most helpful when adding, replacing and upgrading a piece of equipment to the current fleet. Caution should be exercised when using manufacturer's data for any type of maintenance personnel planning, since this information often favors optimum situations rarely found in actual operating conditions.

4.7. Maintenance Technician Qualifications

Corporate aviation departments should require that their technicians hold an FAA Airframe and Powerplant license. Criteria for the licensing can be found in Subpart D of FAR Part 65.

One of the most important qualifications of the maintenance technician is the individual's ability to grasp the operation of an aircraft's system(s) and solve complex system and procedural problems. This experience is acquired over time by on-the-job experience and specialized training. Therefore, when considering a prospective candidate for a position within an aviation department, management should consider both the experience and training of that person.

Computer skills also are an increasingly valuable enhancement that will complement a technician's ability, since aircraft manufacturers now are providing equipment that can be fault analyzed with a laptop and appropriate software. In addition, aircraft often are delivered with maintenance manuals in CD-ROM format.

Other beneficial experience includes personal improvement courses, which add to an individual's ability to listen and communicate, and human factors training and resource management courses, which allow the individual to recognize and manage interpersonal issues. A flight department should provide this type of training for all staff members as part of a complete departmental development plan.

In certain circumstances, an apprenticeship program for individuals who do not yet possess an Airframe and Powerplant license may be applicable. Such a program provides

the opportunity to develop and mold a technician who demonstrates a high level of ability and a willingness to learn.

The Inspection Authorization (IA) certificate is an attachment to an individual's Airframe and Powerplant license. This endorsement can give the maintenance department added flexibility through increased signature authority level. (Reference FAR Part 65 for further details.)

4.8. Maintenance Technician Tools

Aircraft maintenance technicians should possess adequate tools to perform normal maintenance tasks. These tasks include the removal and replacement of standard aircraft fasteners such as screws, bolts, nuts and pins. Tools should be of a quality appropriate for the maintenance of aircraft and the prevention of personal injury and equipment damage.

The department may give consideration to a tool reimbursement program that will help to defray the high cost of tool purchases. This program could be developed in such a manner as to promote the purchase of high-quality tools that can improve the efficiency and quality of work.

4.9. Shop Tools and Support Equipment

Performing proper maintenance and ground support requires a flight department to invest in certain equipment. This equipment, along with staffing and facilities, will determine the overall capabilities of the maintenance function. The equipment should be of a quality and quantity that will provide safe operations and ease of application. Analysis conducted with the input of fellow operators and manufacturer field service representatives can help ensure that the selection of equipment is made wisely.

As a minimum, the department should invest in equipment that meets specifications to provide workplace safety and prevent long-term injuries or discomfort. Some equipment, such as precision torque wrenches and electrical measuring meters, is required to complete specific work tasks. Other equipment used to facilitate fault isolation is additional and enhances capabilities to expedite the aircraft's return to service. Examples of basic servicing equipment include jacking equipment, hydraulic service stands and compressed gases. Safety for both the maintenance personnel and the aircraft should factor heavily in the selection of such equipment.

It is required that all tools used to measure or test aircraft components or functions be properly calibrated.

4.9.1. CALIBRATION OF PRECISION TOOLS

A calibrated tools program should be used to track and record the calibration and disposition of all tools used for these purposes. The maintenance management function is responsible for ensuring the calibration of all precision tools, both company and employee-owned, including meters, gauges and torque wrenches, in accordance with the applicable specifications.

Date Prepared	Current	Times	Landings
Current	Aircraft		
#1 Engine			
#2 Engine			
#3 Engine			

Model	
Serial Number	
Calendar Year	
Budgeted Flight Hours	
Budgeted Aircraft Landings	

Figure 4.1: Sample Maintenance Budget Form

Scheduled Maintenance	January	February	March	April	May	June	July	August	September	October	November	December	Year
Coordinator Salary	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	\$72,000.00
Inspections, Airframe													
Fat Rate													\$0.00
Discrepancies													\$0.00
Publications/Subscriptions													\$10,500.00
Computer Tracking Program													
Engine Payment Program (MSP)	\$10,416.00	\$10,416.00	\$10,416.00	\$10,416.00	\$10,416.00	\$10,416.00	\$10,416.00	\$10,416.00	\$10,416.00	\$10,416.00	\$10,416.00	\$10,416.00	\$124,922.00
Hourly Rate (\$125 per engine)													
Engine Reserves	n/a												\$0.00
Airframe Payment Program	\$14,583.00	\$14,583.00	\$14,583.00	\$14,583.00	\$14,583.00	\$14,583.00	\$14,583.00	\$14,583.00	\$14,583.00	\$14,583.00	\$14,583.00	\$14,583.00	\$174,996.00
Hourly rates (\$350)													
Landing Gear Overhaul													\$0.00
Engine Overhaul/H.S.I.			\$600,000.00										\$0.00
Thrust Reverser Overhaul													\$600,000.00
APU Overhaul or MSP		\$15,000.00											\$0.00
Corrosion Inspections													\$15,000.00
Service Bulletins													\$0.00
Airworthiness Directives													\$0.00
Subtotal	\$24,999.00	\$44,499.00	\$633,499.00	\$24,999.00	\$30,999.00	\$24,999.00	\$24,999.00	\$24,999.00	\$24,999.00	\$24,999.00	\$24,999.00	\$24,999.00	\$997,488.00
Unscheduled Maintenance													
Brakes				\$50,000.00			\$50,000.00						\$100,000.00
Tires and wheels													\$0.00
Flight Discrepancies	\$8,000.00	\$8,000.00	\$8,000.00	\$8,000.00	\$8,000.00	\$8,000.00	\$8,000.00	\$8,000.00	\$8,000.00	\$8,000.00	\$8,000.00	\$8,000.00	\$96,000.00
Subtotal	\$8,000.00	\$8,000.00	\$8,000.00	\$58,000.00	\$8,000.00	\$8,000.00	\$58,000.00	\$8,000.00	\$8,000.00	\$8,000.00	\$8,000.00	\$8,000.00	\$196,000.00
Mods and Upgrades													
Spares													\$0.00
Paint				\$80,000.00									\$80,000.00
Interior				\$45,000.00									\$45,000.00
Entertainment Systems													\$0.00
Avionics													\$0.00
Others													\$0.00
Subtotal	\$0.00	\$0.00	\$0.00	\$125,000.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$45,000.00
Total	\$32,999.00	\$52,499.00	\$641,499.00	\$207,999.00	\$38,999.00	\$32,999.00	\$82,999.00	\$32,999.00	\$32,999.00	\$32,999.00	\$32,999.00	\$32,999.00	\$1,238,488.00
Estimated Down Time (in Days)	2			8	25			3			3		\$1,238,488.00

Figure 4.2: Relative Monthly Expenses

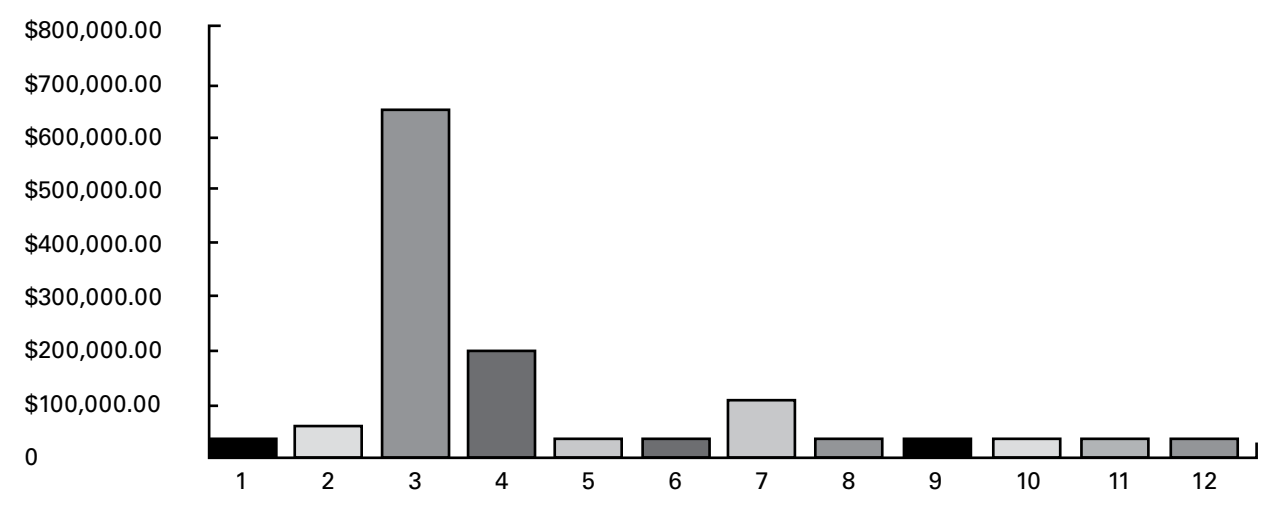
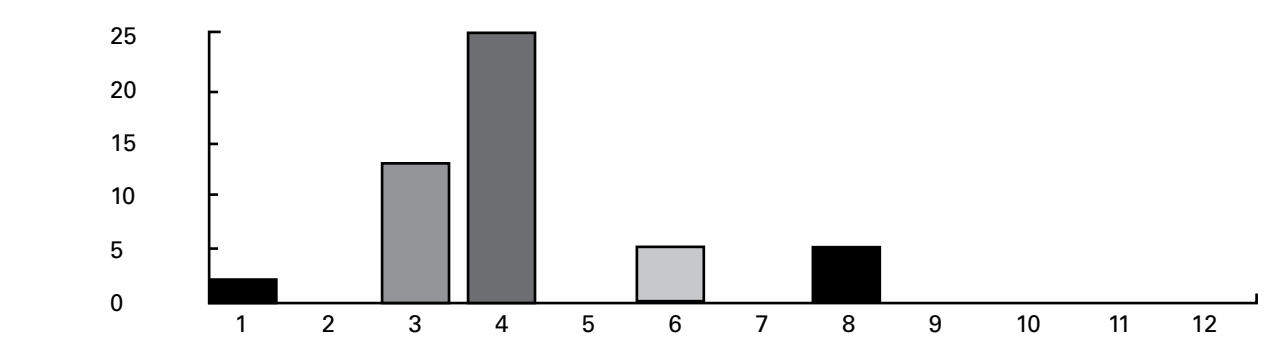


Figure 4.3: Projected Monthly Downtime



All precision tools covered by this section will be calibrated every 12 calendar months unless otherwise noted. All precision tools will be controlled by serial number or another number assigned to the tool for traceability and tracking.

The company performing the tool calibration will affix a sticker to each item calibrated identifying the date of calibration. If the sticker becomes lost or illegible and the tool is not yet due for recalibration, the director of maintenance may affix a new sticker using the information from his or her records.

The maintenance department may maintain a tool calibration log identifying the tools or equipment requiring calibration, the date of last calibration, the company performing the last calibration, the method of calibration and proof that the equipment used for calibration is traceable to the National Bureau of Standards.

Tool calibration information will be retained until the tool is recalibrated or no longer used by the company.

A computer program may be used to control tool calibration intervals. The program will be checked once each month to arrange a list of tools that will need calibration that month. Any calibrated tool, which has been dropped or damaged, will be recalibrated prior to further use.

4.10. Maintenance Technician Training

Training is an essential element of the maintenance function within a corporate flight department. Maintenance costs in any flight department can represent one of the most extensive and difficult expenses to predict and budget for, due to unforeseen failures or malfunctions. With even one inadvertent misdiagnosis of a malfunction, the resulting improper corrective action can unnecessarily compound these costs. More importantly, the secondary economic impact of a cancelled flight, in terms of missed corporate opportunity and diminished aviation department credibility, can eclipse the immediately measurable costs.

In order for maintenance personnel to be fully effective in supporting the mission of the company, they should be both technically proficient and knowledgeable of the company business. Development of a strong training program for maintenance personnel is one of the most effective means by which an aviation department can promote efficiency and cost effectiveness in its operations, while maintaining the expected high levels of safety. Initial, recurrent and other professional training should be structured to support the following:

- Safe and efficient aircraft operations
- Dispatch reliability/maintainability
- Troubleshooting/diagnostic accuracy and cost-effectiveness
- Operational control, planning and accounting
- Personnel management, leadership and teamwork
- Communications skills

Each operator should provide a training program for its maintenance personnel to ensure that the technician is familiar with and competent in the assigned duties of the position. The training program should consist of initial and recurrent courses in each type of aircraft operated and maintained by the company. The type-specific courses should focus on aircraft and systems familiarization, including diagnostic testing and line-troubleshooting techniques designed to promote efficient and cost-effective operations. This will enable the aviation department to salvage flights that might otherwise be cancelled due to a malfunction. Some existing training programs do not emphasize the line diagnostic and maintenance skills necessary for ensuring dispatch reliability and cost control. Aviation department managers should aggressively seek out training programs that support these critical functions.

Training facilities, simulators, aids and materials should provide an appropriate learning environment that meets the trainee's requirements. Training should not be treated as a one-time event in which all knowledge is expected to be imparted over a period of days or weeks. Rather, training should be structured to support the ongoing daily operations of the aviation department, incorporating reference resources, product support/troubleshooting information and training refresher materials. Examples of such references include online technical support systems, diagnostic aids, self-directed study materials and interactive training aids. Further, NBAA recommends that aircraft-specific recurrent training be conducted annually at a reputable training facility.

In addition to training for technical competency, aviation department managers should work to foster a team environment in which all personnel understand their role in the organization and their impact on the economic and operational efficiency of the department. Maintenance personnel training should include personnel management, leadership, teamwork and communication skills. The aviation department's budgetary process should be participatory in nature to ensure that all personnel recognize and accept their role in meeting the economic objectives and constraints of the department. To support this, maintenance personnel should receive training designed to develop budgetary planning and control skills.

To maximize utilization of all the department's resources, consideration should be given to providing training for shop equipment not specifically dedicated to a particular aircraft. This training may be gained on site or through vocational/

technical learning centers. Additionally, because of the nature of corporate flight activity, all tools within a shop may not receive daily use, so in order for a technician to remain proficient while continually developing a relevant set of skills, it may be beneficial to provide a program that encourages a limited number of personal shop projects. Approval should be given by both the maintenance management and department manager and must fall within established company guidelines.

The handling of hazardous materials that the maintenance technicians come in contact with in the performance of their duties raises many concerns. The development of a "Hazmat Training Program " should be considered to protect both the employee and the organization. Guidance in this area can be found through the Research and Special Programs Office of Hazardous Materials Safety at <http://hazmat.dot.gov>.

4.11. Maintenance Technician Work Performance Criteria

A technician's performance of assigned duties may be viewed from two perspectives: First, from that of the FAA, and second, from that of the company employing the individual.

FAR 43, Subpart 43.13 provides the technician with guidelines to follow when performing maintenance on aircraft. It should be mentioned that these guidelines, summarized below, are considered the minimum requirements.

- A person is required to follow methods, techniques and practices set forth by the aircraft or component manufacturer. These instructions or techniques should be acceptable to the administrator. The individual carrying out these practices should use the proper manufacturer's maintenance manuals or other instructions for continued airworthiness, tools and equipment as spelled out in the procedures, or the equivalent as acceptable to the administrator.
- Each individual maintaining, altering, or performing maintenance will do it in such a manner that the condition of the engine, aircraft or component thereof will be at the very minimum equal to the original or properly altered condition.
- Special provisions exist for individuals who operate under air carrier FAR 121, 125, 129 and 135. One of the requirements when operating under these rules is that when holding an air carrier certificate you must provide a program of continued airworthiness acceptable to the administrator.

A technician working in corporate aviation must be a multi-skilled individual. The development and measure of a maintenance person rely heavily on both interpersonal skills and technical proficiency. These two must work hand in hand in order for the individual to be effective and productive.

Criteria that may be helpful in measuring the performance of not only technicians but also aviation department employees as a whole include:

- Writing Skills
 - Writes clearly and informatively
 - Edits work for spelling and grammar
 - Varies style to meet the needs of the audience
- Team Participation
 - Balances team and individual responsibilities
 - Exhibits objectivity and openness to other views
 - Gives and welcomes feedback
 - Contributes to building a positive team spirit
- Quantity
 - Completes work in a timely manner
 - Achieves established goals
- Quality
 - Demonstrates accuracy and thoroughness
 - Displays a commitment to excellence
 - Looks for ways to improve and promote quality
 - Applies feedback to improve performance
 - Monitors own work to ensure quality
- Problem Solving
 - Identifies problems in a timely manner
 - Gathers and analyzes information skillfully
 - Develops alternative solutions
 - Resolves problems in early stages
 - Works well in group-problem-solving situations
- Planning and Organization
 - Prioritizes and plans work activities
 - Uses time efficiently
- Plans for additional resources
 - Integrates changes smoothly
 - Sets goals and objectives
- Organization Support
 - Follows policies and procedures
 - Completes administrative tasks correctly and on time
 - Supports the organization goals and values
 - Benefits the organization through outside activities
- Oral Communication
 - Speaks clearly and persuasively
 - Listens and obtains clarification
 - Responds well to questions
 - Demonstrates group presentation skills
 - Participates in meetings
- Judgment
 - Displays a willingness to make decisions
 - Exhibits sound and accurate judgment
 - Includes the appropriate people in the decision-making process
- Job Knowledge
 - Competent in the required job skills and knowledge
 - Exhibits ability to learn and apply new skills
 - Keeps abreast of current industry developments
 - Requires minimal supervision
 - Displays an understanding of how the individual's job relates to others' jobs
- Initiative
 - Volunteers readily
 - Undertakes self-development activities
- Dependability
 - Responds to requests for service and assistance
 - Follows instructions and responds to management direction
 - Takes responsibility for own actions
 - Commits to doing the best job possible
 - Meets attendance and punctuality guidelines
- Customer Service
 - Displays courtesy and sensitivity
 - Meets commitments
 - Responds to customer needs
 - Manages difficult or emotional customer situations
- Cooperation
 - Establishes and maintains effective relations
 - Displays positive outlook and pleasant manner
 - Offers assistance and support to co-workers
 - Works actively to resolve conflicts
 - Works cooperatively in group situations

- Communications
 - Expresses ideas and thoughts verbally
 - Expresses ideas and thoughts in written form
 - Exhibits good listening and comprehension
 - Selects and uses the appropriate communication methods
- Analytical Skills
 - Synthesizes complex and diverse information
 - Collects and utilizes data
 - Uses intuition and experience to compliment data
 - Identifies data relationships and dependencies

4.12. Elements of Aircraft Maintenance Activity

This section discusses preflight and postflight inspections and identifies various maintenance inspection options defined by regulations.

4.12.1. PREFLIGHT INSPECTIONS

When operating an aircraft under FAR Part 91, it is the responsibility of the pilot in command to determine the airworthiness of the aircraft before flight. FAR Part 135 and 121 also have specific regulations regarding preflight inspections and personnel performing the inspections.

Preflight inspection requirements and details must be obtained from the manufacturer of the aircraft for the specific type and model being operated. This information may be found in the Approved Flight Manual, Pilot's Operating Handbook or the Maintenance Manual. Additional inspection requirements (i.e., instructions for continued airworthiness) contained in a Supplemental Type Certificate alteration should be included in a preflight inspection checklist. Required "inspection items" must be completed as directed during the preflight inspection.

It is prudent to have a formalized preflight checklist that is completed before the first flight of each day and signed by that individual performing the inspection.

Due to maintenance requirements, the configuration of system controls and switches may differ from the flight configuration. Following any aircraft maintenance, the flightcrew should debrief with the maintenance personnel to understand the full scope of the maintenance performed. The flightcrew should perform a particularly detailed preflight verifying all switch positions and cockpit control configurations.

4.12.2. POSTFLIGHT INSPECTIONS

In the postflight inspection, the condition of the aircraft and its servicing requirements are evaluated. It is performed

before the subsequent scheduled flight and serves as an opportunity to ensure dispatch for the next scheduled flight.

A detailed inspection of the aircraft should be performed on the last flight of each day. The manufacturer's inspection criteria and servicing specifications are to be addressed during the postflight. Due to regulatory preventative maintenance limitations on flightcrew, aircraft maintenance technicians should carry out postflight inspections. A formalized checklist should be used that covers all required items along with a review and disposition of all maintenance discrepancies.

Cleaning of the aircraft cabin, windows and exterior should also take place at this time. If the aircraft is away from home base, the flightcrew must ensure airworthiness by having manufacturer-recommended servicing and inspection items complied with in conjunction with applicable FARs.

4.12.3. INSPECTION PROGRAMS

FAR Part 91 requires that an aircraft operated under this part have an established inspection program approved by the administrator (i.e., a manufacturer's program, an air carrier program, or a self-developed program that has been approved by the administrator). The selected program must be identified in the aircraft logs and notification made to the local FAA office of jurisdiction, Flight Standards District Office or equivalent.

Inspection programs have three basic types of schedules: annual, progressive and continuous.

4.12.3.1. Annual Inspection Schedule

In an annual inspection schedule, inspection of the complete aircraft must be made once every 12 calendar months. This inspection is performed in accordance with a specific checklist of inspection items, and the aircraft condition and airworthiness is determined and recorded in the aircraft log.

An annual inspection program is performed by a certified technician with an Inspection Authorization and must comply with Appendix D of FAR Part 43 or the appropriate guidelines established by the manufacturer of the aircraft. This type of inspection is designed for smaller aircraft. The aircraft manufacturer of small aircraft typically will identify this as their approved program.

The annual inspection schedule is one event from start to finish and cannot be interrupted for return to service until completed. An annual inspection requires the aircraft to be in maintenance for much longer than an aircraft under the progressive or continuous programs.

4.12.3.2. Progressive Inspection Schedule

In a progressive inspection schedule, inspection of the entire aircraft must be made once every 12 calendar months. However the inspection is divided into several events during the 12-month period. This inspection is performed

in accordance with a specific checklist of inspection items, and the aircraft condition and airworthiness is determined for those items inspected at that time. The completion of inspection items is recorded in the aircraft log.

FAR Section 91.409 (d) outlines what is needed to set up a progressive inspection program. In order to comply, the registered owner must submit a written request to the FAA FSDO having jurisdiction over the area in which the applicant is located. Further, the owner must provide a certified technician holding an Inspection Authorization, a certified repair station, or the manufacturer of the aircraft to perform the inspection. Included in paragraph (d) are other requirements necessary to meet progressive inspection criteria.

4.12.3.3. Continuous Inspection Schedule

In a continuous inspection schedule, inspection of the entire aircraft takes place over the design life of the aircraft as identified to the FAA during certification. Specific items are inspected or maintained based on hours of utilization, calendar, number of landings or cycles. Many variations in the combination of criteria are found for larger corporate type aircraft.

FAR 91.409 (e) and (f) provide the basis for establishing a continuous inspection program for large airplanes, turbojet multiengine airplanes, turboprop multiengine airplanes and turbine powered rotorcraft. Note that options 3 and 4 of paragraph (f) are most relevant to the corporate operator. Under this program, it is not necessary for a certified technician to hold an Inspection Authorization for compliance.

Continuous inspection schedules are designed to ensure safe, adequate and timely maintenance that meets both FAA and the aircraft manufacturer's specifications. Under this schedule, the inspection and servicing are made in scheduled and incremental stages so that the aircraft is continuously inspected and constant airworthiness is maintained.

4.12.4. SELECTING AN INSPECTION SCHEDULE

It is most common to select an inspection program and schedule that have been developed and approved during aircraft certification by the manufacturer. Selecting the manufacturer program will ensure compliance for FAA, aircraft insurance issues and warranty issues.

Maintenance management should evaluate all of the programs and schedules, choosing the best for the company's operation. Deviations from the program or the schedule are possible but must be approved by the administrator in all cases. Before any final decisions are made it is very important that all applicable FARs are read and clearly understood. If necessary, this should include consultation with the local FSDO to ensure that all regulations are being followed. NBAA has obtained an exemption from FAR 91.409 for its Members that allow those who operate small aircraft or helicopters to use one of the inspection programs specified in FAR Section 91.409 (e), providing an approved

program is available. The person tasked with the selection and tracking of the maintenance and inspection program should be aware of the difference in philosophies associated with development of these programs, such as MSG 2 versus MSG 3, as well as the fact that certain aircraft can be operated under either program. Also the benefits and risks associated with Engine "On Condition" programs that are available.

4.12.5. ADDITIONAL INSPECTION REQUIREMENTS

Aircraft Manufacturer Inspection Programs do not encompass all regulatory items, which may affect the airworthiness of the aircraft. Each national aviation regulatory authority may have specific regulations, which must be reviewed and added to the inspection program as needed to ensure compliance. The FAR Part 39 Airworthiness Directive is one such area for FAA-registered aircraft.

4.12.5.1. Airworthiness Directives

Airworthiness Directives (ADs) are FAA regulations that require inspection and/or modification to an aircraft after it has been certified. Their intent is to ensure safe aircraft operation by identifying areas in an aircraft that need to be inspected or modified and/or have become unsafe during experience with the product. A continuous review of all AD notes must be made at each inspection event.

4.12.5.2. Flight Operations Inspections

There are specific inspections for types of equipment installed based on the airspace environment in which the aircraft will be operated (i.e., RVSM, IFR, RNP10, etc.). A complete review of the applicable FAR must be made to identify these additional requirements.

4.12.5.3. Type Certificate Data Sheet and Life Limited Components

Although not considered inspection items, some components have very specific "life limits," at which time they must be discarded. These items are a result of engineering system safety analysis during certification. They typically are identified on the aircraft TC or in the ATA Chapter 5 "Time and Life Limit" or "Airworthiness Limitations" sections of maintenance manuals. These must be managed in conjunction with the inspection program and schedule.

4.12.5.4. Inspection Items as a Result of Aircraft Modification

A review of all Supplemental Type Certificates and Form 337s that pertain to the aircraft must be completed to identify additional inspection items necessary for continued airworthiness. When an airframe, powerplant, or appliance is modified or repaired it must be evaluated for continuous airworthiness. This evaluation may result in a requirement to inspect or service an area at a specific interval to continue airworthiness.

4.12.5.5. Other Regulatory Agency Inspection

Consideration must be given to other governing agencies and their requirements, such as the Department of

Transportation and its jurisdiction over pressure cylinders (i.e., oxygen bottles and fire bottles). Any identified requirements must be added to the inspection program to ensure compliance and safe operation.

4.12.6. MANAGEMENT OF THE INSPECTION PROGRAM AND SCHEDULE

The management of the inspection items and status of aircraft airworthiness must be designated to a specific individual or managing agency. The ability to determine an aircraft's airworthiness is critical to the safe operation of the aircraft. Both independent vendors and the original equipment manufacturer (OEM) have developed computerized programs that can be very effective tools for the management of inspections. Regardless of the methodology selected, a consistent method should be employed.

4.12.7. ENGINE/COMPONENT INSPECTIONS AND OVERHAUL

An aircraft may have components and engines installed that require their own specific maintenance schedule or inspection as defined by their manufacturer. These components and engines may not be clearly identified in the aircraft manufacturer's maintenance and inspection manuals, and these items may even have optional programs for the operator to select. The typical option is for either an "on-condition" or "hard time" program.

"On-condition," indicates a methodology that might require more frequent inspection or servicing for the evaluation of the current condition against set standards or until failure is predicted or occurs.

"Hard time" indicates a methodology that allows the component to operate to a set utilization point (whether hours, landings, or cycles) with less maintenance/servicing until the component is removed for overhaul or replaced.

The owner/operator must evaluate the cost of fixed overhaul against the unpredictability of component replacement and the impact of each upon the organization.

4.12.8. SCHEDULED MAINTENANCE

Scheduled maintenance of the aircraft may consist of the following actions:

- Performing the required inspections items
- Servicing systems
- Correcting discrepancies
- Modifying the aircraft per Service Bulletins, STCs, etc.
- Painting and providing cosmetic repairs

This type of maintenance is planned with respect to the amount of time available, the tools/equipment needed, technical personnel and cost. A complete evaluation of the scope of the work should be completed to select the appropriately rated and capable agency/facility to perform

the work commensurate with the expectations of your organization. If an outside agency/facility is selected, an audit should be completed before taking the aircraft there for maintenance.

4.12.9. UNSCHEDULED MAINTENANCE

Unscheduled maintenance is that which occurs randomly from aircraft utilization and the effects of the operating environment. It typically results from causes such as system failures, accelerated wear, lightning strikes, hail storms, hard landings and wind shear. An appropriately rated technician using definitions, guidelines and criteria from the manufacturer, the FAA, or the designated airworthiness engineer typically determines corrective action and airworthiness. Maintenance management must have oversight of all unscheduled maintenance to ensure the appropriate level of corrective action.

The use of a maintenance authorization form, such as the one that appears in **Figure 4.4**, is good way to avoid using unauthorized individuals or agencies during a nonscheduled maintenance event while away from home base. This form will guide the maintenance manager and provide a standard to follow during what is normally a high-pressure event. The form guides the individual to obtain all the proper documentation and authorizations.

The maintenance authorization form should be tailored for each individual operation.

4.12.10. PERFORMANCE OF AIRCRAFT MAINTENANCE AND INSPECTIONS

The performance of all maintenance and inspections must be completed by those appropriately rated and trained to do so under the presiding regulatory authority or rules. United States-registered aircraft may have maintenance and inspections performed by appropriately trained and certified Airframe and Powerplant technicians, FAR-approved and appropriately rated Part 145 repair stations, and FAA-approved and appropriately rated foreign JAR 145 Repair Stations.

4.12.11. AIRDATA/RADIO/RADAR ELECTRONIC EQUIPMENT MAINTENANCE AND INSPECTION

The majority of Airframe and Powerplant maintenance technicians are not certified to perform or supervise maintenance and inspection of radar, radio equipment, autopilots and similar avionics. Unless a competent electronics technician is employed full time, companies should arrange to have this type of equipment maintained and inspected by a repair station with the appropriate ratings under FAR Part 145. If a company has its own avionics repair capabilities with properly trained technicians, it would be a certified repair station with all applicable ratings for the equipment designated.

Figure 4.4: Sample Contract Maintenance Authorization Form

Date _____

Registration number _____ Aircraft manufacturer _____

Aircraft model _____ Aircraft serial number _____

Nature of the maintenance to be performed _____

Is this aircraft currently listed under Part 135 operations specifications? Yes / No (circle one)

If not, the rest of this section is not applicable.

Make copy of the drug and alcohol program that covers the person performing maintenance, if applicable _____

Does the maintenance require RII authorization? Yes / No (circle one)

If yes, complete and check the following forms, if they are not currently on file:

RII authorization _____ RII list _____

Make sure the person signing has authorization and is on the list _____

Does the maintenance require airworthiness release? Yes / No (circle one)

Airworthiness release authorization _____ Airworthiness release list _____

Make sure the person signing has authorization and is on the list _____

For Repair Stations

Get a copy of the Repair Station Certificate _____

Make sure the Repair Station has the proper authorizations to perform the maintenance needed for this event

For Individuals Performing Maintenance

Name _____

What type of training does the individual possess for this task? _____

Does the individual possess the proper tools to perform the task? _____

Does the individual possess the current manuals required? _____

Get copy of A&P License _____

Is a part replacement required? Yes / No (circle one)

If yes, instruct the person receiving the part on how to perform an Incoming Parts Inspection.

Make copies of all parts tags, including incoming parts inspection tags _____

Make copies of individual's training certificates or authorizations _____

Forward copies of all forms to the chief inspector _____

Name of Person Authorizing Maintenance _____

4.12.12. OPERATIONAL CHECK FLIGHTS

Both FAR Section 91.407 and good operating practice require that an aircraft be flown before carrying passengers if it has been repaired or altered in a manner that may have changed its flight characteristics or substantially affected its operation in flight. If the check flight is a requirement of returning the aircraft to service, then the pilot conducting the check flight must sign the aircraft record indicating that the flight was accomplished. It is important before performing a check flight, that a written Flight Check Profile be developed and discussed with the crew flying the aircraft. This will help ensure that the crew is prepared for any procedures that will need to be performed during the flight and avoid any confusion. It is a good safety practice to conduct these flights during daylight VFR conditions only.

If a ground test can show conclusively that the repair or alteration has not changed the flight characteristics or substantially affected the flight operation of the aircraft, then an operational check flight is not required.

4.12.13. SCHEDULING INSPECTIONS, MAINTENANCE AND TIME-LIMITED COMPONENTS

Crucial to any flight department's success is a highly consistent and reliable dispatch rate. When an operator fails in this regard, the value of service provided erodes to a questionable level. Scheduling maintenance can have a real-time effect on how well a consistent and reliable dispatch rate is achieved. Maintenance activity should be planned to coincide as smoothly as possible with the flight schedule; coordination with flight operations is a must. The forecasted demand for both flight and maintenance needs to be clearly communicated across department functions so that all needs are understood and can be planned for whenever possible. This is an ongoing assignment that remains constant over the life of the department.

4.12.14. WORK INTERRUPTION PROCEDURES

Implementation of Work Interruption Procedures are very helpful for technicians to follow any time they leave the area of a job that is not complete. These procedures could be as simple as recording the incomplete item in the Flight Log to preclude a pilot from taking the aircraft with incomplete work in progress. These procedures should be tailored to the individual operation to ensure that they are effective.

4.12.15. PARTS REMOVAL FORM

A Parts Removal Form is a very effective tool, especially during an inspection, to verify that all the components removed during the inspection, have been reinstalled in the correct position.

Entry columns in the Parts Removal Book will generally include, Component Description, Part Number Off, Serial Number Off, Reason for removal, Part Number On, Serial Number On, and the initials of the installer.

4.13. Quality Assurance

The purpose of a quality assurance program is to verify on a continuing basis that the maintenance policies and procedures in use are current and effective, and that the aircraft is consistently returned to service in an airworthy condition. The quality assurance program specifically focuses on maintenance procedures, but it also should coordinate with the organization's safety management system (SMS).

4.13.1. REQUIREMENTS

A specific quality assurance program is not required of Part 91 operators, but it should be considered an industry standard or best practice.

Specific requirements for the quality assurance program for Part 135 and Part 121 operators can be found in FAR 135.431 and FAR 121.373, which both refer to a continuing analysis and surveillance system (CASS), described further in a later section of this guide. See also FAA Advisory Circular 120-79, Developing and Implementing a Continuing Analysis and Surveillance System.

On an international basis, the fundamental requirement for a quality assurance program is derived from ICAO Annex 6: 8.7.3.2, which states: "The maintenance organization shall ensure compliance with 8.7.3.1 by either establishing an independent quality assurance system to monitor compliance with and adequacy of the procedures, or by providing a system of inspection to ensure that all maintenance is properly performed." Individual countries develop their own specific regulations to ensure compliance with this rule.

4.13.2 OVERVIEW

The ICAO definition provides two options in developing a quality assurance program:

- A system of 100-percent inspection of all work performed – typically found in smaller organizations where an inspector or another technician inspects the work of the technician performing the task and signs the task card as the inspector.
- For larger organizations, an internal audit system that continuously reviews the policies and procedures in place to ensure their effectiveness is most commonly used. (This method is also known as the CASS.)

From a safety perspective, having both elements in place would provide the greatest margin of safety for maintenance operations. Regardless of the method selected, a clearly documented procedure for quality assurance is essential for consistent results.

4.13.3 100-PERCENT INSPECTIONS

In the U.S., duplicate inspections are required for items identified as required inspection items (RII) by the aircraft manufacturer. These typically include replacement of engines and controls, flight controls, key hydraulic system

elements and other items that could seriously impact the safety of flight. Individual organizations also can add items to the list of duplicate inspection items based on their own service history.

Most manufacturers provide task forms with a space for an inspector's signature for schedule maintenance tasks. While only required if specified in the approved inspection program, it is certainly a best practice that should be considered in the development of maintenance procedures.

One key to an effective duplicate inspection program begins with the organizational structure. Typically, a chief inspector reports to the maintenance manager on an equal level with the chief mechanic or whatever job title is responsible for production and scheduling of tasks. This structure is adopted to ensure that pressures to return the aircraft to service do not compromise the integrity of the work performed.

The other key to a successful 100-percent duplicate inspection process is the return-to-service procedures. These procedures should be documented and ensure that all forms used for scheduled and unscheduled maintenance have areas for the duplicate inspection signature. Furthermore, the process should ensure that all work performed by the various disciplines (avionics, interior, NDT, airframe, etc.) contains the inspector's release for that area and that one signature releases the entire aircraft for service.

4.13.4 CASS OVERVIEW

The continuous analysis and surveillance system (CASS) is essentially an internal auditing program for the maintenance department. These internal reviews usually divide all maintenance activities into various sections and are conducted on a scheduled basis. Generally, monthly inspections are conducted so that the entire organization is reviewed on an annual basis – much like the continuous inspection program for the aircraft.

The first critical success factor is the selection of the auditor(s). The internal audits may be conducted by an individual or by teams. In either case, it is essential that the person(s) conducting the reviews be well versed in both company procedures and regulatory requirements. It also is helpful to have training in auditing techniques. Many organizations have included auditor training into their training programs.

As with the 100-percent inspections, the organizational structure of CASS is another critical success factor. The person selected as the internal auditor needs to report directly to the maintenance manager for all matters relating to the internal audits to ensure that the proper resources are made available for the appropriate corrective actions. Furthermore, the internal auditor should work with the safety manager, if in place, to ensure continuity with the safety management system.

4.13.5 CASS AUDIT PROGRAM

As mentioned above, the internal audit program first needs to be well documented. The specific checklists used will evolve continuously as regulations and conditions change, but the frequency and procedures will remain relatively constant. The specific areas to be reviewed will vary considerably from one organization to another based on the nature of tasks performed, but listed below is a brief outline of areas typically reviewed:

Maintenance Authorization – Verify that the work performed is within the scope of approvals, typically the maintenance manual and inspection program. Also, verify that any work subcontracted is performed by organizations with appropriate certifications (auditing of vendors).

Maintenance Control – Verify that inspections are performed per the approved inspection program; life-limited parts are maintained per Chapter 5; all airworthiness directives and mandatory service bulletins are accomplished and other service information is properly reviewed; and all equipment is installed as alterations are maintained in accordance with instructions for continued airworthiness. Another area of maintenance control to be reviewed is that of scheduling, duty limits and other administrative policies for presence of procedures and consistency of application.

Quality Assurance – Review the effectiveness of the internal audit program to ensure that procedures are used consistently; the procedures in place reflect current requirements; and non-conformities are promptly corrected.

Maintenance Records – Ensure that appropriate entries are made and the aircraft is properly released; required supporting documentation is retained (and ideally the superseded documents are removed); listings are maintained per airworthiness directives and service bulletins; and all records are maintained and retained in accordance with company policies.

Training – Review the training program to ensure that all elements are addressed (technical training, industrial safety, company maintenance procedures, specialized training such as NDT, welding, etc.); the training is accomplished according to the schedule in the training plan; and appropriate records are maintained.

Publications – Verify that the appropriate publications are available for all tasks performed, and there is an effective process in place to ensure that only the most current technical and regulatory information is provided.

Equipment – Verify that all tooling and equipment necessary to properly perform the maintenance tasks are available and in good working order; an effective tool calibration program that includes personal tools is in place; and effective controls are used and record maintained.

Spares – Verify that the procedures in place ensure that an incoming inspection is performed; appropriate documenta-

tion is retained at acceptance of the materials; the materials are properly stored; a shelf life program is in place; appropriate tagging procedures are used; and unserviceable materials are adequately quarantined. In addition, this review should be applied not only to components but also to all materials such as sheet metal, consumables, standard parts and so on; aircraft materials should be effectively isolated from non-aircraft materials. Finally, there should be a process in place to qualify suppliers to ensure that only quality materials are procured.

Facility – Ensure that adequate facilities and conditions such as lighting, heating, etc. are in place and consistent with human factors affecting performance. Also, review the issues relating to industrial safety, environmental protection, fire prevention and aircraft fueling.

The above list is only intended as a starting point for developing an effective internal audit program. The primary resource will be the procedures found in the company maintenance procedures manual (sometimes referred to as the maintenance exposition). This document is the repository for company policies and procedures. The purpose of the internal audit program is to ensure that the procedures are current, complete and complied with.

4.13.6 CASS AUDIT RESULTS

The final critical element of the CASS system is the disposition of the information obtained during the internal audits. A system needs to be in place to promptly correct any non-conformity discovered during the reviews as well as any items received from anonymous hazard-reporting mechanisms that may be in place.

The first step is to develop a single list of the non-conformities. Just as with discrepancies found on the aircraft, it is critical to ensure that all items are properly corrected within the appropriate timeframe.

The next step is the analysis of the items. Frequently, a safety team is developed to help review the non-conformities and suggest or approve the corrective actions. Regardless of whether a team is used, it is important to have a review mechanism in place. Use of risk analysis or job hazard analysis tools is common for larger organizations, but less formal processes also can be effective.

Frequently, a hierarchy of corrective actions is developed. For a given hazard (a hole in the ground), the first choice would be engineering a permanent solution (fill the hole). The second preference would be to install adequate safeguards (put a rope around the hole), while the third choice might be training of employees (telling everyone to avoid the hole).

Once an appropriate corrective action has been determined and implemented, a follow-up should be conducted to verify that the non-conformity has been corrected. The final step is to communicate the results of the actions to the

workgroup both to validate the effectiveness of the program and to encourage participation by all.

4.14. Aircraft Maintenance Records Management

The need to keep and manage aircraft records is necessary for three distinct purposes:

- FAA regulations require that certain records be maintained.
- During an evaluation of the aircraft, records will validate the current status of the aircraft and reflect its current financial value.
- During maintenance, records will provide for more efficient troubleshooting and corrective action, thus reducing cost.

4.14.1. OVERVIEW OF THE FAA RECORDS REGULATION

The FAA's requirements for tracking the maintenance status of an aircraft and the associated recordkeeping responsibilities are described within FAR Sections 43.9, 43.11, 91.411, 91.413, 91.417, 91.419 and 91.421. Though these Parts overlap somewhat in regard to the basic information required for individuals performing the work, it is beneficial for each Part to be discussed individually to understand what is specifically needed of the corporate operator.

4.14.1.1. FAR Part 43.9 – Maintenance Records

This section covers the content, form and disposition of maintenance, preventive maintenance, rebuilding and alteration records. Each person performing this type of work will make an entry in the maintenance record of the aircraft, airframe, engine, propeller, appliance, or component as applicable that contains the following information:

- A description of the work performed. The date of completion of the work performed.
- The name of the person performing the work if other than the person below.
- If the work performed was satisfactorily, the signature, certificate number and kind of certificate held by the person approving the work. This signature constitutes the approval for return to service only for the work performed. In addition to the entry required under this Part, major repairs and major alterations will be entered on Form 337 in the manner described in Appendix B of FAR Part 43.

4.14.1.2. FAR Part 43.11 – Inspection Records

This Part is designed to address the content, form and disposition of records for any inspection performed under Part 91. Included is the format for approval and disapproval for return to service of aircraft and/or other components making up the aircraft under progressive or other types of inspection programs.

If as a result of discrepancies found during the inspection the aircraft is not returned to service, a list of discrepancies along with the inspection date is to be provided to the aircraft owner or operator.

As with FAR 43.9, certain information about the person performing the work is required:

- The type of inspection and a brief description of the extent of the inspection.
- The date of the inspection and aircraft total time in service.
- The signature, certificate number and type of certificate held by the person approving or disapproving for return to service the aircraft, airframe, engine, propeller, appliance, component part or portions thereof.
- Approval verbiage for return of the aircraft to service for any inspection other than a progressive program.
- Disapproval verbiage for aircraft that do not meet needed maintenance criteria, or is not in compliance with applicable specifications, airworthiness directives or other approved data for any inspection other than a progressive program.
- Progressive inspection verbiage for approval/disapproval for return to service.
- Identification of the inspection program, the part of the program accomplished and a statement that the inspection was performed in accordance with the requirements and procedures of that particular program.

FAR 43-11 has significant importance for the corporate operator. Its final paragraph provides the method for placarding inoperative items per FAR 91.213 that will allow continued operation under an approved MEL for the particular aircraft inspected.

4.14.1.3. FAR Part 91.411 – Altimeter System/Altitude Reporting Equipment Test and Inspections

This Part specifies altimeter system and altitude reporting equipment tests and inspections for those aircraft operating in controlled airspace under instrument flight rules. What are described are when and under what circumstances these tests and inspections must be performed and who may perform the work. Further reference and procedures for certification may be found in FAR Part 43 Appendices E and F. An aircraft record entry is required for this maintenance action.

4.14.1.4. FAR Part 91.413 – ATC Transponder Tests and Inspections

This Part provides the test and inspection guidelines for ATC transponder systems. As with 91.411, compliance procedures are outlined along with reference to FAR 43 Appendices E and F. An aircraft record entry is also required for this work.

Both 91.411 and 91.413 must be performed within the last 24 months and often are performed concurrently. Reduced Vertical Separation Minima (RVSM) certification can vary inspection frequency.

4.14.1.5. FAR 91.417 – Maintenance Records

This regulation is divided into two parts covering (a) the type of maintenance necessary to be kept on file and (b) how long this documentation must be retained. Defined calendar inspection dates and procedures within FAR 91.411 and 91.413 allow them to be exceptions to this rule. Records to be kept fall into these categories: maintenance, preventive maintenance, and alteration and records of the annual, progressive and required or other approved inspections for each aircraft, airframe, engine, propeller, rotor and appliance. These records must include:

- A description (or reference to data acceptable to the administrator) of the work performed.
- The date of completion of the work performed.
- The signature and certificate number of the person approving the aircraft for return to service.

Records contain the following information:

- The total time in service of the airframe, engine(s), propeller(s) and rotor(s).
- The current status of life-limited parts of each airframe, engine, propeller, rotor and appliance.
- The time since last overhaul of all items installed on the aircraft that are required to be overhauled on a specified time basis.
- The current inspection status of the aircraft, including the time since the last inspection required by the inspection program under which the aircraft and its appliances are maintained.
- The current status of applicable Airworthiness Directives, including for each item the method of compliance, the AD number and the revision date. If the AD involves recurring action, include the time and date when the next action is required.
- Copies of the forms prescribed in FAR 43.9 (FAA Form 337) for each major alteration to the airframe and currently installed engine(s), rotor(s), propeller(s) and appliances.

The owner or operator must retain the following records for the periods prescribed:

- The records specified in paragraph (a) (1) of this section shall be retained until the work is repeated or superseded by other work or for one year after the work is performed.
- The records specified in (a) (2) of this section shall be retained and transferred with the aircraft at the time it is sold.

- A list of defects furnished to a registered owner or operator under FAR 43.11 shall be retained until the defects are repaired and the aircraft is approved for return to service.

The owner or operator must make all maintenance records required to be kept by this section available for inspection by the administrator or any authorized representative of the National Transportation Safety Board (NTSB). In addition, when a fuel tank is installed in the passenger or baggage compartment per Part 43, a copy of the FAA Form 337 must be kept onboard the modified aircraft by the owner or operator for inspection upon request of any law enforcement officer.

4.14.1.6. FAR 91.419 – Transfer of Maintenance Records

Any owner or operator who sells a U.S.-registered aircraft must transfer to the purchaser at the time of sale the following records for that aircraft:

- The records specified in FAR 91.417(a) (2).
- The records specified in FAR 91.417 (a) (1) that are not included in (a) above except that the purchaser may permit the seller to keep physical custody of such records. However, custody of records by the seller does not relieve the purchaser of the responsibility under FAR 91.417(c) to make the records available for inspection by the administrator or any authorized representative of the NTSB.

4.14.1.7. FAR 91.421 – Rebuilt Engine Maintenance Records

The owner or operator may use a new maintenance record, without previous operating history, for an aircraft engine rebuilt by the manufacturer or an authorized agency approved by the manufacturer.

Each manufacturer or agency that grants zero time to an engine rebuilt by it must enter in the new record:

- A signed statement of the date the engine was rebuilt.
- Each change made as required by airworthiness directives.
- Each change made in compliance with manufacturer's service bulletins, if the entry specifically is requested in that bulletin.

For the purposes of this section, a rebuilt engine is a used engine that has been completely disassembled, inspected, repaired as necessary, reassembled, tested and approved in the same manner and to the same tolerances and limits as a new engine with either new or used parts. However, all parts used in it must conform to the production drawing tolerances and limits of new parts or be of approved oversized or under-sized dimensions for a new engine.

Federal Aviation Regulations, including those outlined above, may be subject to various degrees of interpretation by both the owner or operator and the FAA. It is critical that these and any other applicable rules and regulations be read thoroughly and clearly understood. Questions regarding their implementation and use should be directed to your local FSDO.

4.14.2. RECORDS MANAGEMENT FOR EVALUATION OF AIRCRAFT

FAA records requirements, like all FARs, are the minimum requirements to maintain airworthiness and legal regulatory conformity. Maintenance management attention also must be given toward management of the asset financial value and warranty issues. During an evaluation of the aircraft, records will validate the current status of the aircraft and reflect its current financial value. In consideration of this requirement, the following records should be retained in an organization:

- Copies of all vendor work orders
- Copies of all vendor invoices for inspections, modifications, STCs, refurbishments, etc.
- Copies of only the current component FAA 8130 Form or equivalent installed on the aircraft
- A record of all Service Bulletins and Service Letters complied with
- A record of all discrepancies corrected on the aircraft

4.14.3. RECORDS MANAGEMENT FOR MAINTENANCE

FAA records requirements do not take into consideration the ease of doing maintenance to improve efficiency. During maintenance, the technician's knowledge of the current configuration and previous configuration of an aircraft or its systems will provide for more efficient troubleshooting and corrective action and thus will reduce cost. Therefore, the following records also should be retained in an organization:

- Copies of all engineering drawings
- Copies of all modification instruction associated with their incorporation
- Photographs made during modifications
- Installation manuals used for modifications
- Copies of all wiring diagrams

4.14.4. RECORDS ORGANIZATION

Considering the requirements to hold aircraft records over a period of time and access them, a systematic approach should be applied to store the necessary records. This system should isolate or identify the following areas as files either in an electronic or hardcopy (paper) format:

- Current aircraft and engine hours/landings/cycles
- Current summary of Airworthiness Directive status
- Current status of all inspection programs
- List of all Service Bulletins, STCs, or modifications completed
- ATA structured file that holds current component information
- Vendor work orders

- Log books relative to each aircraft
- Copy of the current Weight and Balance Manual
- Copy of the current Equipment List
- Current summary of all FAA Form 337s
- Copy of Maintenance Task or Work Cards completed
- All relevant FAR 25 Burn Certification Documentation
- A summary of any "Instructions for Continued Airworthiness"

One system of organizing these records for easy auditing is the compilation of a Conformity Book. Copies of all the current above-mentioned relevant records are kept in a standard format by chapter. This becomes very effective in situations where there are different aircraft types managed by the same maintenance department.

NBAA does not recommend nor does the FAA require that maintenance logbooks or records be carried aboard an aircraft. In the event of an accident, these records could be destroyed, thus eliminating critical and relevant information about the aircraft.

4.15. Discrepancy Management

The sophistication and complexity of aircraft used in the corporate environment matches that of any other part of the aviation spectrum. Because of this, the expertise and strong teamwork skills of both maintenance department and flight operations personnel are essential for effective resolution of aircraft /system difficulties. Without a structured process of discrepancy management, several concerns become apparent:

- Communication between pilots and technicians regarding problems with an aircraft are passed verbally or not documented at all.
- When discrepancies are documented, the content and presentation of data varies greatly from flightcrew to flightcrew.
- Unclear squawks can lead to replacement parts that are incorrectly ordered.
- Write-ups are unnecessarily repeated.
- Application and interpretation of the MEL varies among pilots, technicians and the FAA.
- Intermittent discrepancies and ensuing troubleshooting lack documentation and follow-up.

4.15.1. BRIEFINGS AND DEBRIEFINGS

Briefings and debriefings are used in an effort to meet the aviation and maintenance departments' mission statements regarding safety, cost effectiveness, professionalism, quality and pride in work and a high level of internal and external customer satisfaction.

A formal briefing and debriefing process is recommended. Working groups as well as individuals benefit from discussing ideas, developing action plans, identifying ownership and acquiring backup. The maintenance/flightcrew brief and debrief process is the mechanism used to bridge communication gaps regarding discrepancies or issues that concern either maintenance or flight working groups.

In a briefing session, individuals who were actively involved in performing maintenance on the aircraft or any of its sub-systems should meet with the flightcrew to inform them of the maintenance action performed. This can be either corrective action for a discrepancy or routine maintenance inspections.

In a debriefing session, maintenance technicians and flightcrew members meet to acquire relevant information regarding discrepancies. Once the information is gathered, the individual leaves the debrief meeting with a complete description and understanding of the discrepancy.

The underlying objective is to provide the highest level of maintenance service, thereby providing customers with safety and customer satisfaction. The use of a formalized process creates an environment for professionalism, cost effectiveness and quality improvement.

4.15.2. INOPERATIVE INSTRUMENTS AND EQUIPMENT

In certain circumstances, relief for aircraft discrepancies may be found through FAR 91.213, which states:

- Except as provided in paragraph (d) of this section, no person may take off an aircraft with inoperative instruments or equipment installed unless the following conditions are met:
 - An approved Minimum Equipment List exists for that aircraft.
 - The aircraft has within it a letter of authorization, issued by the FAA Flight Standards district office having jurisdiction over the area in which the operator is located, authorizing operation of the aircraft under the Minimum Equipment List. The letter of authorization may be obtained by written request of the airworthiness certificate holder. The Minimum Equipment List and the letter of authorization constitute a supplemental type certificate for the aircraft.
 - The approved Minimum Equipment List must –
 - Be prepared in accordance with the limitations specified in paragraph (b) of this section; and
 - Provide for the operation of the aircraft with the instruments and equipment in an inoperable condition.

- (4) The aircraft records available to the pilot must include an entry describing the inoperable instruments and equipment.
- (5) The aircraft is operated under all applicable conditions and limitations contained in the Minimum Equipment List and the letter authorizing the use of the list.
- (b) The following instruments and equipment may not be included in a Minimum Equipment List:
- (1) Instruments and equipment that are either specifically or otherwise required by the airworthiness requirements under which the aircraft is type certificated and which are essential for safe operations under all operating conditions.
 - (2) Instruments and equipment required by an airworthiness directive to be in operable condition unless the airworthiness directive provides otherwise.
 - (3) Instruments and equipment required for specific operations by this part.
- (c) A person authorized to use an approved Minimum Equipment List issued for a specific aircraft under part 121, 125, or 135 of this chapter shall use that Minimum Equipment List in connection with operations conducted with that aircraft under this part without additional approval requirements.
- (d) Except for operations conducted in accordance with paragraph (a) or (c) of this section, a person may takeoff an aircraft in operations conducted under this part with inoperative instruments and equipment without an approved Minimum Equipment List provided -
- (1) The flight operation is conducted in a -
 - (i) Rotorcraft, nonturbine-powered airplane, glider, or lighter-than-air aircraft for which a master Minimum Equipment List has not been developed; or
 - (ii) Small rotorcraft, nonturbine-powered small airplane, glider, or lighter-than-air aircraft for which a Master Minimum Equipment List has been developed; and
 - (2) The inoperative instruments and equipment are not -
 - (i) Part of the VFR-day type certification instruments and equipment prescribed in the applicable airworthiness regulations under which the aircraft was type certificated;
 - (ii) Indicated as required on the aircraft's equipment list, or on the Kinds of Operations Equipment List for the kind of flight operation being conducted:
 - (iii) Required by 91.205 or any other rule of this part for the specific kind of flight operation being conducted; or
 - (iv) Required to be operational by an airworthiness directive; and
- (3) The inoperative instruments and equipment are -
- (i) Removed from the aircraft, the cockpit control placarded, and the maintenance recorded in accordance with 43.9 of this chapter; or
 - (ii) Deactivated and placarded "Inoperative." If deactivation of the inoperative instrument or equipment involves maintenance, it must be accomplished and recorded in accordance with part 43 of this chapter; and
- (4) A determination is made by a pilot, who is certificated and appropriately rated under Part 61 of this chapter, or by a person, who is certificated and appropriately rated to perform maintenance on the aircraft, that the inoperative instrument or equipment does not constitute a hazard to the aircraft.
- An aircraft with inoperative instruments or equipment as provided in paragraph (d) of this section is considered to be in a properly altered condition acceptable to the Administrator.
- (e) Notwithstanding any other provision of this section, an aircraft with inoperable instruments or equipment may be operated under a special flight permit issued in accordance with 21.197 and 21.199 of this chapter.

Even with FAR rules as a tool to help the operator, problems may become apparent that will decrease the effectivity of the overall discrepancy correction process. For example:

- There may exist no common definition/understanding among the FAA, pilots and technicians that explains generic terms such as "return to service" and what kind of "corrective action" clears a discrepancy write-up.
- Discrepancies that are not safety- or flight-related and not covered by a MEL may ground an aircraft needlessly.
- Problem correction is best addressed through creation of action plans designed to provide a specific set of solutions to those concerns that may be raised.
- It may prove helpful to hold meetings with the FAA, pilots and technicians regarding current MEL use and application, discrepancy deferral processes and regulations.
- Time should be taken to define for all users "corrective action" and "return to service" (see next section).

Begin to document all discrepancies and corrective action in order to improve troubleshooting, speed of repair and the generation of a clean audit trail. Once all issues are addressed, the documentation of progress to date is

Figure 4.5: Discrepancy Flow Process for Technicians and Flightcrew Members

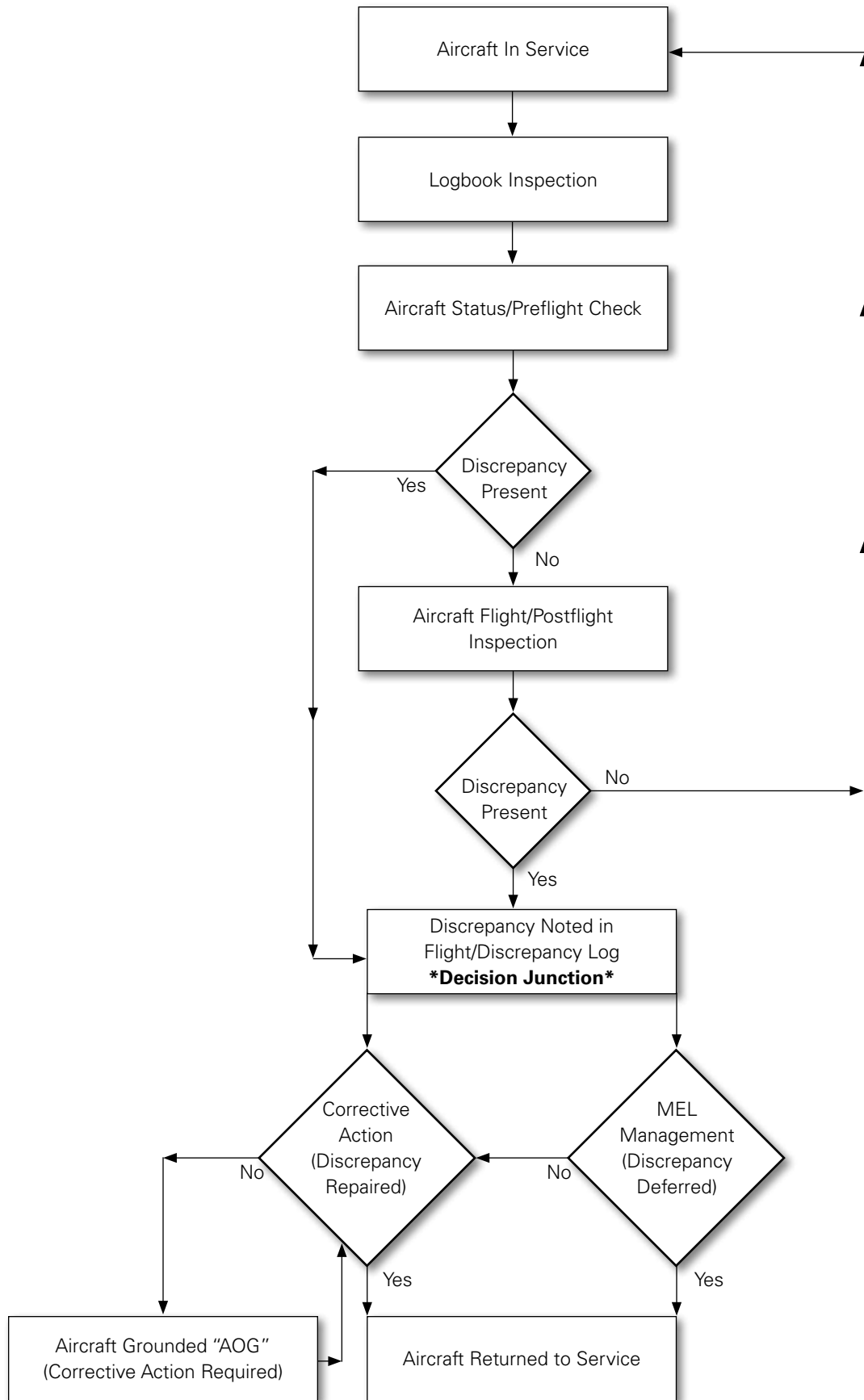


Figure 4.6: Discrepancy Log

All prior pages completed

Page # _____

Discrepancy Log/N _____

Flight Log #	Discrepancy	Deferral MEL Item #	<input type="checkbox"/> TFR to Deferred Discrepancy Log
Date		Corrective Action	<input type="checkbox"/> Removed from DDL if Necessary
Aircraft Hours			
Flightcrew		Signature, Cert. #, Date	

Figure 4.7: Deferred Discrepancy Log

All prior pages completed

Page # _____

Deferred Discrepancy Log

Flight Log #	Discrepancy	Deferral MEL Item #	Signature, Cert. #, Date
Date		Corrective Action	
Aircraft Hours			
Flightcrew		Signature, Cert. #, Date	

important. Documentation includes both definitions and graphics that clearly illustrate the desired discrepancy correction process. Such a reference also is the blueprint for an implementation plan.

Develop an aircraft maintenance binder with sections for a discrepancy log, postflight sign-offs, maintenance/inspection work cards or due date lists, oil consumption, and so on.

4.15.2.1. Carry Over List

In addition to an MEL, it is helpful to develop a Carry Over List for cosmetic or non-airworthy type items, as well as for the documentation of dents and scratches that have been measured and found to be within limits. This can save any questions during an FAA ramp check or audit, and also keeps these things from getting forgotten at the next inspection or interval at which they can be addressed.

4.15.3. DISCREPANCY MANAGEMENT DEFINITIONS

4.15.3.1. Corrective Action

Correction action is defined as reasonable, prudent and progressive steps taken to resolve a discrepancy or problem with a component or system. Corrective action is accomplished either by (1) verification of system or component integrity as required by the manufacturer’s maintenance manual or instruction for continued airworthiness prepared by the manufacturer or (2) other methods,

techniques and practices acceptable to the administrator. Corrective action can include progressive troubleshooting to resolve the fault, component changes or other action taken that demonstrates positive steps in resolving the problem.

4.15.3.2. Return to Service

Approval to return an aircraft to service is authorized by the holder of an appropriate mechanic’s certificate. Once an aircraft’s discrepancy, fault, deviation, or error has been addressed in a reasonable and prudent manner (corrective action taken) and the appropriate entries have been made to the aircraft discrepancy log, the aircraft may be returned to service.

See **Figure 4.5**, “Discrepancy Flow Process for Technicians and Flightcrew Members,” illustrating the movement and disposition of a discrepancy.

Once the discrepancy management procedures are in place, follow-up is required to ensure that it meets both current and future needs of all participants.

Elements to consider are:

- Monitoring of discrepancy write-ups and corrective actions to ensure that process is made routine

Figure 4.8: Request for Proposal (RFP) Template

Company Name _____	Date _____
Address _____	Aircraft Type _____
_____	Registration # _____
Telephone () _____	S/N _____
Fax () _____	Desired _____
E-mail _____	Start Date _____

Note: Please bid each line item separately.

Airframe:

- A. Inspections
 - 1. 150, 300, and 600-hour _____
- B. Service Bulletins
 - 1. 32-118 Landing Gear Mod _____
 - 2. 35-464 Oxygen Valve Upgrade _____
- C. Avionics
 - 1. C/W FAR 91.411 & 413 _____
 - 2. RVSM 2-year renewal _____
- D. Interior
 - 1. Air stair carpet replacement _____
- E. Paint
 - 1. None required _____

Engines: (m/n: AAAAAA)

- A. #1 Engine (s/n: 123456)
 - 1. 150-hour Inspection _____
 - 2. SOAP sample _____
 - 3. S/B 77-222 FCU mod _____
- B. #2 Engine (s/n: 123457)
 - 1. 150 & 300-hour Inspection _____
 - 2. SOAP sample _____

APU: (m/n: BBBB)(s/n: 987642)

- A. 300-hour inspection _____

Declarations: (Please declare the following separately)

- A. Estimated downtime (normal weekdays or can the weekends be utilized)
- B. Shop rates (both regular and overtime)
- C. Hazmat fee structure and is there a cap?
- D. Consumable fee structure and is there a cap?
- E. Local and state fee structure
- F. Coordination of warranty programs for aircraft directly with manufacturer?
- G. Records research included in the inspection flat rate? (if required?)
- H. Freight charge structure
 - 1. Flat fees
 - 2. Component rate fee I. Are any fees applied to incoming parts?
- J. Payment: methods, terms and conditions?
 - 1. Down payments
 - 2. Progress payments
- K. Parts cost structure, charges and fees.

- Validating that communication paths between pilots and technicians stay open
- Measuring the time between a noted discrepancy and the final correction

It is important that operators read and understand the FARs. Using an approved MEL along with an organized method of handling the day-to-day maintenance difficulties as outlined above can provide the high degree of operational flexibility necessary for a successful aviation department.

4.15.4. DISCREPANCY MANAGEMENT RECOMMENDATIONS

The MEL binder contains a copy of the Letter of Authorization with guidelines/procedures for deferrals. Records of discrepancies, deferrals and corrective action are kept in an aircraft maintenance binder under the title “Discrepancies” (see **Figure 4.6**).

A deferred discrepancy log is carried in the aircraft (see **Figure 4.7**).

4.16. Outside Maintenance

Occasionally, aircraft will need to visit outside maintenance providers, which may be due to staffing, scope of work, specialized tooling or scheduling convenience. This experience, either large or small in scope, should be handled in an organized and methodical manner. Timely implementation of these procedures will result in a better experience and a united service expectation. This structured Request for Proposal (RFP) process will better ensure a business driven decision, allowing you to consider not only the labor costs, but also a detailed view of the financials and other fundamental aspects that drive costs differently across service centers.

Planning for an outside maintenance event should be performed well in advance. Depending on the service center(s) you pick and their current workload, this planning should begin up to six months in advance. If the planned maintenance is sizeable in scope and cost, it is advisable to prepare the RFP document (see **Figure 4.8**) that outlines in detail the work being requested. By having a personalized RFP, you can dictate the desired format of the proposals. While being important to you (easier to compare “apples to apples”), it is just as important in fairness to the service centers to be competing on a level playing field. First and foremost, determine which service center(s) (typical procurement guideline is to entertain three bids) you would like to include in this process. Selection of these facilities should not be taken lightly.

Remember, cheaper is not always better. If price becomes the sole factor in the decision making process, the end result may not be what you actually desire.

Beyond the fact that the service center provider must possess the regulatory approval, keep in mind that regulatory approval does not always translate to manufacturer’s authorization. Regardless, it is still necessary to determine if the service provider can accomplish the projected work scope. Operators should check references to determine the quality received and satisfaction level of other operators. Later in the process it may prove useful to visit the facility prior to aircraft arrival to validate the ability of the provider to perform the work to your company’s satisfaction. The operator should have a facility audit type checklist to use in evaluating the facilities.

4.16.1. SERVICE CENTER SELECTION CHECKLIST

Items of a facility audit type checklist may include:

- Appropriate Repair Station ratings for work scope
- Manufacturer’s Authorization – service center status for your particular aircraft type can:
 - Impact their ability to handle warranty work
 - Affect the hourly rate for said warranty work
 - Impact the cost of parts passed on to you
- Engineering support
 - Identify if provided on staff or by outside designated engineering representative (DER)
- Training and safety policy for service center technicians, inspectors and shop
 - Review training records, specific to aircraft model
 - Review work force’s practical experience
 - Identify if service center utilizes full-time or contract technicians
- Quality Control department structure and practices
 - If a quality control (QC) department exists, review QC program and practical experience of inspectors

4.16.2. DEVELOPING THE REQUEST FOR PROPOSAL (RFP)

Using **Figure 4.8** as a template, develop an RFP that establishes a detailed work scope for the planned maintenance event. By requiring the proposal to be bid in a line-item format, the playing field has been leveled for each service center. Upon receipt of each proposal, the items can be transferred to a spreadsheet (see **Figure 4.9**) for visual display and an easy comparison of cost summaries.

The information your RFP should contain is as follows:

- Company name, address, and pertinent contacts
- Aircraft type, s/n, and registration
- Desired beginning date of work
- Aircraft operated under FAR _____ (i.e., 91,135, etc.)

- Detailed work scope

The detailed work scope should be divided into the following categories as applicable:

- Airframe
 - Inspections (best practice is to get a package quote for ease of comparison)
 - Maintenance items (bid each separately)
 - Service bulletins (bid each separately)
- Paint
 - Stripping process (check on their disposal method - fee structure for proper disposal)
 - Fuselage seams (do not rely on existing sealant; most-shops will replace sealant)
 - Primer
 - Base colors
 - Stripes/paint schemes
 - Miscellaneous (removal of flight controls, access panel screw detail, hinges)
 - Make sure it identifies what items are treated as standard quote and which items are treated as optional or extra charge
- Interior
 - Refurbishment details
 - Soft goods
 - Hardwoods
 - Floorplan changes
 - Floorplan drawings defining refurbishment Details (good shops will always provide these; ask to see samples of their quality and detail)
 - Materials listing and flammability certification (should be part of permanent aircraft records as this information may be needed during resale)
- Engines
 - Inspections (hot section, major periodical, core zone, mid-life, and/or overhaul)
 - Maintenance (discrepancies, spectra oil analysis program (SOAP) samples, etc.)
 - Service bulletins
 - Line replaceable units (LRU) overhauls
 - Auxiliary power units (APU) items (inspections, discrepancies, etc.)
- Avionics
 - Upgrades
- Overhauls
- New installations
- System testing/rectification (FAR 91.411, 91.413 and/or RVSM)
- Wiring diagrams and installation drawings (good shops will always provide these; ask to see samples of their quality and detail)
- Certification documentation for all new equipment and procedures (i.e., 8130-3, STC, FAA 337, JAR 1)
- New electrical load analysis (if applicable)
- Continued airworthiness requirements for all new equipment installed
- Disclosure Statements
 - Terms and conditions
 - Acquire text and forward to your appropriate procurement department for their review and recommendations.
 - Downtime for quoted maintenance
 - Specific beginning and ending dates (remember non-scheduled work could impact the delivery date)
 - Shop Rates
 - Avionics, airframe, and engine (rates will normally vary on each)
 - Are there overtime rates and when will they apply?
 - Overtime
 - Who authorizes the use? (One must understand the issues driving overtime requirements, and the terms need to be documented)
 - Flat Rates
 - Define what is included in the flat rates.
 - Discrepancies and Change Orders
 - What is the discrepancy and change order process including approvals?
 - Warranty
 - Will OEM warranty programs and specific campaigns be honored?
 - What is the warranty policy on parts and labor?
 - Hazardous Waste / Environmental Fees:
 - Costs and charges specific to work scope either by percentage or actual, and what are they based on?
 - Is there a maximum cap on the cost of hazmat fees?
 - Define method of Hazmat disposal and approval process.

Figure 4.9: RFP Analysis Spreadsheet Template

DELIVERABLES

Airframe Items	S.C. #1	S.C. #2	S.C. #3	S.C. #4
Inspections:				
1. 150,300,600-hour	_____	_____	_____	_____
Service Bulletins:				
1. 32-118 L/G Mod	_____	_____	_____	_____
2. 35-464 Oxygen Valve Upgrade	_____	_____	_____	_____
Avionics:				
1. FAR 91.411&413	_____	_____	_____	_____
2. RVSM 2-yr renewal	_____	_____	_____	_____
Interior:				
1. Air stair carpet install	_____	_____	_____	_____
Paint:				
1. If required	_____	_____	_____	_____
Engine Items				
Engine #1				
1. 150-hr Insp	_____	_____	_____	_____
2. SOAP	_____	_____	_____	_____
3. SB 77-222 FCU mod	_____	_____	_____	_____
Engine #2				
1. 150 & 300-hr Insp	_____	_____	_____	_____
2. SOAP APU Items	_____	_____	_____	_____
Inspections				
1. 300-hr Insp	_____	_____	_____	_____
Miscellaneous Items				
"Cost of Movement", Aircraft (Internal cost est.)	_____	_____	_____	_____
"Incentive Offerings" (Internal cost est.)	_____	_____	_____	_____
Less any vendor offerings (fuel, discounts, etc.)	_____	_____	_____	_____
Total Cost (Total all above items in each column)	\$ _____	\$ _____	\$ _____	\$ _____

DECLARATIONS

(List these for ease of comparison)

1. Downtime	_____	_____	_____	_____
2. Hazmat fees/cap	_____	_____	_____	_____
3. Consumable fees/cap	_____	_____	_____	_____
4. Shop rates	_____	_____	_____	_____
5. Local and State taxes	_____	_____	_____	_____
6. Records research	_____	_____	_____	_____
7. Insurance Coverage	_____	_____	_____	_____

- Consumables:
 - What is included in the definition of consumables (i.e. masking tape, acid brushes, etc.)?
 - Are there fees and how are they applied?
 - Is there a maximum cap on the cost of consumables?
- Freight Charge Structure
 - Is a fixed rate applied to each incoming part or based on a percentage of shipping costs?
 - What is the normal method of shipping?
- Records Research
 - Is this included at no additional cost, if not define fee structure?
- Parts
 - Are there fees associated with procurement? (Some shops charge a fee to evaluate the paper trail of received goods)
 - Identify cost structure of parts. (i.e. cost, cost plus or minus 10 percent)
 - What is the authorization process before part procurement?
 - What is the policy on restock or rectification charges based on mis-diagnosed components?
- Special Tooling
 - Does the company maintain the special tooling required to service my aircraft?
 - If not, will there be rental and freight charges associated with acquiring the needed special tooling?
 - Does the facility charge a fee for special tooling?
- Hangar Fees
 - Are there hangar fees in addition to normal operating fees?
 - If the aircraft is left in your facility for an extended time, are there storage fees applied?
- Taxes
 - What are the applicable taxes to the goods and services provided? (You will need to contact your tax advisor regarding the impact of these taxes relating to your state/country of registration)
- Insurance
 - Define types and amounts of coverage related to hangar keepers, liability, completed operations, workman's compensation, and war and terrorism coverage.

- Will your company be indemnified for any claims arising out of the services performed at your facility?
- Note: Generally, the area of insurance is often misunderstood and can subject your company to extraordinary financial exposure. Acquire the insurance information well in advance and forward to your company's risk management department for their evaluation and recommendations.
- Drug and Alcohol
 - Is there a drug and alcohol program at the facility?
 - Will documentation be provided, if requested?
- Payment Terms
 - What are your payment terms and conditions?
 - Are there deposits required?

When forecasting items monitored under a maintenance tracking program, remember to set the forecast date out to the next major outside maintenance. This will allow a rational thought process as to what needs to be accomplished.

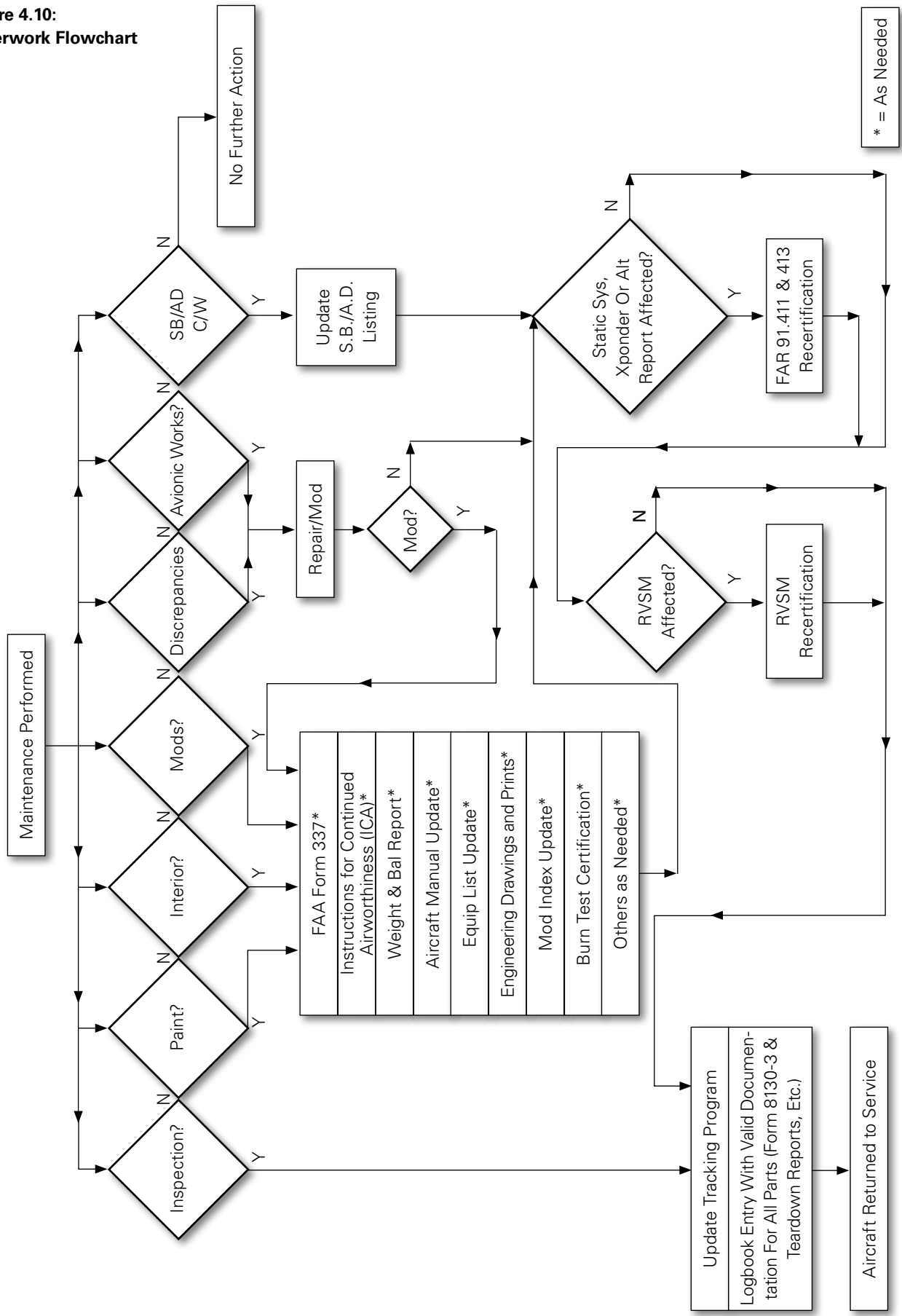
Once the bids have been received, the comparative analysis begins. Enter all the line item pricing on the RFP analysis spreadsheet (refer to the template in Figure 4.9), total all major categories and enter a brief summary of "disclosure statements." Notice the spaces for "cost of movement" and "incentive offerings." In the interest of good money management, always be conscious of the cost of moving the aircraft. The template is designed to give you a financial analysis of the work detail, with the major declarations listed for each center participating. While the financials are always critical, sometimes the declarations can define key business objectives that can differentiate the service centers complete expense materials. This comprehensive analysis is critical to the decision process and should be applied to fit your individual situation.

4.16.3. SERVICE CENTER COMMUNICATION

Once the service center selection is made, you can begin the process of communicating all the pertinent details for the work scope and discuss both the customer and service center expectations to ensure a successful experience. Communication is the key to the success.

- Upon arrival request a briefing session with all service center department representatives (i.e. avionics, airframe, paint, engine, etc.) to review work scope and provide an opportunity for any questions.
- Provide written information well ahead of time concerning any known incoming discrepancies.
- Establish a means for daily updates regarding work scope progress and cost implications, specifically needed when a second or third shift is in place

**Figure 4.10:
Paperwork Flowchart**



* = As Needed

Figure 4.11: Paperwork Checklist

Y

Logbook Entries

1. Return to service set forth by FAR 43
2. FAA Form 8130-3 and vendor teardown reports
3. Update service bulletin listing
4. Update airworthiness directive listing
5. Update maintenance tracking program
6. Update equipment list

If Painting Was Performed:

1. Record compliance with all airframe manufacturer's requirements
 - a) Control surface balancing
 - b) Comply with RVSM certification requirements
2. Update weight and balance report
3. Record color scheme in airframe logbook
4. Satisfy return-to-service requirements stated above

If Interior Work Was Performed:

1. Burn test certification on all materials
2. Update equipment listing
3. Update weight and balance report
4. Instructions for continued airworthiness (ICAs)
5. Record compliance with all airframe manufacturer's requirements
 - a) Was 91.411 or 91.413 affected? If yes, recertify the following:
 1. FAR 91.411 and FAR 91.413
 2. RVSM
 - b) Any systems affected by interior work needs logbook sign-off
6. Satisfy return-to-service requirements stated above

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If Major Repairs or Alterations Were Performed:

1. Copy of all FAA Form 337s 4.13.2, 4.13.3 and 4.13.4
2. Electrical diagrams for all changes
3. Update weight and balance report
4. Engineering drawings
5. Instructions for continued airworthiness (ICAs)
6. Update mod index
7. Update airplane flight manual with any supplements
8. Record compliance with all airframe manufacturer's requirements
 - a) Was 91.411 or 91.413 affected? If yes, recertify the following:
 1. FAR 91.411 and FAR 91.413
 2. RVSM
9. Satisfy return-to-service requirements stated above

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Note: This checklist is generic in format and should be tailored to your department's needs. Circumstances governing these changes could be but are not limited to the FAR under which you operate, the local Flight Standards District Office (FSDO) requirements, special equipment, etc.

- Request a single point of contact, a key service center manager that you can easily communicate with during the process.
- Have a company representative on site to monitor cost and progress.
- Establish that all discrepancies and change orders shall be approved and signed-off by your company representative prior to implementation.
- Ensure task cards or maintenance documentation is being used and provided with sign-offs.
- Meet with quality control department to preview a rough draft of the logbook entries and required documentation well in advance of the projected departure date.
- Pre-delivery and acceptance phase plan briefing with all departments for work performed.
- Obtain a copy of work order, airworthiness certification documentation (see **Figure 4.10**, Paperwork Flowchart, and **Figure 4.11**, Paperwork Checklist), and inspection guide (where applicable) before departure.
- Request an estimate of when the invoice might be received.

4.17. Spare Parts Inventory

Since all aircraft must be operated in airworthy condition, components that are not covered by an approved MEL or by FAR must be operable to maintain airworthiness, which necessitates that operators possess an inventory of spare parts for their aircraft. Aircraft dispatch criteria/level defined by the operator will dictate the level of inventory. Certain aircraft parts are expensive to purchase. The operator, balancing cost versus aircraft availability, should carefully consider the specific items selected for inventory. Furthermore, maintenance abilities should be considered to prevent the purchase of components that cannot be replaced in the field by the particular operator. The following suggestions have proven useful to operators when planning inventory purchases:

- Using the operator's approved Minimum Equipment List to determine those items that cannot be deferred, thereby grounding the aircraft.
- Determining the time necessary to remove and replace the specific item and comparing that to the time required having it delivered from the distribution center.
- Determining the manufacturer's recommended inventory levels, which may be most beneficial in selecting consumable spares.
- Determining shelf-life considerations for time-controlled stock.
- Sharing experiences with other operators of the same aircraft type.

- Learning current fleet tendencies from field service representatives.
- Determining the operator's proximity to parts distribution sites and transportation hubs, which will affect the timeliness of shipments.

All parts must be purchased from reputable companies. Be aware of parts priced well below market value. The operator must ensure that the parts are accompanied by proper certification paperwork and, in the case of time-controlled components, that the current TSO/TSI is documented. Life limited components have documentation that follows a part until it is scrapped.

When determining quantity, the operator can reduce stock levels via thorough planning. Upcoming inspections can be examined for consumable requirements, and an order can be placed to ensure that parts arrive just prior to the commencement of work.

A means for the operator to determine stock quantity and value should be incorporated. This determination may be made through the use of computerized inventory management software or a simple index-card system. A method to determine parts usage over time should be considered to enable low utilization parts to be replaced with higher use items.

Inventory should be stored in a safe location. This area should be climate controlled to prevent damage or corrosion. Non-airworthy items should be properly identified and kept segregated from useable stock. A lockable storage cabinet is ideal for this and will help to ensure that these parts do not make their way onto the aircraft.

The overall complexity of the inventory management process is dependent upon the individual operation. Operators with large departments and several aircraft may need far more processes in place to ensure proper asset management than a small department. Regardless of department size, standard practices and processes should be implemented to ensure that cost is managed and that aircraft availability is properly managed.

4.18. Maintenance Technician Duty Time

NBAA recommends that its Member Companies develop a policy for limiting maintenance technician duty time. Long duty cycles are a principle cause of both physical and mental fatigue. Physical fatigue can lead to personal injury, and mental fatigue can lead to mistakes. These mistakes can lead to serious injury or damage to the aircraft. With this in mind, flight department managers should carefully consider duty times for their maintenance personnel to maintain the highest level of performance and to ensure personal and flight safety. Because of the ad hoc schedules of business aviation, it is difficult to estimate work related sleep deprivation or circadian disruptions. Any Program must have

enough latitude to handle peak workloads without over-staffing. Management should be aware of the cumulative effects of long hours or insufficient rest, and the effects of circadian de-synchronization to manage the technician's time properly.

When developing a policy, the following areas should be considered along with the examples shown:

- Maximum work day
Example – 14 hours
- Maximum work week
Example – 60 hours in five consecutive work days, or 68 hours in six consecutive work days
- Minimum off time between work days
Example – 10 hours
- Minimum off time between work weeks
Example – 24 hours for five consecutive work days, or 48 hours for six consecutive work days

There are times when the aviation department may not be able to adhere to these guidelines. In this case, there should be a written process in place to handle any deviation appropriately.

4.19. Compensation of Maintenance Personnel

NBAA believes that a stable workforce adds great value to the corporate flight department. Aviation professionals are by nature highly motivated and require specialized training. Proper investments made in employees for training, compensation and benefits should aim for employee retention and workforce stability. Wages and associated compensation and benefits should include vacations, sick leave, uniforms, a 401(K) plan, an insurance package (including accident, health, dental, travel, disability and liability), a competitive retirement package and incentive compensation, if available. Factors governing this compensation would include the geographic location of the flight department, local competition for labor, the type of certificates held by the technician, current position held by the technician, and the technician's documented experience, tenure and duty requirements. Best management practices include a review of industry salary surveys in order to maintain a competitive advantage.

Federal and state labor rules should be fully examined by qualified individuals prior to a department establishing their compensation plan. Labor laws dictate that all maintenance personnel not directly supervising others or not in a management function are paid as non-exempt (hourly) employees. This includes the payment of overtime wages for hours in excess of the standard workweek. Non-exempt employees should not be regarded as less professional than the traditional exempt or salaried employee by virtue of their method of compensation. It is simply a method to ensure that employees are compensated for their hours worked and meet applicable labor rules.

4.20. Safety Programs

A primary goal of every maintenance department is to create a safety culture, or safety standard, aimed at reducing the risk exposure to employees and sub-contractors and avoiding unnecessary damage to equipment.

NBAA Member Companies need to establish and maintain an ongoing safety program to seek out hazards to safe operations and to implement programs to reduce risk and eliminate accidents in the workplace. Standards for a safety program should be based on those of OSHA, EPA, NIOSH, Code Of Federal Regulations (CFR), National Safety Council, Federal and state directives and others as deemed applicable to the work place, application and industry.

4.20.1. LOCKOUT/TAGOUT PROCEDURES

Industry practices and procedures used in machinery shops should be applied to the aircraft maintenance environment. Work tasks are identified through cautionary notes, or warnings. These notes prompt required action to prevent inadvertent operation of systems during specific events. For the most part, these tagout procedures identify and secure an aircraft system or control that is rendered inoperative for and during maintenance to prevent electric, hydraulic, or pneumatic power from being applied.

Cautionary notes delineate specific procedures for maintenance technicians to render a system or control inoperative. Use of an identifier tag on the appropriate control – such as a circuit breaker, flap handle, throttle, hydraulic pump, pneumatic system control panel, or combination of flight control or circuit breaker – is an excellent practice.

In addition to the tagout system defined above, flight controls such as flaps, slats, landing gear and thrust reversers need to be blocked out or pinned out using appropriate means that generally are listed by the manufacturer.

The lockout/tagout safety program should entail the following:

- Detailed procedures outlining an effective communication program, references that define lockout requirements and processes to be followed to safely lockout/tagout sources of stored energy. Recognition of hazardous energy sources, types of energy sources specific to particular makes of aircraft, means and methods to safely lockout/tagout, as well as removal of the lockout/tagout and re-activation procedures.
- An audit/inspection program, outlining periodic inspections to ensure that the program is working effectively and achieving the desired level of safety and personal protection.
- A training program, outlining the purpose of the program, comprehension of the program, recognition of hazards, and review of application to specific aircraft type in fleet.

Reference material: Code of Federal Regulations 29 (CFR).

4.20.2. CONFINED SPACE ENTRY PROGRAM

The purpose of the confined space entry safety program is to delineate procedures for the entry of confined spaces and fuel tanks by maintenance personnel when performing routine checks and/or when performing nonroutine repairs or modifications. The program should entail the procedures and equipment necessary to assure that confined space entry and internal fuel tank maintenance is accomplished in a manner consistent with aviation industry standards for the personal safety of maintenance personnel. While not all spaces contain the potential for hazardous atmospheres, they could exhibit potential hazards in high temperature situations.

The program is divided into two segments: confined space and permit-required confined space. A confined space is a space that is large enough for an individual to bodily enter, has restricted means of entry or exit and is not intended for continuous occupancy. Examples of confined spaces are aft maintenance compartments, fuel tanks and avionics bays.

A permit-required confined space has the potential to contain a hazardous atmosphere, such as welding fumes, carbon monoxide, solvent vapors and/or flammable or oxygen-deficient atmospheres, i.e. fuel tanks. This segment is further defined as a confined space that has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or a floor that slopes downward and/or tapers to a smaller cross-section.

A confined entry program should include:

- The basic program should delineate specific procedures for both types of confined spaces. Program highlights should include definition of confined space and permit-required confined space, and control or permit procedures when entering confined spaces, including management's oversight role. Furthermore, delineate specific procedures on how to test for vapor hazards, ventilation and purging procedures; responsibilities of all individuals involved in and around the confined space, including the immediate supervisor; and specific apparel and restrictions/cautions, such as but not limited to jewelry and tooling. Very detailed procedures should be established for attendants stationed outside a permit-required space, as well comprehensive rescue procedures.
- With respect to the permit-required confined space program, it should delineate atmospheres that expose individuals to risk of death, incapacitation, impairment of ability to self rescue (that is, escape unaided from permit space), injury or acute illness. Atmospheric concentration exposure limits should be delineated. Maximum doses or permissible exposure limits are published in 29 CFR 1910, Subparts G and Z.
- A comprehensive training program is essential and should outline the purpose of the safety program, recognition of atmospheric conditions, use of testing and purging equip-

ment, responsibilities of individuals and detailed rescue procedures.

Reference material: Code of Federal Regulations 29 (CFR) 1910, Subpart G – Occupational Health and Environmental Control; Subpart Z – Toxic and Hazardous Substances; and National Fire Protection Association (NFPA) 70 National Electrical Code.

4.20.3. RESPIRATORY PROTECTION PROCEDURES

The purpose of the respiratory protection procedure safety program is to protect individuals from toxic chemical agents. It delineates the use and maintenance of respiratory protective equipment, allowing employees to work safely in hazardous work environments in compliance with Federal and state regulations. The program should address the requirements for the safe use of respiratory protection within an aviation maintenance environment.

A respiratory protection program should include the following:

The selection of respirators outlining the proper respirators for use when working within fuel tanks and other tasks when the air contaminant has not been quantified. When the contaminant has not or cannot be measured, delineate the exposure that is considered immediately dangerous to life and health and when a full-face piece supplied air respirator should be used. Outline the dangers of how respirators should be used, face seal checks, positive and negative pressure checks and how to detect leakage or respirator effectiveness. The program should stipulate which respirators meet the NIOSH standard (defined as a filter that has at least 99.97 percent efficiency in removing monodisperse particulate of 0.3 micrometers in diameter). Certified NIOSH 42 CFR 84 particulate filters are the N100, R100, and P100 filters.

- Outline procedures that delineate the inspection of respirators as well as the maintenance, care, cleaning and disinfectant procedures. Outline the annual requirement for fit testing of positive and negative respirators. Fit testing should occur whenever a different respirator is used or when physical changes occur in individuals (i.e., facial scarring, dental change, cosmetic surgery, obvious change in body weight, or if the individual states that the fit is unacceptable). The Portacount fit test protocol should be used. A minimum fit factor pass level of 100 is required for a half-mask respirator, and a minimum fit factor pass level of 500 is required for negative pressure respirators.
- This program necessitates a medical evaluation for the individual required to wear respirators subsequent to fit testing. A licensed healthcare professional should administer the evaluations and supply written recommendations determining the individual's ability to use a respirator. This should cover an evaluation of the environment or specific exposure as well as the individual's medical evaluation and limitations.

- Because of the complexity of this program a detailed training program should outline the value of this respiratory protection; when respirators are to be used; and proper fit, usage, maintenance, inspection, storage and recognition of medical signs and symptoms that may limit or prevent effective use.

For those organizations/individuals who are unfamiliar with the interpretation of the regulatory requirements, it might be best to consult a risk management professional to assist you in developing a program tailored to your equipment and operation.

Reference material: Code of Federal Regulations (CFR) 1910.139, CFR 1910.155, American National Standards Institute (ANSI) Z88.2, and NIOSHA 42 CFR 84 Particulate Filters.

4.20.4. ROLLING STEPLADDER/STAIR SAFETY PROGRAM

The purpose of the rolling stepladder/stair safety program is to outline the required methods for using mobile ladders and stairs during aircraft maintenance operations. The use of rolling ladders and stairs should be (1) in accordance with manufacturer's specifications, (2) intended for a task or purpose, (3) in good physical condition and (4) stable. The rolling stepladder/stair should be capable of being locked down to prevent movement, and have fixed steps or hand-rails, secure and free of excessive movement.

A rolling stepladder/stair safety program should include the following:

- Procedures outlining the height and load requirements of tasks prior to selection of ladder or stair. Determine appropriate device for task, visual inspection of ladder/stair, lock-down, chock or tie off and ascending and descending techniques.
- Training program outlining the value of this program, including training requirements, visual inspections, lock-down procedures, set-up, positioning, ascending and descending procedures as well as storage and general care requirements.

4.20.5. FALL PROTECTION

OSHA governs compliance with Fall Protection Regulations under the following regulations. More information can be found at www.osha.gov.

OSHA Standards

General Industry

- 1910.23, Guarding floor and wall openings and holes
- 1910.66, Powered platforms for building maintenance
 - App A, Guidelines (Advisory)
 - App C, Personal Fall Arrest System (Section I – Mandatory; Sections II and III – Non-Mandatory)

- 1910.132, General Requirements (Personal Protective Equipment)
- 1910.269, Electric Power Generation, Transmission, and Distribution. References 1926 Subpart M and contains additional requirements for fall protection

Shipyard Employment

- 1915.159, Personal fall arrest systems (PFAS)
- 1915 Subpart I App B, General Testing Conditions and Additional Guidelines for Personal Fall Protection Systems (Non-mandatory)
- 1915.160, Positioning device systems

Long Shoring

- 1918.85, Containerized cargo operations; includes requirements for fall protection
- Preambles to OSHA Standards
 - Fall Protection in the Construction Industry (1994, August 9)
- OSHA Directives
 - Focused Inspection Program for Intermodal Container Top Fall Protection. CPL 2-1.27 (1998, May 12), 7 pages. Provides guidance for enforcing 1918.85
- Review Commission and Administrative Law Judge Decisions – The Occupational Safety and Health Review Commission (OSHRC) is an independent Federal agency created to decide contests of citations or penalties resulting from OSHA inspections of American work places. To locate decisions related to this topic, search for keywords at the OSHRC site.
- Standard Interpretations and Compliance Letters – Standard Interpretations and Compliance Letters related to 1926 Subpart M, Fall Protection:
 - 1926.500
 - 1926.501
 - 1926.502
 - Authority for 1926 Subpart M

4.21. References for Maintenance Operations

Below is a list of materials that may prove helpful if further reference is needed for your particular operation. When attempting to apply FARs, a positive, professional working relationship with the local Flight Standards District Office should be developed to ensure that all regulations are properly and mutually understood. Specifically, caution should be exercised regarding the applicability of each section. When in doubt, work with your local FAA contact. This may prove to be especially beneficial in the event of a difference in interpretation between the FAA and any given maintenance activity.

A great deal of time and effort may be saved and risk of violations minimized.

A wide range of regulations covers FAA standards for aircraft maintenance. Listed below are examples relative to corporate operations.

Manuals

- Airframe
- Powerplant
- Component Maintenance

Federal Aviation Regulations

- Part 21 – Certification Procedures for Products and Parts
- Part 23 – Airworthiness Standards: Normal, Utility, Acrobatic and Commuter Category Airplanes
- Part 25 – Airworthiness Standards: Transport Category Airplanes
- Part 27 – Airworthiness Standards: Normal Category Rotorcraft
- Part 29 – Airworthiness Standards: Transport Category Rotorcraft
- Part 33 – Airworthiness Standards: Aircraft Engines
- Part 35 – Airworthiness Standards: Propellers
- Part 39 – Airworthiness Directives
- Part 43 – Maintenance, Preventive Maintenance, Rebuilding and Alteration
- Part 45 – Identification and Registration Marking
- Part 65 – Certification: Airmen Other Than Flightcrew Members
- Part 91 – General Operating and Flight Rules
 - Subpart C – Equipment, Instrument and Certificate Requirements
 - Subpart E – Maintenance, Preventive Maintenance, and Alterations
- Part 119 – Certification: Air Carriers and Commercial Operators
- Part 121 – Operating Requirements: Domestic, Flag, and Supplemental Operations
 - Subpart J – Special Airworthiness Requirements
 - Subpart K – Instrument and Equipment Requirements
 - Subpart L – Maintenance, Preventive Maintenance, and Alterations
 - Subpart V – Records and Reports
- Part 125 – Certification and Operations: Airplanes Having a Seating Capacity of 20 or more passengers or a Maximum Payload Capacity of 6,000 pounds or more

- Part 135 – Operating Requirements: Commuter and On demand Operations
 - Subpart C – Aircraft and Equipment
 - Subpart I – Airplane Performance Operating Limitations
 - Subpart J – Maintenance, Preventive Maintenance, and Alterations
- Part 145 – Repair Stations
- Part 147 – Aviation Maintenance Technician Schools

Advisory Circulars

Any applicable Advisory Circulars that are in the 20 series (aircraft) or 43 series (maintenance). A selected list appears below. Note suffixes change occasionally, so be sure to check for currency.

- 20-65 – U.S. Airworthiness Certificates and Authorizations for Operations of Domestic and Foreign Aircraft
- 20-77 – Use of Manufacturers Maintenance Manuals
- 20-106 – Aircraft Inspection for the General Aviation Aircraft Owner
- 20-109A – Serviced Difficulty Program (General Aviation)
- 20-110J – Index of Aviation Technical Standard Orders
- 20-114 – Manufacturers Service Documents
- 20-117 Hazards Following Ground Deicing and Ground Operations in Conditions Conducive to Aircraft Icing
- 20-126E – Aircraft Certification Service Field Office Directory
- 20-131A – Airworthiness and Operational Approval of Traffic Alert and Collision Avoidance Systems (TCAS II) and Modes S Transponders
- 20-133 – Cockpit Noise and Speech Interference Between Crewmembers
- 20-134 – Test Procedures for Maximum Allowable Airspeed Indicators
- 20-136 – Protection of Aircraft Electrical/Electronic Systems Against the Indirect Effects of Lightning
- 20-138 – Airworthiness Approval of Global Positioning System (GPS) Navigation Equipment for use as a VFR and IFR Supplemental Navigation System
- 21-9A – Manufacturers Reporting Failures, Malfunctions, or Defects
- 21-12A – Application for U.S. Airworthiness Certificate, FAA Form 8130-6
- 21-18 – Bilateral Airworthiness Agreements
- 21-20B – Supplier Surveillance Procedures
- 2123 – Airworthiness Certification of Civil Aircraft Engine, Propellers and Related Products

- 21-24 – Extending a Production Certificate to a Facility Located in a Bilateral Airworthiness Agreement Country
- 21-26 – Quality Control for the Manufacture of Composite Structures
- 21-29B – Detecting and Reporting Suspected Unapproved Parts
- 21-22 – Quality Assurance of Software Used in Aircraft or Related Products
- 21-35 – Computer Generated/Stored Records
- 21-40 – Application Guide for Obtaining a Supplemental Type Certificate
- 21-3032H – Announcement of Availability: Parts Manufacturers Approvals
- 43-3 – Nondestructive Testing in Aircraft
- 32-4A – Corrosion Control for Aircraft
- 43-6A – Automatic Pressure Altitude Encoding Systems and Transponders Maintenance and Inspection Practices
- 43-7 – Ultrasonic Testing for Aircraft
- 43-9 – Maintenance Records
- 43-10A – Mechanical Work Performed on U.S. and Canadian Registered Aircraft
- 43-12A – Preventive Maintenance
- 43-13-1A – Acceptable Methods, Techniques and Practices Aircraft Inspection and Repair
- 43-13-2A – Acceptable Methods, Techniques and Practices – Aircraft Alterations
- 43-13-2A – Change 2
- 140-7G – Federal Aviation Administration Certificate Maintenance Agencies Directory
- 183-35E – Designated Airworthiness Representative (DARs), Designated Alteration Stations (DASs) and Delegation Option Authorization (DOA) Directory
- 183-29.1CC – Designated Engineering Representatives
- Annex 10 – Aeronautical Telecommunications
- Annex 11 – Air Traffic Services
- Annex 12 – Search and Rescue
- Annex 13 – Aircraft Accident and Incident Investigation
- Annex 14 – Aerodromes
- Annex 15 – Aeronautical Information Services
- Annex 16 – Environmental Protection
- Annex 17 – Security: Safeguarding International Civil Aviation Against Acts of Unlawful Interference
- Annex 18 – The Safe Transport of Dangerous Goods by Air

Other FAA Documents

- FAA Order 8300-10D Airworthiness Inspectors Handbook
 - Volume 2, Chapter 3, “Evaluate Category I/II/III/IIIA Landing Minimum Maintenance/Inspection Programs”
 - Volume 2, Chapter 35, “Introduction to FAR Part 91 Related Tasks”
 - Volume 2 Chapter 36, “Evaluate/Inspect FAR Part 91 Operators Aircraft” Section 1, parts 5, Inspection Programs, Part 7, Computerized Recordkeeping and Alerting Programs
 - Volume 2 Chapter 60, “FAR Part 121/135” Section 1 General
 - Volume 2 Chapter 62, “Evaluate 121/135 Management Personnel Qualifications”
 - Volume 2 Chapter 64 “Evaluate Continuous Airworthiness Maintenance Program Reunion” Section 1, 9, 11
 - Volume 2 Chapter 70 “Evaluate FAR Part 121/135.411 (A) (2) Maintenance Training Program Record” Section 1 (11)
 - Volume 2 Chapter 83 “Evaluate FAR Part 135 (9 or less) Approved Aircraft Inspection Program”
 - Volume 2 Chapter 84 “FAR Part 121/135 Operations Specifications Section 1 (29) (33) (35)
 - Volume 2 Chapter 91, “Evaluate FAR Part 135 (nine or less) Operator/Applicant’s Inspection and Maintenance Requirements” Section 1
 - Volume 2 Chapter 92 “Evaluate FAR Section 135.411 (A) (1) Operators Maintenance Records” Section 2 (1) (3)
 - Volume 2 Chapter 94 “Evaluate FAR Part 135.411 (A) (2) Operators Maintenance Recordkeeping System”
- FAA Order 8700.1 General Aviation Operators Inspectors Handbook
 - Volume 2, Chapter 55 “Inspect and Executive/Corporate Operator”
 - Volume 2 Chapter 56 “Conduct and FAR Part 91 Ramp Inspection”
 - Volume 2 Chapter 58 “Approve a Minimum Equipment List”

ICAO Documents

- Annex 1 – Personnel Licensing
- Annex 2 – Rules of the Air
- Annex 3 – Meteorological Service for International Air Navigation
- Annex 4 – Aeronautical Charts
- Annex 5 – Units of Measurement to be Used in Air and Ground Operations
- Annex 6 – Operation of Aircraft
- Annex 7 – Aircraft Nationality and Registration Marks
- Annex 8 – Airworthiness of Aircraft
- Annex 9 – Facilitation

APPENDIX A: AIRCRAFT INSURANCE

While any insurance policy is in effect, your aviation department, the personnel responsible for handling the company insurance, your aviation insurance broker and your aviation attorney should remain in close communication. Coverage and premiums may vary as the aircraft is modified, changes in flightcrews occur, normal routes of travel are changed, or travel outside the United States takes place. The aviation department should be familiar with any insurance warranties relating to the flightcrew(s) and/or their qualifications.

A summary of insurance coverage should be included in the aviation department's operations manual.

The purchase of insurance protection against financial loss resulting from aircraft and/or airport operation accidents is a decision the individual operator must make after thorough discussion with insurance consultants and the company's legal department. The following summary of insurance coverage available to the owner or operator of an aircraft is offered for consideration.

The basic coverage types are physical damage to the aircraft (hull insurance), aircraft liability insurance and airport liability (premises) insurance. Included in this appendix is a brief description of these types of coverage and variations available in the aviation insurance market.

A.1. Physical Damage (Hull Insurance)

This coverage provides for payment to the owner of the aircraft for physical loss of or damage to the aircraft, including engines, propellers, instruments and equipment usually and ordinarily attached to the aircraft. Unlike auto insurance, which is written on an actual cash value basis, aviation hull insurance is written on a stated or agreed value basis normally equal to the current market value of the aircraft. It covers the interest of both the owner and other persons or organizations identified in the policy that may have a financial interest in it, such as a bank. This coverage generally is purchased on an all-risk basis, meaning all risks are covered except what is excluded. The following three types of all-risk coverage may be purchased:

- **All risk** – This is the broadest possible form of insurance. With few exceptions, it covers the owner against almost any physical loss or damage to the plane on the ground and in the air.
- **All risk not in flight** – Similar to all risk but it covers the aircraft only on the ground, including taxiing.
- **All risk not in motion** – Covers the aircraft only on the ground while not in motion.

One important exclusion of note is the war risk perils. As the name implies, this coverage responds to physical loss

or damage to the aircraft caused by an act of war. It is more important to note the war risk perils also cover such exposures as confiscation, seizure, arrest and detention, sabotage, hijacking and terrorist acts. Since corporate aircraft frequently travel internationally, this coverage should not be considered optional.

Most physical damage policies contain the following pertinent provisions and exclusions:

- **Deductibles** – Generally, a deductible for not-in-motion and in-motion losses is a standard feature of policies covering fixed-wing aircraft. Rotorcraft may have an in-motion deductible based on a percentage of the insured value. Usually, turbine fixed-wing aircraft are written on a NIL (no-deductible) basis. Due to the low frequency of claims in aviation, increasing the hull deductible rarely produces any advantage in reducing the overall premium.
- **Territory** – Most corporate aviation insurance policies cover operations on a worldwide basis; however, it is prudent to confirm your policy territory with your broker prior to any trip outside of the contiguous United States. Keep in mind some countries such as Mexico and the European Union states require additional coverage prior to entering their airspace. If you are using an international trip handler, they will generally assist you with compliance.
- **Automatic attachment** – Most policies contain a provision for automatic attachment of newly acquired aircraft for a limited period after the acquisition of the new aircraft, provided you purchase and register the aircraft in the same name as your current aircraft. However, most policies will contain a limitation on the insured value of the new aircraft until it is reported and accepted by the insurance company.
- **Pilot requirements** – Depending upon the type of aircraft involved, most aircraft policies are written to be applicable only while the aircraft is operated by named pilots or pilots meeting certain minimum qualifications. Pay close attention to the recurrent training requirements as most policies warrant the pilots have completed aircraft-specific recurrent training within the preceding 12 months of any flight at an underwriter approved facility. Also, if a pilot not meeting the prescribed requirements is flying the airplane and a loss occurs, insurers may deny coverage.
- **Total loss value** – Most policies are written on a "stated or agreed value" basis, which provides that, in the event of a total loss, the company will pay the insured value stated in the policy, regardless of the aircraft's market value. It is important to review the current market value of the aircraft on an annual basis and adjust the insured value of the aircraft accordingly. The goal is not to be under or over insured; both have negative consequences.
- **Unearned premium insurance** – Most policies allow for a pro rata return premium in the event of a total loss. How-

ever, some policies do not, and this should be verified if the company wishes to be protected against the loss of its premium in the event of a total loss.

Most policies usually exclude loss caused by:

- War risk
- Wear and tear, including mechanical or electrical breakdowns
- Conversion and embezzlement
- Violation of the usage clause (i.e., allowable reimbursement)
- Diminution of value

A.2. Aircraft Liability

This type of policy is designed to cover the insured's legal liability to others for bodily injury and property damage resulting from the ownership, maintenance or use of the aircraft. Such policies offer coverage for the defense of lawsuits brought against the insured resulting from a covered peril, even if the suit is groundless. Although financial loss through liability claims may not be as obvious as loss by reason of the damage or destruction of an aircraft, it can be one of the largest catastrophic exposures faced by an aircraft owner with the possibility to jeopardize or wipe out an individual's or company's assets. For this reason, it deserves the closest scrutiny when examining your insurance program.

A summary of basic liability coverages are as follows:

- *Bodily Injury Liability* (excluding passengers). Protection for the insured against bodily injury or death claims brought by members of the public other than passengers in the aircraft.
- *Passenger Bodily Liability*. Protection for claims for bodily injury or death to any passenger in the aircraft at the time of the accident.
- *Property Damage Liability*. Protection against claims from others for damage to property, including the loss of use of such property.
- *Medical Payments*. Coverage for the reasonable expenses of necessary medical, surgical, ambulance, hospital and professional nursing services resulting from bodily injuries to passengers in the aircraft, and reasonable funeral expenses resulting from death. It is paid regardless of whether the owner is legally liable for such bodily injury.
- *Guest Voluntary Settlement*. Most insurers offer this coverage (as a part of and not in addition to) the passenger bodily injury liability limit, for dismemberment or death of passengers and crews arising out of an accident. This coverage offers a specified settlement to the injured party or another person claiming for him/her. It is offered in lieu of the injured person's legal right to make a claim

against the insured, regardless of legal liability, and it is paid in exchange for a release from further claims against those parties insured under the contract. The amounts purchased vary from \$100,000 to \$2 million per seat with \$250,000 to \$500,000 being the most common limits.

Coverage as outlined herein normally is subject to the following provisions and exclusions:

- *Territory*. Same as physical damage.
- *Coverage*. Normally extends for insured's use of temporary substitute aircraft during breakdown, repair, servicing, etc.
- *Automatic Coverage*. For a limited time for newly acquired aircraft of similar size.
- *Definition of Insured*. Popularly known as an "omnibus clause," this extends the policy protection to other persons or organizations that may be judged legally responsible for the use of the aircraft, excluding, however, those engaged in the commercial aviation business and claims brought by one employee against another employee of the same employer.
- *Pilot Requirements*. Same as physical damage.
- *Contractual Liability*. Policy does not cover the liability assumed by the insured under a contract or agreement, but it may be amended to cover certain contracts. For this reason, all aviation related contracts the insured may enter into should be submitted to the underwriter for consideration/approval.

As a rule, an aircraft owner should purchase as much liability coverage limit as one can afford. This decision is best coordinated with your aviation insurance broker and aviation insurance attorney. Factors to consider in determining a prudent coverage limit include the number of passenger seats in the aircraft, average passenger load, passenger composition (employee versus guest), what assets need to be protected, and finally if you have an umbrella policy the covers the aviation peril, you will need to make certain your aviation liability limit meets the minimum required umbrella limit.

Aircraft liability limits are usually written on a single limit per occurrence basis for Bodily Injury and Property Damage Liability, Including Passengers. This option provides a set dollar amount for each occurrence and is applicable for all bodily injury and property damage claims arising out of one occurrence. Coverage can also be written on a single limit per occurrence basis for Bodily Injury and Property Damage Liability, Including Passengers with passenger bodily injury liability limited to a dollar amount per passenger, typically \$100,000 or \$250,000 per passenger. This is a less desirable format for writing the liability coverage as it limits the amount of coverage provided for suits brought by an injured passenger which is typically the most likely liability exposure.

A.3. Non-Ownership Aircraft Liability

This coverage is available as an extension to the owned aircraft liability policy or as a separate policy. This protects the named insured for liabilities resulting from the use of certain aircraft he or she does not own. The possibility of exposure to liability suits through the use of non-owned aircraft often is overlooked. However, remote as it may appear, if a person or organization (either directly or through an agent) rents, charters, or even borrows an aircraft for use by or on behalf of the person or organization, they may be subject to lawsuits because of bodily injury or property damage that results from their use of the non-owned aircraft. Again, the purchase of such insurance and proper limits of liability for adequate protection is a matter to be decided by competent insurance consultants and legal advisors.

The average non-ownership aircraft liability policy follows the outline set forth for aircraft liability. The insurance for non-ownership aircraft liability is written on an excess and/or contingent basis, meaning that coverage does not respond until other available insurance is exhausted. That means the policy that insures the airplane would respond first. It is important that the user of the non-owned aircraft ascertain that the aircraft owner's "primary" policy protects the user as well as the owner.

A.4. Airport Liability Insurance

If the owner of an aircraft also owns or rents hangar, office, lounge, or ramp space, it may be practical to explore the need for airport liability insurance. This insurance is designed to cover liability to the public for bodily injury or property damage arising out of hazards in the premises to which guests or other invitees may be exposed. For example, it would protect the operator against injuries suffered by a salesman who fell on a slippery floor or tripped over a chock or extension cord.

Some aircraft operators also provide services such as aviation technician service or storage of aircraft owned by others. Liability resulting from these relationships normally is not covered under the basic aircraft operations insurance policy and a separate airport liability policy is required. In the storage of another owner's aircraft, there is the possibility of damage to that aircraft through a negligent act of the hangar owner or renter, or an agent, and this can be protected by a hangar keeper's liability endorsement to an airport liability policy. Hangar keeper's liability does not cover acts of God (such as lightning) that the hangar owner is powerless to prevent. The aircraft owner's policy would cover such damage. Another coverage provided under an airport policy is liability resulting from offering aircraft products and services to other persons. A business aircraft owner will rarely have a significant exposure but it is possible if they hangar or service aircraft belonging to others.

A.5. Worker's Compensation and Employers Liability Insurance

Unlike other forms of insurance protection, which are optional, the laws of the individual states require operators to carry worker's compensation insurance. Whether or not an individual operator is subject to his state's law and thus is required to provide this coverage normally depends on the number of persons employed. In some states, one employee is sufficient to bring an employer under the law; in others, the minimum is

10 employees. An insurance agent or broker should be consulted to determine specific state requirements.

Worker's compensation laws provide for the payment of compensation and other benefits to employees who sustain injuries or contract disease arising out of or occurring in the course of employment. These laws set forth the specific amounts payable for the time the employee must be away from work because of the injury, as well as make provisions for the payment of medical benefits. Benefit level requirements vary widely among states. The employer is directly responsible for all of these payments, unless the proper insurance protection is provided. Even in states in which an individual operator is not subject to the law, the operator still can be open to a liability suit from the injured employee or others claiming by, through, or under his name. It is strongly recommended that an individual operator with employees purchase these types of coverage.

The standard worker's compensation and employer's liability policy provides protection for individual operators' liability under the law of any state named in the policy, as well as protecting operators from suits brought by employees injured in the employment. This is accomplished by dividing the policy into two types of coverage: worker's compensation coverage and employer's liability coverage.

Worker's compensation coverage will pay all compensation and other benefits required of the insured by the worker's compensation law and any occupational disease law of a state designated in the policy; it does not include any non-occupational disability benefits.

The state or states in which the individual operator operates will be listed specifically in the policy. No limit of liability is purchased for this coverage, because the policy will pay whatever the state law requires regardless of amount.

Employer's liability coverage is designed to protect employers' legal liability resulting from suits instituted by employees for injuries or disease allegedly sustained in the course of employment or related operations. Although the worker's compensation law generally is the exclusive remedy for these injured employees, situations may arise in which a suit may be instituted; employer's liability coverage is available for this reason. A basic limit of liability of \$100,000 per

accident is included in standard rates, but higher limits are available upon request.

In addition, the policy provides for the defense against any suit seeking benefits or alleging injury, even though the suit may be made on false or fraudulent grounds. These benefits are in addition to the benefits payable under worker's compensation coverage or the limit of liability under employer's liability.

If an employer uses contract employees, or even independent contractors, such use should be discussed with the broker and/or insurer. Depending upon state law and whether or not the employee or independent contractor has his or her own coverage, it may be necessary to report payroll and cover them under the workers compensation policy.

A.6. Aviation Insurance Rates

Any type of insurance coverage, whether household, automotive or aircraft, must support itself through a proper balance of premium income that offsets losses and expenses resulting from claims. An insurance company's primary concerns are the cost of losses and the expenses incurred in handling the losses. Once a database containing this information is established, a basic insurance rate per given amount of coverage can be developed. As underwriting results develop, this charge or rate is adjusted as loss experience changes.

In every area of aviation the cost and frequency of accidents or incidents resulting in claims continues to increase. A dented wing tip now can cost thousands of dollars. These increased costs result from the higher costs of labor and parts, the loss of use expense during repair (where covered), more advanced manufacturing methods and use of more sophisticated materials.

Accidents generally fall into two categories:

- Acts of God, such as windstorms, weather phenomena and bird strikes
- Acts of Man, including design deficiency, sub-standard maintenance and pilot error

Eighty-four percent of accidents are caused by Acts of Man.

A.7. How Rates Are Established

A basic hull (the aircraft itself) rate is established by the insurance company for each general type of aircraft, from single engine fixed-gear airplanes through the turbojets.

A.7.1. NEW AIRCRAFT

When a new aircraft is developed and offered to the market, insurance underwriters will evaluate it much as the potential buyer does. They will visit the factory, inspect the aircraft, observe the manufacturing processes, examine the materials and parts used, and (through demonstra-

tion flights) determine handling qualities, performance and systems reliability. They also will review the pilot training program offered, type of FAA certification of the aircraft, complexity of repairs, availability of repair facilities and the general service that may be available to the aircraft operator.

Once the analyses of the aircraft, manufacturing process, service requirements and facilities have been completed, the insurance company will attempt to match the new aircraft with an operational model that is reasonably similar in order to develop the basic minimum rate or insurance charge. A new aircraft – utilizing new raw materials, a new design, and/or new engines – will not have substantial operational experience and will likely bear higher rates than older aircraft with proven reliability.

A.7.2. OLDER AIRCRAFT

As operational experience is gained and historical data is accumulated, insurance rates may go up or down. Contrary to popular belief, experience data is extremely difficult for insurance companies to amass outside of their own company statistics. Because of the competitive nature of the insurance business, one company is not apt to divulge its experience to a competitor and would consider claim experience privileged information for internal use only. In addition, there is no common data bank that reveals the value of all claims paid on a specific aircraft. Therefore, an insurance company must rely heavily on its own experience with a given aircraft, estimate the claim experience of its competitors and evaluate National Transportation Safety Board (NTSB) and FAA accident data on specific aircraft and classes of aircraft.

Although NTSB accident reports indicate the kind of accident (i.e., hard landing, nose wheel collapse, etc.) and damage (i.e., minor, substantial, destroyed) that has occurred, they do not show the dollar amount of the ensuing insurance claim. The insurance company that eventually handles the claim will know precisely what dollar amounts are involved, but it is under no obligation to make this information known to anyone else.

Other factors also influence claim information retrieval. Not all claims stem from operational accidents. For example, an aircraft that was exposed during a windstorm (Act of God) may suffer skin damage resulting in payment of a \$125,000 claim. An aircraft damaged while in the possession of maintenance facility (Act of Man) could be covered by hangar keeper insurance, but the usual procedure for the insurer of the aircraft would be to settle with the owner of the aircraft and negotiate for reimbursement from the insurance company providing the hangar keeper insurance.

A.7.3. GROUP INSURANCE AT LOWER PREMIUM RATES

"If a number of operators of like aircraft joined together, would group aviation insurance be available at lower rates?" NBAA has been asked this question many times and has explored the possibilities.

Most underwriters feel the present system, which involves insuring aircraft at premium rates based on coverage limits, pilot qualifications, aircraft use and how well the individual operator runs its aviation department, provide the best rates available in a competitive insurance market where each underwriter strives to write the best operators.

Group coverage does infer lower premium rates, but group programs usually are standard coverage types to which a fixed rate applies – to all participants. A lack of flexibility is built in if the insured wishes to vary coverage up or down, which would require a rate deviation resulting in a diffusion of the group rate.

The group must accept all applications for coverage from the most marginal to the most professional operators. If the rationale for how rates are established for individual insureds (as explained above) is accepted, the more professional operators could be taxed for the marginal operators.

A.7.4. THE AVIATION INSURANCE UNDERWRITER'S EVALUATION

Insurance companies that specialize in industrial aid or business aircraft insurance are extremely conscious of the many factors required to make up a truly professional corporate aviation department. In the competitive insurance marketplace, companies that operate business aircraft to more exacting and demanding standards are entitled to lower insurance rates since the risk elements are reduced as much as possible.

Consequently, insurance companies may employ underwriters or safety auditors with aviation and flying backgrounds of sufficient depth to perform a comprehensive review of an aviation department in three major areas: management, flight operations and maintenance.

Management – The first point of concern to an underwriter is whether a flight department has established written aviation department policies and procedures. Some underwriters consider incorporating the NBAA Management Guide into the company's aviation operations as an excellent base for the development of a company operations manual.

The complexity of the operations manual will vary depending on the size of the operation. However, for any size aircraft operation, the underwriter does look for an operations manual that covers the following areas, at a minimum:

- Company organization information
- Safety management system, including purpose and responsibilities
- Operating requirements
- Aircraft use, operational control and scheduling
- Department vision, mission and purpose
- Standard operating procedures

- Checklists, normal and emergency procedures
- Qualifications of crew and training requirements
- Aircraft maintenance
- Security
- Emergency response

Flight Operations: Personnel Qualifications –The aviation department manager should have an aviation background or management experience and training combined with an interest in or understanding of business aircraft operations. Depending on the size of the operations, the aviation department manager/chief pilot should be in a supervisory rather than full-time flightcrew position. Professional pilots with airline transport pilot ratings are preferred.

On aircraft requiring a crew of two, it is desirable for both pilots to have an airline transport pilot (ATP) certificate. Commercial and instrument ratings are acceptable for copilots if training and incentives are offered to allow those pilots to upgrade their ratings. FAA licensing regulations require an annual physical examination by a designated FAA medical examiner, but underwriters will check to determine whether the company also requires a physical examination (preferably in the sixth month following the FAA physical) by a company-designated medical examiner.

Depending on the size and complexity of the aircraft operated, underwriters look for captains with a minimum of 3,000 to 4,000 total flight hours, 2,000 hours or more in multi-engine aircraft and 500 hours in turbine-powered aircraft. Copilots need a minimum of 750 to 1,000 flight hours, 250 or more hours in multi-engine aircraft and 100 hours in turbine-powered aircraft. In each case, each pilot will be required to complete recurrent training for the make and model aircraft operated at a facility approved by the underwriter within the preceding 12 months of any flight and prior experience in the type of aircraft to be flown will be important. Based on their evaluation of NTSB and FAA accident history, causal factors, pilot history, training, aircraft complexity, etc., underwriters have determined the incidence of accidents is higher among pilots with low total time and little or no experience in a specific aircraft.

Flight Operations: Aircraft Operating Criteria – Underwriters generally prefer two-person flightcrews over single-pilot operations; they concede this point will have a bearing on the insurance rate offered. In addition to flightcrew, underwriters are concerned with the following items:

- Runway lengths specified in the company operations manual should be sufficient to provide adequate takeoff and landing distance, including adjustments for accelerate/stops distances, wet runways, etc. Accident data available to underwriters indicates a greater number of accidents occur during the takeoff or landing phases of flight, and they look for runway length safety factors that provide adequate stopping distance.

- Underwriters will seek to determine: whether the company policy on takeoff weather minimums is sufficient to allow the aircraft operated to return and land in the event of an emergency; whether landing minimums are equal to or above airline weather minimums as published on approach plates; and whether takeoff and landing minimums are increased for a specified period for pilots with low time in the aircraft.
- Home airport facilities should provide adequate runway lengths, as previously discussed, and should be equipped with modernized runway, boundary, obstruction and – if possible – lead-in, threshold and strobe lighting. An instrument landing system is desirable on at least one runway. Hangar space, parking and ramp facilities, aircraft security, and fire fighting equipment in the building and for airport crash and rescue activities also will be evaluated.
- Crew training will be reviewed carefully. Underwriters believe a continuous, documented crew training program that can be monitored to determine individual pilot progress and currency must be in effect to maintain a satisfactory degree of safety. A ground-school review of both normal and emergency aircraft systems, followed by simulator or aircraft training, should be performed every six months. Pilots should undergo an annual proficiency check flight administered by an FAA designated flight examiner.
- A complete operations manual, approved by the company's executive management, that establishes operating standards and parameters that exceed FAA, air carrier, or industry criteria. (The higher the standards, the safer the operation is assumed to be.)
- Highly qualified and motivated personnel who accept and operate according to set standards.
- A continuous, organized and documented training program to attain and maintain optimum pilot and maintenance proficiency.
- An effective maintenance program that will ensure a safe, airworthy and problem-free aircraft for company use.

A.7.5 THE MARKET CYCLE

Finally, in addition to the underwriter's evaluation of all these factors, is the overall group of insurance companies that insure aircraft, and the reinsurance companies behind them. Based on world conditions, catastrophic losses, insurance company failures and competition from new entrants, insurance companies will have to raise or lower rates to ensure a profit or keep desirable business. A knowledgeable agent or broker is key to understanding these dynamics and using them to make an informed choice.

Flight Operations: Aircraft Evaluation – The aircraft make and model and the prior safety record are reviewed using accident data that allows for the development of a potential rate of accidents for each model of aircraft – jet, turboprop, or piston engine. In addition, the specific aircraft's overall condition, airframe and engine times, instrumentation, avionics, safety equipment, checklists, passenger emergency briefing procedures, and security will be assessed. Companies that own multiple aircraft will be given due credit if the equipment is standardized.

Maintenance – The company's maintenance program will be reviewed based on aircraft maintenance records, compliance with factory service bulletins and FAA airworthiness directives, and response to pilot "squawks" on mechanical problems. Maintenance may be performed by either an outside FAA-approved repair station or by the company's maintenance personnel in-house. In some cases, a company's maintenance department may be authorized as an FAA repair station. If maintenance is performed by an outside facility, the underwriter will review that facility's experience and qualifications. If the maintenance is performed in-house, the underwriter will review the qualifications and experience of personnel and the technical support available to maintain the aircraft satisfactorily.

Summary – According to underwriters, the following are the key points in determining whether a given operation is entitled to consideration for insurance coverage at a preferred premium rate:

APPENDIX B: AIRCRAFT FEASIBILITY STUDY

The decision to purchase a company aircraft should be the result of an intensive and comprehensive evaluation of the company's travel needs. Some companies may have the in-house talent to do the evaluation process; others may find it advisable to employ aircraft acquisition consultants experienced in evaluation and laying the groundwork to establish or augment the aviation department. A limited number of aviation consultants are available, and their findings should be objective and in the company's best interest. NBAA can furnish names of consultants, without recommendation, upon request.

The first step in an evaluation is an analysis of the potential uses of the company aircraft, which may include one or all of the following:

- Transport the top executive
- Transport other company executives
- Transport other management personnel
- Transport the labor force
- Transport cargo
- Transport executives of customer companies

In any case, the company must consider all its potential needs to ensure maximum utilization of company aircraft.

The second step is a comprehensive examination of the following factors.

- Amount of railroad travel used and cost and time involved
- Amount of automobile travel used and cost and time involved
- Amount of airline travel used and cost and time involved
- Frequency of travel requirements
- Distance of trips taken
- Number of repeat trips to the same locations
- Length of time at visited locations
- Availability of convenient airline flights and how close to the final destination they land
- Travel time to and from airports
- Number and type of personnel making the trip
- Airport availability and facilities

Occasionally, company records that provide answers to many of these questions may be available. In other cases, it will be necessary to prepare a special form on which

company personnel can record specific information over a representative period of time. The data accumulated can then be tabulated and calculations that realistically reflect the company's requirements can be made.

Consideration also should be given to anticipated needs for forecasting purposes. Current needs may overlook the fact that personnel may have canceled or delayed trips that could have been made conveniently if a company aircraft had been available. For instance, other modes of transportation may have injected time factors that were unacceptable when measured in terms of value to the company. In order to measure a company's unsatisfied travel requirements, a "need-to-travel" questionnaire should be developed to show not only how much traveling a company does, but also what it really needs to do and could do if it had a business aircraft. That form should be tailored to a specific company's conditions and should include the following items:

- Name of authorizing individual
- Trip data
- Number of personnel involved
- Travel time required (include all time required from departure point to destination point by all modes of transportation, i.e., auto, taxi, airline, etc.)
- Duration of stay
- Unusual requirements

The evaluation of how an executive's time may be used suggests that data should be collected on:

- Importance of the trip
- How the requirements can be fulfilled
- Degree of satisfaction with alternate arrangements
- Measurement of any potential savings from using a company aircraft

This data then can be assessed so that the executive level can decide whether or not the company should go ahead with the purchase of an aircraft.

An important consideration is whether purchasing a new aircraft (as opposed to purchasing a fractional share of an aircraft or using charter) will best fulfill the company's travel needs. Often the best solution is a "blended approach" involving a mix of commercial, charter, fractional and whole aircraft usage. If charter or fractional solutions are to be implemented, a completely separate analysis of different fractional programs and charter providers will be necessary.

B.1. Choosing a New Aircraft

In this context, "new" aircraft means aircraft not currently owned by the company. New aircraft can be either fresh-from-the-factory or used aircraft, and can be the company's first purchase or additional aircraft.

It also is assumed that the decision to purchase is based on a detailed, comprehensive evaluation of the company's travel requirements and current financial position, and consideration of the intangible benefits gained through aircraft ownership. If that evaluation has not been fully completed or if it has provided only partial justification for ownership, the decision to buy should be postponed until all factors have been considered.

Having reached a decision to buy, the choice of the aircraft that will best fill the company's needs also should be the result of a detailed and comprehensive evaluation of aircraft capability. The rule of thumb most commonly used is that the aircraft should be no more than what is needed to satisfy most of the company's requirements. Purchasing an aircraft with excessive range, speed, or capability can lead to lower use or higher costs, either of which could affect long-term ownership. The answer to the question, "What do we want the aircraft to do for the company?" should determine what aircraft is purchased.

Aviation department managers' or chief pilots' knowledge of aircraft capability and characteristics should be drawn upon in this analysis. Many types and models of aircraft are available, but it is possible to narrow the broad field down into manageable proportions by considering fundamental requirements.

The following discussion will cover most of the points that should be considered; other factors which the company believes are germane to its circumstances also should be considered.

B.1.1. COST FACTORS

The initial purchase cost of the basic aircraft, instrumentation, avionics and interior is a primary cost consideration. Most manufacturers offer a range of options, which often can run into millions of dollars. For used aircraft, modification, maintenance and cosmetic improvements to the aircraft instrumentation, avionics, interior and exterior may be necessary or advisable. Of almost equal importance is the annual operating cost of the aircraft.

For this capital expenditure, NBAA recommends setting a dollar cost range that the company feels it can absorb comfortably. The company's financial advisors should consider how a cash purchase, financing, or a lease/purchase agreement will affect initial and subsequent costs. The company also may want to look ahead to the disposition value of the aircraft, should its requirements change; tracing sales patterns and dollar re-sale values historically can be relatively simple. The maximum figure in the cost range will affect the type, model, size, and speed of aircraft that may be considered.

An analysis of estimated annual aircraft operating costs should be an integral part of the overall cost evaluation. Consider factors such as fuel, maintenance, hangar, travel expenses, miscellaneous fees, salaries, fringe benefits,

pilot and/or maintenance technician training, depreciation and insurance. Operating costs will vary depending on geographical location and travel patterns. Estimates should reflect any peculiarities in the company's operation.

This analysis of operating costs may have a bearing on initial purchase costs, and the combined cost should be comfortably within the company's concept of total ownership costs. Because a number of aircraft are acquired through financing or lease agreements, those costs may appear in the operating budget and should be recognized as such. Purchase of the aircraft and its acceptance as a valuable asset to the company should be viewed in much the same light as the major expenditure of capital for any tool, machine or instrument that will improve the company's productivity.

In addition to capital and operating costs, the company should evaluate the tax impact of aircraft ownership and operation. This includes an analysis of tax depreciation (and depreciation recapture); the deductibility of operating costs for tax purposes; sales, use and property taxes; and federal excise taxes.

B.1.2. AIRCRAFT CHARACTERISTIC FACTORS

Within the initial and operating cost range, anticipated operational requirements such as type, size, speed, range, and airport runway lengths will influence the purchase.

Because most business aircraft are used for passenger travel, seating is a primary consideration. The evaluation of company needs should indicate an average number of passengers expected for each flight; that figure is basic to the size of aircraft to be considered.

The operating costs of an aircraft are influenced by the size, speed and age of the aircraft. Increased speed will be reflected in increased initial costs. Unless the company has substantial long-range travel requirements, speed may be sacrificed in exchange for seating capacity, short field capability, lower purchase cost, and other operational factors. Common terms used to describe speed are normal cruise, long-range cruise, and maximum cruise. These terms are subject to various interpretations and factors such as zero fuel weight, payload, and altitude, and they emphasize the necessity for considerable performance analysis to be made so that aircraft speeds can be compared equitably. Cruise speeds are critical to cost calculations and block speed determinations, and should be carefully determined.

The useful range of the aircraft to be selected depends on the most anticipated routes of flight and is affected by payload and speed. As with speed, terminology may vary. A standard instrument flight profile was established in the Jet Range Format for a given stage length, and manufacturers were asked to insert data on weight, time enroute, fuel consumed, etc. Subsequently, other range formats were developed for turboprop airplanes and helicopters.

Airport and runway lengths are a very important consideration if routes of flight are to communities with smaller airports. As elementary as this factor sounds – the aircraft must be able to operate into and out of a specific airport – operating capability with a useful payload is sometimes overlooked. Airports that are a frequent destination also should be considered. If frequent travel to cold climates is expected, snow and ice will bear on operational factors.

The annual edition of the *Business and Commercial Aviation Planning and Purchasing Handbook* provides detailed descriptions of available aircraft.

B.1.3. SAFETY FACTORS

The overall safety record of business aircraft operations is exceptionally good and reflects the professionalism of business aviation pilots and maintenance technicians as well as the design characteristics of the aircraft. Major safety factors are:

- Reliability
- Maintainability
- Compatibility
- Flight characteristics

Reliability – New aircraft introduced to the market are subject to exhaustive testing by manufacturers and must meet certification requirements laid down by the FAA. As the use of a particular aircraft model increases, a considerable amount of knowledge about its relative overall reliability is collected. NBAA's Technical Committee is composed of Members who own and operate a specific aircraft and are willing to exchange information about the performance of the aircraft and its components with Members. In conjunction with its Annual Meeting & Convention, NBAA schedules a series of Maintenance & Operations Sessions for various aircraft, chaired by members of the Technical Committee, that bring airframe and component parts manufacturers and users together for open discussions. These activities can provide insight into the reliability of a specific aircraft.

Maintainability – As aircraft and equipment become more complex, consideration should be given to where and how the aircraft is to be maintained. The judgment about whether an aircraft is to be maintained in whole or in part by company personnel or through outside service organizations results from an evaluation of cost factors related to servicing, testing, removing, overhauling, or replacing components. The maintenance labor hours and equipment costs required per flight hour should be carefully evaluated, but precise figures may be very difficult to obtain. Manufacturers can provide estimates, but these cannot be verified until the aircraft is acquired and the maintenance requirements begin. Surveying experienced operators of similar aircraft may help, but because of the diverse maintenance methods used, line-by-line comparisons are useful

only if the companies have similar philosophies for aircraft maintenance and use equally similar maintenance methods. One consideration in maintainability is design maturity. New state-of-the-art aircraft and equipment may have advantages, but also may experience an unusual failure rate until the "bugs" have been worked out of the design. Another aircraft in its prime may not be the latest design, but it may be well-supported and have low failure rates; conversely, equipment may be obsolete and have inadequate support. These factors also should be considered in the selection process.

Compatibility – If the company is contemplating purchasing more than one aircraft, or adding aircraft to its existing fleet, the selection of the aircraft should take into consideration other aircraft being operated or to be operated. Sticking with one product line can offer substantial advantages in familiarity with systems, parts inventory and personnel skills. However, if the company's travel requirements are so diverse that one product line cannot offer all the capabilities that are needed, compatibility should be compromised so that the company needs are met.

Flying Characteristics – With all due consideration for aircraft type, size, and speed, other factors – rate of climb, stability and control, stall reaction, slow and high speed response, landing and takeoff speeds, and other aerodynamic characteristics – are measures of safety. Many aviation publications, as part of their readership services, publish detailed aircraft flight evaluations using self-devised performance criteria. Because the human element is involved, the opinions from even the most experienced pilots about the "feel" of the aircraft may differ.

However, the performance and capability of the aircraft must relate to where and how it will operate, and those factors should be the basis for evaluating the aircraft. An operational limitation or restriction affecting the performance of an aircraft could impose unsuspected handicaps, particularly if those limitations or restrictions are imposed by federal rules.

Passenger comfort in flight cannot be overlooked or underestimated, for if company executives do not feel as much at ease as the pilot, the aircraft is likely to be a short-term proposition.

The chief pilot is an indispensable ingredient in this phase of the evaluation. However, the chief pilot must remember that more than the cockpit environment is involved. It may be helpful to tabulate not only what each aircraft will do but what it cannot do.

B.1.4. ENVIRONMENTAL FACTORS

The issue of aircraft noise will be one of the greatest constraints in the further development of the aviation system.

A growing trend among local airport authorities has been to increase restrictions on aircraft operations; this threatens to

limit the construction and expansion of airports as well as airport access.

This and other environmental issues will make aircraft noise levels an important consideration when choosing an aircraft for future operations. Companies planning to purchase aircraft should take a careful look at the airports they intend to use to see if particular noise levels have been established.

FAR Part 36 provides noise standards for aircraft and series 36 advisory circulars provide noise data for specific aircraft. The Business and Commercial Aviation Planning and Purchasing Handbook contains the basic elements of these limits. Further information on aircraft noise is found in Section 1 of this guide.

B.1.5. THE FINAL STEP

All of the steps enumerated should be itemized and summarized with reasonable supporting data. Any compromise to a "perfect" solution must be stated.

The primary sub-steps to the final steps should be:

- A tabulation of the analysis factors with appropriate summary data;
- An evaluation of those factors;
- A final judgment based on the evaluation, and
- Documentation of the evaluations, judgments, and decisions.

If the selection factors have been thoroughly identified and analyzed, the subsequent steps should fall into place.

For example, manufacturer's specifications should be impartially analyzed against similar frames of reference; in the absence of specified standards, those may have to be developed. The exact meaning of terms applied to cruise speeds, range, runway length requirements, fuel reserves, altitudes, payloads, etc., should be clarified.

A summarized tabulation showing selection factors for each aircraft can take many forms, but it should include all items of value to the analysis, arranged under appropriate group headings. This tabulation should be referred to in the final judgment.

The product should be a comprehensive and factual set of data that will provide a measure of the degree of difference between various aircraft under consideration. The figures may be in dollars, miles per hour, feet, or units. There will, undoubtedly, be significant differences between a few factors which will point to the most desirable aircraft.

APPENDIX C: SUPPLEMENTAL LIFT

There are times when a company's own aircraft will be down for maintenance, is flying other scheduled trips or is impractical for a given trip's requirements. During these times, it is likely that a company still has a need for business aviation to transport people or property because of the flexibility it provides. In these cases, supplemental lift can fill the gap to cover the transportation. This appendix provides an overview of supplemental lift options, including:

- Aircraft charter
- Block charter and jet-card programs
- Fractional ownership
- Interchange agreements

C.1. Aircraft Charter

Charter operators fly when and where a company wants to go, and can meet a company's particular preferences or needs.

Generally, with a few exceptions, a person or company providing air transportation of persons or property for compensation or hire must become certificated as an operator under Part 119 of the Federal Aviation Regulations (FARs). Once certificated under Part 119, the charter operator flies under strict regulations (like those found in Part 135 or Part 121 of the FARs) that dictate operational requirements. After being certificated, these charter operators may advertise that they provide transportation for hire. The FAA considers an operator advertising to the public as one that "holds itself out" to a segment of the public, as one that is willing to furnish transportation within the limits of its facilities to any person who wants it.

What does this mean? Since the FAA recognizes that air charter operators have a responsibility to provide air transportation with the highest degree of safety possible, it has a certification process that is designed to ensure that certificate holders understand and, more importantly, fulfill this duty.

Not just anyone can buy an airplane and start charging people to fly them from point A to point B. Charter operators undergo a lengthy certification process, which can take several years. The FAA approves the company leadership and the operating manuals, oversees the training programs and issues operation specifications that regulate the charter operator. The FARs also address crew rest and physical examinations, and mandate a stringent anti-drug program for operators. The FAA closely monitors charter operators to make sure that they conform to the established standards of performance.

A charter flight usually costs a flat rate per hour. If a reposition flight is required to get the aircraft to a location, it may be an additional cost. Depending on operator and type of trip, other additional fees might also be charged, such as:

- Wait time on the ground
- Hotel accommodations and meal expenses should the crew need to overnight
- Catering
- International fees for Customs or Inspections
- Fuel surcharges
- Landing fees
- Ramp fees

Commercial air transportation charges are subject to federal excise taxes.

OPERATIONAL CONTROL

The FAA defines operational control in the following way: "'Operational control,' with respect to a flight, means the exercise of authority over initiating, conducting or terminating a flight."

Aircraft owners flying aboard aircraft they own or lease exercise full control over and bear full responsibility for the airworthiness and operation of their aircraft. Under these circumstances, the FAA has determined that the appropriate level of oversight is provided by the regulations in Part 91, which generally are less stringent than those of Part 135. In this case, the owner has operational control and is fully responsible.

Passengers on a charter flight have surrendered operational control to the operator. Passengers may tell the operator when and where to go, but they exercise no control over and bear no responsibility for the airworthiness or operation of the aircraft on which they fly.

The charter operator exercises control of the operation and bears responsibility for compliance with the regulations. Because the charter operator is a commercial enterprise in the business of air transportation to the public, the FAA imposes on the air carrier stringent regulations and oversight under Part 135.

FINDING AND EVALUATING A CHARTER OPERATOR

NBAA publishes an *Aircraft Charter Consumer Guide* to assist companies seeking a supplemental lift option. Included in the guide is an overview of regulatory requirements and consumer considerations, pre-screening questions consumers should ask and a standard request for proposals (RFP) form for use in obtaining charter quotes for specific flights.

NBAA's *Aircraft Charter Consumer Guide* addresses:

- Determining the mission of the charter flight
- The role of air charter brokers
- How to find an air charter operator
- Selecting a charter operator
 - Safety and security
 - Operational considerations
 - Knowing the charter operator
 - Insurance requirements and recommendations
 - Price considerations

BLOCK CHARTER AND JET CARDS

Both charter operators and fractional ownership programs have offered customers the ability to purchase block charter packages. These block charter programs recently have been marketed as "jet cards" or "fleet membership programs." These programs may be a viable solution for operators who need to charter an aircraft often and want to have an airplane (or fleet of aircraft) available but don't want to participate in a fractional program, because it does not make sense from their mission profile or financial perspective.

These programs allow customers to purchase a defined number of flight hours. The customer has a finite number of hours available to them that gets reduced every time they use their "card." Flight time is typically sold in 25 hour and 50 hour blocks. Flights are flown under the appropriate air carrier FARs, which for business aircraft is typically FAR Part 135.

C.2. Fractional Ownership

Fractional ownership programs offer shared aircraft ownership and provide for the management of the aircraft by an aircraft management company. Aircraft owners participating in the program agree to share their aircraft with others having an ownership interest in the aircraft, as well as to lease their aircraft, through a dry lease exchange program, to other owners in the fractional program who do not have an interest in that specific aircraft. The aircraft owners use the common management company to maintain the aircraft and administer the leasing of the aircraft among the owners.

On September 17, 2004, the FAA's final rule "Regulation of Fractional Aircraft Ownership Programs and On-Demand Operations" was published. This rule established a new Subpart K in Part 91 to cover fractional ownership operations. The new Subpart K clarifies what qualifies as a fractional ownership program, clarifies who has operational control, defines operational control responsibilities, codifies many of the "best practices" now being used voluntarily in

fractional ownership programs and incorporates many of the safety standards of Part 135.

In brief, Subpart K accomplishes the following:

- It establishes the criteria for qualifying as a fractional ownership program.
- It establishes that fractional owners and the management company share operational control of the aircraft and delineates operational control responsibilities.
- It establishes regulatory safety standards for operations under fractional ownership programs, including management operations, maintenance, training, crewmember flight and duty requirements, and others.

WHAT IS A FRACTIONAL OWNERSHIP PROGRAM?

A fractional ownership program means any system of aircraft ownership and exchange that consists of all of the following elements:

- The provision for fractional ownership program management services by a single fractional ownership program manager on behalf of the fractional owners
- Two or more airworthy aircraft
- One or more fractional owners per program aircraft, with at least one program aircraft having more than one owner
- Possession of at least a minimum fractional ownership interest in one or more program aircraft by each fractional owner
- A dry-lease aircraft exchange arrangement among all of the fractional owners
- Multi-year program agreements covering the fractional ownership, fractional ownership program management services and dry-lease aircraft exchange aspects of the program

Fractional owners buy a part, or share, of an aircraft. A share is contractually defined and allows an undivided interest of a single aircraft to be sold to multiple owners. Most owners purchase one-quarter of an aircraft, though regulations allow a fractional ownership interest of as little as one sixteenth.

Typical contract terms for fractional programs are five years. Participating in a fractional program will require companies to sign a multi-year program agreement, and, in addition to several other documents, a dry lease aircraft exchange agreement and a purchase agreement.

Though a fractional owner has purchased an aircraft, it may not necessarily be flying on that specific airplane. An appealing aspect of the fractional programs is that they usually are able to provide an aircraft within four hours of when

requested. If a specific airplane is not available, the aircraft provided will be virtually identical to the one owned.

In addition to the initial acquisition cost, fractional owners will pay a monthly management fee and an occupied hourly fee for each hour flown. The monthly management fee and the occupied hourly fee generally are adjusted annually based on the Consumer Price Index. Additionally, owners may pay a fuel variable and certain charges are subject to federal excise tax. Additional fees may be applied when traveling outside the continental United States. Fractional providers often include stock items for catering but will charge extra for nonstandard or custom requests.

OPERATIONAL CONTROL

Subpart K of Part 91 regulates who has operational control in a fractional program.

When the aircraft is operated under Part 91, Subpart K, each owner in operational control of a program flight is ultimately responsible for safe operations and for complying with all applicable requirements of the aviation regulations, including those related to airworthiness and operations in connection with the flight. Each owner may delegate some or all of the performance of the tasks associated with carrying out this responsibility to the program manager, and may rely on the program manager for aviation expertise and program management services.

When the owner delegates performance of tasks to the program manager or relies on the program manager's expertise, the owner and the program manager are jointly and individually responsible for compliance.

An owner is in operational control of a program flight when the owner:

- Has the rights and is subject to the limitations set forth in regulations under Subpart K of Part 91
- Has directed that a program aircraft carry passengers or property designated by that owner
- The aircraft is carrying those passengers or property

An owner is not in operational control of a flight in the following circumstances:

- A program aircraft is used for a flight for administrative purposes such as demonstration, positioning, ferrying, maintenance or crew training, and no passengers or property designated by such owner are being carried.
- The aircraft being used for the flight is being operated under Part 121 or 135 of the FARs.

Fractional aircraft programs that also have an Part 135 air carrier certificate may allow owners to elect for their flights to be operated by the fractional program under Part 135. In

such cases, the fractional program has operational control and the fractional share owner is no longer responsible for safe operations and for complying with all applicable requirements of the aviation regulations.

C.3. Interchange Agreements

Interchange agreements allow two aircraft-owning persons to exchange use of their aircraft. The exchange must be made on an hour-for-hour basis. However, if there are dissimilarities in aircraft types and use that could cause a cost differential, the difference in cost can be made up with limited compensation.

For example, if an operator of Aircraft A entered into an interchange agreement with an operator of the superior Aircraft B, the Aircraft A operator could use Aircraft B for a specified number of hours. The Aircraft B operator would be permitted to use Aircraft A for the same number of hours. However, the Aircraft A operator would be permitted to pay the difference between the costs of owning, operating and maintaining Aircraft A and Aircraft B, since Aircraft B costs more to own, operate and maintain than Aircraft A. It is not acceptable for the Aircraft B operator to fly two hours in Aircraft A for every one hour that the Aircraft A owner flies in Aircraft B to make up the differential.

The number of hours, costs of owning, operating and maintaining, and duration of the agreement should be agreed upon in advance and stated in the lease.

Interchange agreements are defined in Subpart F of Part 91 and are permitted between Part 91 operators. These agreements are one limited exception to the FAA restriction that prohibits Part 91 operators from accepting compensation for flights. Subpart F applies only to airplanes that are:

- U.S.-registered and
- Large (greater than 12,500 lbs. maximum certificated takeoff weight), or
- Turbojet-powered (not turboprop or piston-powered) and
- Multiengine (at least two engines), or
- Fractional aircraft (regardless of size)

Other U.S.-registered aircraft that do not meet these criteria may apply for an exemption to these regulations or take advantage of NBAA's Small Aircraft Exemption, for which more information is available on the NBAA web site at www.nbaa.org/exemption.

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APPENDIX D: NBAA RANGE FORMATS

In 1965, NBAA began to compile data on various corporate aircraft; the resulting data was the Jet Range Format. This format and the formats for turboprop airplanes and helicopters are provided in this section. The *Business and Commercial Aviation Planning and Purchasing Handbook* uses the NBAA Range Format in depicting aircraft performance.

The intent of the Range Format was to provide a standard for prospective aircraft purchasers to use in comparing the performance of various aircraft.

The format now includes:

- An aircraft's maximum range
- Performance for a 300 nautical mile trip
- Performance for a 600 nautical mile trip
- Performance for a 1,500 nautical mile trip

Operators must remember that the Range Format is not an operational recommendation on how to plan a flight, but a template used for comparing performance.

Each profile describes a trip on a "real-life" basis. For example, trips include a missed approach and a flight to an alternate airport. The origin-to-destination segment may use up to three step climbs to higher altitudes, at the manufacturer's discretion. All altitudes and speeds for origin to destination are the optimum for the aircraft involved. The optimum altitude and best fuel speed are used for the destination to alternate stage.

For flight stages in which the performance is difficult to measure, some conditions are assumed. For example, a standard instrument approach is considered to be equivalent to the fuel required to fly at 5,000 feet mean sea level (MSL) for 5 minutes. All taxiing is presumed to be done at idle for 10 minutes (for operations under instrument flight rules (IFR) and visual flight rules (VFR)).

Many aircraft manufacturers state in their advertising that an aircraft has an NBAA IFR/VFR fuel reserve of a certain number of pounds. The NBAA IFR Reserves is defined as the route of flight in the profile that begins at the "K-L" leg and goes through to the end of the flight profile. This is where the aircraft begins its missed approach to divert to an alternate.



INSTRUCTION SHEET FOR NBAA FIXED-WING AIRCRAFT RANGE FORMAT

The instructions on the format should provide all information needed to fill in the blanks. In addition, the following comments may be useful.

Speeds calculated from C to J should not include the 10 minutes allowed for taxi (A–B) and the one minute allowed for takeoff (B–C). Subtract this 11 minutes from the total time for speed calculation.

The average rate of climb and TAS during climb segments may be the same for VFR and IFR but could vary when different cruise levels for each are selected.

Please fill out the format for the following trips:

- Maximum range IFR and VFR
- 300 NM IFR only
- 600 NM IFR only
- 1,500 NM IFR only (if maximum IFR range exceeds 2,000 NM)

For trips other than maximum range, the initial fuel should only be that required for the trip. The alternate and the reserve should be as called for on the format. The payload carried should not exceed about 200 pounds for each passenger and luggage for the maximum number of passenger seats provided in the airplane. Takeoff weight for these trips will naturally be well under maximum and the runway requirements for takeoff also will be less.

For all calculations, use no wind and standard atmospheric conditions. Note the time to the alternate for the aircraft includes a five minute loiter at 5,000 feet for clearance. This is included in the total time to alternate following the missed approach.

Although the airplane operation manual may not provide landing runway lengths required for transport operation, the 40 percent additional runway length for destination and 30 percent for alternate are the figures to be used on the format. All runway lengths called for on the format are for the airplane gross weights at the time of runway use, at sea level, zero wind and standard temperature.

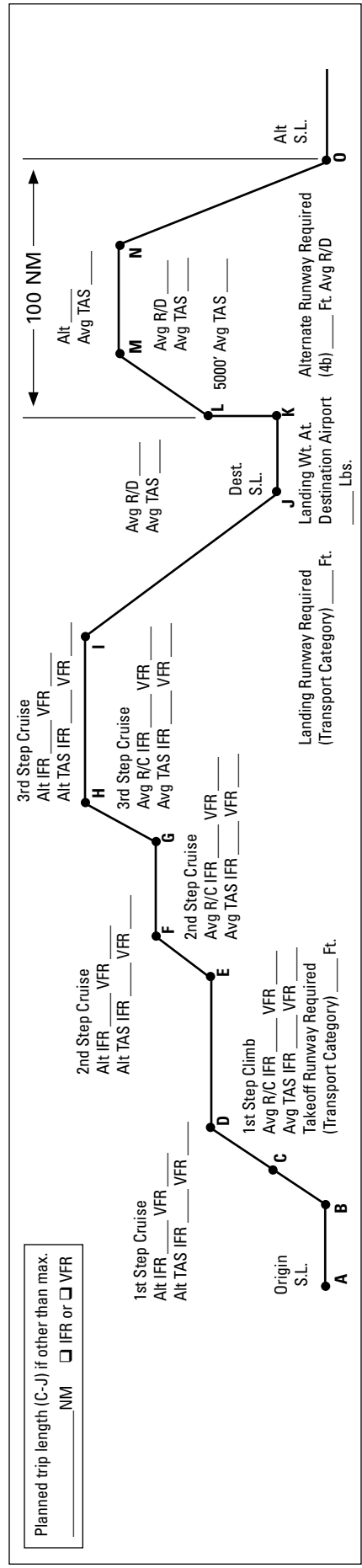
Aircraft basic operating weight should be calculated from the empty weight of an actual airplane (when available) having an executive interior, full electronic equipment plus galley equipment and supplies. Show "N" number when applicable.

NBAA TURBOPROP AIRCRAFT RANGE FORMAT

Conditions: Origin, destination and alternate are S.L., Entire I.S.A. and zero wind. Maximum of three cruising levels permitted. Speed in knots and miles are nautical. VFR segment A to J. Fuel reserve after landing, 30 min., loiter at 5,000 feet. IFR segment A to O. Fuel reserve after landing at alternate should meet IFR or VFR minimums as appropriate for loitering at 5,000 feet. Rate of descent limited to 3,000 FPM, Fuel wt. 6.7 lbs. per U.S. gallon. / **Configuration:** Dispatch at maximum ramp weight provided max. T.O. wt. not exceeded. All fuel tanks at capacity. Max. zero fuel wt. not exceeded. Basic operating wt. to include executive interior, crew and full equipment. If format used for other than max. range, provide fuel to meet above reserves and show runway lengths (Part 25, old 4b, Air Carrier Reg. 121 and SR 422b) for weights involved.

Type Aircraft
Type Engines
Prepared by
<input type="checkbox"/> Data verified by flight Date
<input type="checkbox"/> Data not verified by flight
Checked by

Segment	Flight Segment	Segment Time		Total Time		Total Weight Lbs.	Initial Fuel Lbs.	Max. Ramp Weight Lbs.	Max. Zero Fuel Weight Lbs.	Max. T/O Weight Lbs.
		VFR	IFR	VFR	IFR					
A-B	Taxi. All engines idle.	0:10	0:10	0:10	0:10					
B-C	Takeoff. Full power.	0:01	0:01	0:11	0:11					XX
C-D	Optimum R/C enroute to 1st step cruise.									XX
D-E	Normal cruise power, 1st step cruise.									
E-F	Optimum R/C enroute to 2nd step cruise.									
F-G	Normal cruise power, 2nd step cruise.									
G-H	Optimum R/C enroute to 3rd step cruise.									
H-I	Normal cruise power, 3rd step cruise.									
I-J	Descend enroute to S.L., 3000 fpm max. (VFR land)									
J-K	Std. Inst. app. Fuel equal to loiter at 5000.	XX	0:05	XX	XX					XX
K-L	Optimum R/C to 5000' after missed approach.	XX		XX	XX					XX
L-M	Hold at loiter power at 5000' for clearance.	XX	0:05	XX	XX					XX
M-N	Optimum R/C enroute to optimum cruise altitude.	XX		XX	XX					XX
N-O	Economy cruise.	XX		XX	XX					XX
	Descend enroute to S.L. 3000 fpm max. and land.	XX		XX	XX					XX
										Total
										NM
										kts.
										NM
										kts.

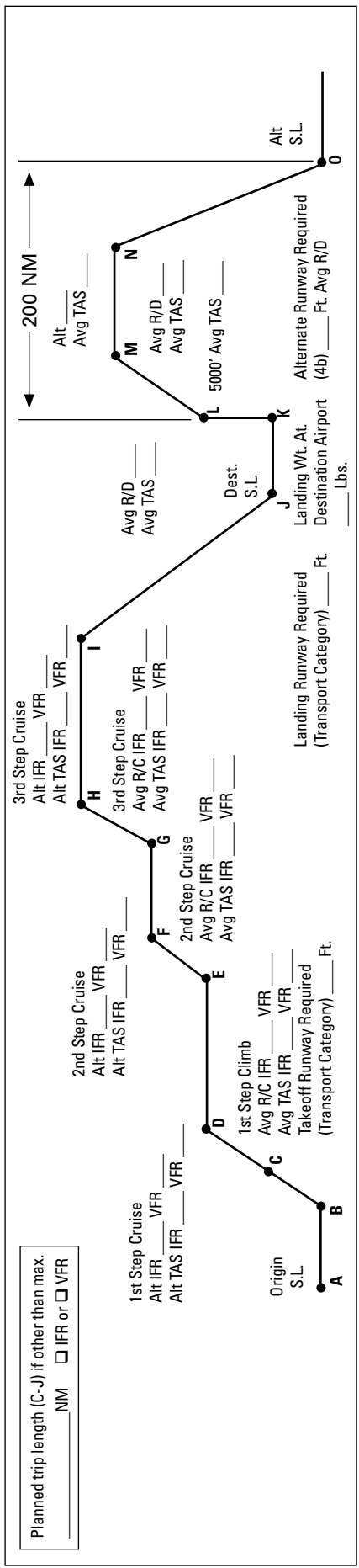


NBAA JET AIRCRAFT RANGE FORMAT

Conditions: Origin, destination and alternate are S.L., Entire I.S.A. and zero wind. Maximum of three cruising levels permitted. Speed in knots and miles are nautical. VFR segment A to J. Fuel reserve after landing, 30 min., loiter at 5,000 feet. IFR segment A to O. Fuel reserve after landing at alternate should meet IFR or VFR minimums as appropriate for loitering at 5,000 feet. Rate of descent limited to 3,000 FPM, Fuel wt. 6.7 lbs. per U.S. gallon. / **Configuration:** Dispatch at maximum ramp weight provided max. T.O. wt. not exceeded. All fuel tanks at capacity. Max. zero fuel wt. not exceeded. Basic operating wt. to include executive interior, crew and full equipment. If format used for other than max. range, provide fuel to meet above reserves and show runway lengths (Part 25, old 4b, Air Carrier Reg. 121 and SR 422b) for weights involved.

Type Aircraft
Type Engines
Prepared by
<input type="checkbox"/> Data verified by flight Date <input type="checkbox"/> Data not verified by flight Date
Checked by

Segment	Flight Segment	Initial Fuel		Total Weight		Max. Ramp Weight		Max. Zero Fuel Weight		Max. T/O Weight	
		Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
A-B	Taxi. All engines idle.	VFR	IFR	VFR	IFR	VFR	IFR	VFR	IFR	VFR	IFR
B-C	Takeoff. Full power.	0:10	0:10	0:10	0:10	0:10	0:10	0:10	0:10	XX	XX
C-D	Optimum R/C enroute to 1st step cruise.	0:01	0:01	0:01	0:11	0:11	0:11			XX	XX
D-E	Normal cruise power, 1st step cruise.										
E-F	Optimum R/C enroute to 2nd step cruise.										
F-G	Normal cruise power, 2nd step cruise.										
G-H	Optimum R/C enroute to 3rd step cruise.										
H-I	Normal cruise power, 3rd step cruise.										
I-J	Descend enroute to S.L., 3000 fpm max. (VFR land)										
J-K	Std. Inst. app. Fuel equal to loiter at 5000.	XX	0:05	XX	XX	XX	XX	XX	XX	XX	XX
K-L	Optimum R/C to 5000' after missed approach.	XX		XX	XX	XX	XX	XX	XX	XX	XX
L-M	Hold at loiter power at 5000' for clearance.	XX	0:05	XX	XX	XX	XX	XX	XX	XX	XX
M-N	Optimum R/C enroute to optimum cruise altitude.	XX		XX	XX	XX	XX	XX	XX	XX	XX
N-O	Economy cruise.	XX		XX	XX	XX	XX	XX	XX	XX	XX
	Descend enroute to S.L. 3000 fpm max. and land.	XX		XX	XX	XX	XX	XX	XX	XX	XX
Total distance and avg. speed to destination VFR (C to J)		NM		kts.		Total					
Total distance and avg. speed to destination IFR (C to J)		NM		kts.							





INSTRUCTION SHEET FOR NBAA ROTARY AIRCRAFT RANGE FORMAT

The instructions on the format should provide all information needed to fill in the blanks. In addition, the following comments may be useful.

Speeds calculated from B to E should not include the five minutes allowed for start and condition checks (A–B). Subtract this five minutes from the total time for speed calculation.

The average rate of climb and TAS during climb segments may be the same for VFR and IFR but could vary when different cruise levels for each are selected.

Please fill out the format for the following trips:

- Maximum range IFR and VFR altitude is required
- 50 NM range IFR and VFR at 3,000 feet altitude
- 125 NM range IFR and VFR at 5,000 feet altitude
- 200 NM range IFR and VFR at 10,000 feet altitude

For trips other than maximum range, the initial fuel should only be that required for the trip. The alternate and the reserve should be as called for on the format. The payload carried should not exceed about 200 pounds for each passenger and luggage for the maximum number of passenger seats provided in the helicopter.

Aircraft basic operating weight should be calculated from the empty weight of an actual helicopter (when available) having an executive interior and appropriate flight and electronic equipment.

NBAA HELICOPTER RANGE FORMAT

Conditions: Origin, destination and alternate are MSL. Entire flight I.S.A. and zero wind. Speed in knots and miles are nautical. VFR segment A to E. Fuel reserve after landing, 30 minutes, loiter at 1000 feet. Rate of descent limited to 1000 FPM. Fuel weight 6.7 lbs. per U.S. gallon.

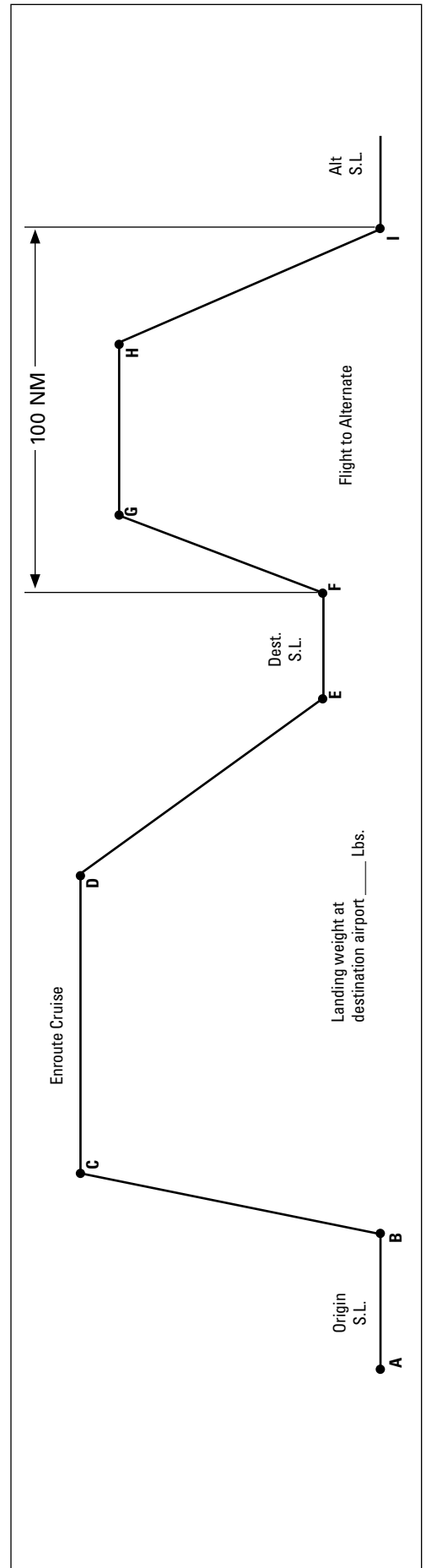
Configuration: Dispatch up to maximum ramp weight provided maximum T/O weight not exceeded. Fuel as required (ECU operating) except maximum range mission where all tanks full. Basic operating weight to include executive interior, crew and full equipment (FARs Part 27 and 29 for reference). NOTE: If alternate distance of 100 NM (F to I) is not appropriate, please indicate mileage figure used for alternate.

Type Aircraft	
Type Engines	
Prepared by	
<input type="checkbox"/> Data verified by flight Date	<input type="checkbox"/> Data not verified by flight Date
Checked by	

Basic Operating Weight	Mission Payload	Initial Fuel	Cruise Altitude (ft.)	Cruise TAS (kts.)
_____ Lbs.	_____ Lbs.	_____ Lbs.	_____	_____

Segment	Flight Segment	Segment Time		Total Time		Lbs. Fuel Burned		Lbs. Fuel Remain		NM Flown	
		VFR	IFR	VFR	IFR	VFR	IFR	VFR	IFR	VFR	IFR
A-B	Start engine — condition check	0:05	0:05	0:05	0:05					XX	XX
B-C	Takeoff, climb										
C-D	Normal cruise										
D-E	Descend and land. 1000, fpm maximum (VFR land)										
E-F	Standard inst. app. fuel equal to loiter @1000	XX	0:05	XX	XX	XX	XX	XX	XX	XX	XX
F-G	Climb	XX		XX	XX	XX	XX	XX	XX	XX	XX
G-H	Economy cruise	XX		XX	XX	XX	XX	XX	XX	XX	XX
H-I	Descend enroute and land	XX		XX	XX	XX	XX	XX	XX	XX	XX
Total											

Total distance and avg. speed to destination VFR (B to E) NM _____ kts.
 Total distance and avg. speed to destination IFR (B to E) NM _____ kts.



APPENDIX E: COMPANY RESPONSE TO AN AVIATION ACCIDENT

E.1. Introduction

This appendix provides information and guidance to company management and public affairs personnel regarding press and public inquiries in the event of an accident involving company-operated aircraft. Also provided is a list of specific press concerns to help company personnel effectively prepare for and respond to inquiries.

Issues related to aircraft accidents may be discussed at any time with the staff of the following organizations:

- National Business Aviation Association (NBAA), (800) FYI-NBAA
- National Transportation Safety Board (NTSB), Office of Public Affairs
- Federal Aviation Administration (FAA), Office of Public Affairs
- General Aviation Manufacturers Association (GAMA)

Aircraft accidents are complex and unfortunate events that require a deft personal and corporate response. A company's first and highest responsibility is to the families of those involved in the accident. Every appropriate provision for their comfort and accommodation should be considered, assigned and acted upon first, prior to internal company or public comment. Company management should take steps immediately to notify the families, offer counseling and other support, make needed arrangements and keep them informed.

The primary sources for information regarding the aircraft, crew and passengers involved typically are internal and can be obtained from sources such as flight department records, flight department personnel not involved in the accident, company human resource departments or personnel departments. The leadership of those departments should be contacted at the outset. Public affairs and investor relations personnel as well as insurance providers also should be contacted immediately.

Aircraft accidents often generate acute levels of public and professional scrutiny previously not experienced by management, in an area outside their expertise. Although this attention typically is long-term as an investigation unfolds, the broader public's interest usually is ephemeral. The early acknowledgment of and stated regret for an obvious tragedy, responsibility for the families of those involved in the accident, and a demonstrable corporate attitude of proactive cooperation with investigating authorities are highly recommended. The public's perception of a company's professionalism in the wake of a crisis often significantly

influences public and shareholder opinion of the company's competency.

Ultimately, safety is the responsibility of company management, from the CEO down, and it should be treated as a fundamental matter of the company culture. Management should articulate in writing a strong, permanent and visible commitment to safety. Past aircraft accident investigators have noted that the implementation of corporate safety standards for air transportation often effectively prevent most accidents before they occur.

In the event an accident does occur, company management should have procedures in place to help them respond to the crisis quickly and effectively, often referred to as a business continuation plan (BCP). The following sections recommend specific actions that company representatives should (or should not) take in the aftermath of an aircraft accident. They also identify the facts company representatives should know about the accident and about business aviation in general to answer likely press and public inquiries successfully.

While this *Management Guide* appendix addresses accidents from company management's perspective, flight departments also should have a separate, complementary "pre-accident" plan in place. This latter plan should be practiced or simulated separately and in conjunction with the corporate BCP. Flight department managers can refer to several sources for advice, including this *Management Guide*. Interested parties also may access the U.S. federal government's Code of Federal Regulations (CFR) regarding transportation and the National Transportation Safety Board (Title 49, Volume 5, Chapter VIII) – specifically CFR Title 49, Part 830, titled Notification and Reporting of Aircraft Accidents or Incidents and Overdue Aircraft, and Preservation of Aircraft Wreckage, Mail, Cargo and Records – at www.access.gpo.gov/rara/cfr/index.html.

NBAA will update this appendix as new information becomes available. The Association welcomes feedback from companies, agencies and other sources so that it can continue to improve this document.

E.2. Company Response in the Aftermath of an Accident

After an aircraft accident has occurred, company management and public affairs personnel must deal with several issues. As noted above, a company's first step always should be to accommodate fully the family members of those involved in the accident. Next, company personnel should be prepared to answer questions of fact (not opinion or conjecture; see sections below) posed by aviation authorities, the media and/or the general public related to the trip's purpose and itinerary, the aircraft involved and other related factors. The type of data most frequently requested by authorities is identified below; companies should have such information

on hand as an investigation unfolds. Note, however, that companies should not answer certain questions posed by the media but instead refer them to outside authorities.

For use in a crisis, it is important to create and maintain a crisis communication phone tree or 24/7 contact list for people such as company personnel, company accident response team members, flight department contacts, public emergency contacts, airport emergency contacts, NTSB and FAA contacts, legal advisors and insurance contacts. It will need to be checked and updated regularly to address personnel turnover, a common occurrence.

E.2.1. ACCOMMODATION OF FAMILY MEMBERS

Never forget that a company's first and highest responsibility is to the families of those involved in the accident. A company should anticipate and answer their needs first, prior to internal company or public comment. Company management should take steps immediately to notify the families, offer counseling and other support, make any necessary arrangements and keep them informed. To keep families informed, the company should assign each of them a liaison in a long-term role.

E.2.2. NOTIFICATION OF COMPANY PERSONNEL

Company leadership as well as human resources, flight department, public affairs, investor relations and press relations personnel should be notified of an accident as soon as possible following the incident. After such notification and by prior arrangement, further management of this issue would then be assigned to a response team of the company's design. Only one specifically assigned response team member should communicate with the media regarding the accident. This "sole source" media contact should be identified company-wide, reducing the likelihood of uninformed commentary.

E.2.3. NOTIFICATION OF INSURANCE PROVIDERS

The company's insurance carrier and broker should be contacted as soon as possible after an accident. Additionally, since some insurance providers have their own accident response procedures, company personnel should contact and discuss such information from the provider and use it in conjunction with this *Management Guide* information. If flight department practices plan, the insurance company and broker should participate. Parties should provide emergency contact information for those who will respond to and support an emergency.

E.2.4. PROBABLE CAUSE OF AN ACCIDENT

Do not speculate about the cause of any accident at any time. Company personnel should make no comment regarding the "probable cause" of an accident. Moreover, not only should companies not comment on the probable cause, but they should not comment on the investigation at all, i.e., what was or was not found.

By federal statute, the jurisdiction of investigation and the finding of a probable cause for accidents involving aircraft of U.S. registry is the responsibility of the National Transportation Safety Board, an independent agency of the federal government headquartered in Washington, DC, with nine regional and field offices located throughout the United States. Company management should refer all inquiries regarding the probable cause of an accident to the Office of Public Affairs at the NTSB.

Accidents involving loss of life often will involve the dispatch of an NTSB "Go Team," which will travel rapidly to the site to direct the accident investigation. Aside from immediate public safety concerns at the crash site, the NTSB alone has the jurisdiction and authority to command an accident investigation and issue a probable cause finding. No other agency or authority – federal, state, municipal or local – should or can comment responsibly on the probable cause of an accident.

For accidents that the Board investigates, all questions regarding the aircraft and its contents, crew, passengers, air traffic control personnel, local weather conditions at the time of the accident, or any additional issues relevant to an accident eventually will be commented upon officially by the NTSB.

At the Board's discretion, some accidents involving only property damage will not have an NTSB investigator travel to the accident scene. Although FAA investigators may go to the accident site, these accident investigations are still under the oversight of the NTSB and, therefore, questions concerning these accidents should be directed to the appropriate NTSB regional or field office.

No company personnel should comment on the probable cause of an aircraft accident for several reasons. First, the jurisdiction for determining probable cause is the NTSB's alone. Second, speculation may adversely affect a company's legal liability with regard to the accident. Third, accidents typically are complex events not completely understood until after at least several months of analysis are completed, if then. Company personnel rarely are qualified accident investigators, a unique specialization. Consequently, initial comments and conclusions by accident observers frequently are in error, typically confusing the issue or worse.

At a company's request, the National Business Aviation Association may be "a party to" the NTSB investigation process, bringing additional business aircraft operator expertise and perspective to the process. Requests for NBAA participation should be referred immediately to the NBAA senior vice president of operations.

E.2.5. SCHEDULING PRESS STATEMENTS

Although the pressures for instant answers in the wake of an aviation accident can be extreme and from many quarters, accurate information seldom is available early or at the

press's convenience. Companies are cautioned to move as quickly as possible regarding the accommodation of family members, and as prudently as possible regarding the press. Respect for reporter deadlines must be tempered by consideration for the families and the ability of the company to respond professionally and with accuracy. When in doubt, and when possible, it is best to wait and schedule statements and meetings with reporters later rather than earlier.

If the NTSB is investigating the accident, companies should not speak about the accident investigation. However, companies can release factual information. The NTSB's rule of thumb is that if you could have said it the day before the accident, you can say it the day after. Therefore, the Board permits, and actually would encourage, companies to release information concerning the aircraft, such as make, model, age and ownership; the identity of the company itself; the purpose of the flight; and the names of the crew and passengers. Additionally, it would be helpful to the NTSB if the company's public affairs personnel contacted the NTSB's public affairs officers to notify them of any press statements.

E.2.6. AIRCRAFT INVOLVED

Company management should be familiar with or know where to find information that relates to their aircraft, examples of which are listed and defined in the following section.

Type, Type Designation – Information regarding aircraft identification, including the name of the manufacturer and model number or name of the aircraft, should be contained within flight department or company administrative records. Typically, this information is reported using an official FAA "type designation" – a series of letters and numbers with which the FAA officially designates the aircraft type, such as "Dassault Falcon DA-20F" or "Learjet LR-25B."

Acquisition Date – On what date did the company take control of the aircraft? Prior owners also can be relevant, if recent.

Engine Data – Engine information includes the number, identity of the manufacturer and model number of the aircraft's engines. Such data often are reported separately and distinctly from the airframe's identification. The number of hours in operation each engine has experienced may be reported. Also, the number of hours in operation since the last major overhaul or major service interval often is reported. All of this information may be available internally, through records kept by a company's flight department. Alternately, if maintenance has been performed externally, the vendor for that service should have records including this and other information.

Black Boxes – Unlike commercial airliners, business aircraft typically are not required by Federal Aviation Regulation to use cockpit voice recorders and flight data recorders, also known as black boxes. However, some business aircraft

(typically sophisticated jets) do carry cockpit voice recorders and/or flight data recorders onboard. If such is the case, company or manufacturer records will indicate their existence. This information is useful for response to press or other inquiries. However, company representatives should limit comments to whether the aircraft had black boxes or not; they should not comment on the recorded data.

Performance – All questions related to the expected performance of the aircraft should be referred to the aircraft's manufacturer. Because accidents inherently call into question the performance of the aircraft – issues such as flight characteristics, fuel use, passenger and cargo loads, center of gravity concerns, etc., all can and will be raised – and because these issues often contribute to probable cause findings, companies should decline to speculate on the aircraft's expected performance. All aircraft registered in the U.S. have been certified by the FAA and extensively tested to ensure their safe operation under conditions defined in the aircraft's operating manual, a public document.

Performance specifications of the aircraft, as certified by the FAA, are available in the aircraft's operating manual or from the aircraft's manufacturer. The General Aviation Manufacturers Association, based in Washington, DC, can supply contact information for aircraft manufacturers. As a second source, extensive descriptive data about business aircraft also are published in *Jane's All The World's Aircraft*, which contains information about aircraft manufactured worldwide. Jane's is published annually and is readily available at most major libraries. A third source for aircraft operational data is the *Planning & Purchasing Handbook*, published by *Business and Commercial Aviation*, a business aviation trade publication.

Ownership and Management – The legal ownership of the aircraft usually is obvious. Under certain ownership options, however, ownership can be blurred. What entity holds legal title to the aircraft? Who is the "practical" owner/operator of the aircraft? Reporters typically will be uninterested in the legal nuances and will want to report the aircraft's real-world operator.

Who has management control of the aircraft? Under certain ownership options, management of the aircraft can be outsourced to a management company, shared, or employ other resourcing strategies. Due to the often-complex nature of such ownership agreements, a company's legal counsel or CFO typically is the most knowledgeable source of information regarding the ownership and management of company aircraft. However, information regarding aircraft operated by a third party, such as those operated by a management company or under a fractional ownership agreement, also can be secured through those companies.

Age – The age of an aircraft refers to both how old the aircraft is in years and the amount of hours flown, also known as hours "on the airframe." Takeoff and landing or start-up and shut-down "cycles" also sometimes are reported.

This information typically is available from aircraft logbooks located in the company flight department's or pilot's office at the airport where the aircraft is based.

Maintenance Standards and FAA Inspections – It is important to note the maintenance philosophy of the company regarding the aircraft, which is typically stringent. To what standards or with what attitude was the aircraft maintained? Where was the aircraft maintained? If the aircraft was maintained in-house, what were the qualifications of the airframe and power plant maintenance technicians? Additionally, information regarding the aircraft's most recent FAA inspection should be available within the company's flight department or through a maintenance vendor.

As part of its investigation, the NTSB will review the maintenance records of the accident aircraft. A proactive approach to maintenance, and the disclosure of maintenance records to authorities, is strongly recommended. However, public company comments regarding the maintenance of the accident aircraft should be extremely limited.

Because maintenance records typically are impounded rapidly following an accident, access to them can be limited to preexisting duplicates retained by some operators.

E.2.7. TRIP PURPOSE AND ITINERARY

It usually is sufficient for a company to provide a general rather than a specific characterization of a trip's purpose to the public. The flight's expected departure/arrival dates and times, departure/destination locations and timing normally are reported following an accident.

E.2.8. PASSENGERS

Company management should keep information regarding an aircraft's passengers on hand in the event of an accident. Such information includes names, titles, ages, professional biographies and names of family members.

E.2.9. CREW

Company management always should record information regarding an aircraft's crew in the event of an accident. Such information includes the names and titles of pilot(s) and other onboard crew; qualifications of flightcrew members, including ratings held, hours of flight experience in aircraft involved and hours of flight experience in general; company training philosophy; and the safety record of company aircraft. Companies should expect and preempt aggressive efforts, including invasive inquiries to victims' families, to secure photographs or "stories" about those involved in the accident.

E.2.10. AIR TRAFFIC CONTROL

All questions concerning the NTSB's investigation should be referred to the NTSB, including any questions about air traffic control. After an accident occurs, the NTSB will obtain air traffic control tapes pertaining to the accident from the FAA and examine them. When the NTSB returns air traffic control tapes to the FAA, typically a couple of weeks after the accident, the FAA will make the tapes public.

E.2.11. LOCAL WEATHER

Company management should refer weather questions to the nearest airport's management office or local weather authorities (the nearest National Weather Service office is a good source), which typically have access to local weather conditions.

GLOSSARY

The Glossary consists of technical terms and acronyms used throughout the *NBAA Management Guide*. Other commonly used aeronautical terms also are included.

AAAE

American Association of Airport Executives

ABAA

Australian Business Aircraft Association. A member of the International Business Aviation Council, Ltd.

ABAG

Associação Brasileira de Aviação Geral. A member of the International Business Aviation Council, Ltd.

AC

Advisory Circular. A series of external FAA publications consisting of all non-regulatory material of a policy, guidance or informational nature.

APS

Accident Prevention Specialist. An FAA representative who determines if remedial training can be performed as an enforcement action for a violation.

ACDO

Air Carrier District Office. An FAA field office serving an assigned geographic area, staffed with Flight Standards personnel serving the aviation industry and the general public on matters related to the certification and operation of scheduled air carriers and other large aircraft operations. (Airman's Information Manual).

ACFO

Aircraft Certification Field Office

ACI

Airports Council International

AD

Airworthiness Directive. A regulatory notice sent out by the FAA to the registered owner of an aircraft informing the owner of a condition that must be corrected for the aircraft to maintain its airworthiness status. ADs are prescribed under FAR Part 39 – Airworthiness Directives.

ADAP

Airport Development Assistance Program (U.S.)

Additional Reservation

An approved IFR/VFR reservation above the maximum IFR reservation limit at a high density traffic airport (HDTA). Additional reservations are available for unscheduled operations only. (Advisory Circular 90-43G)

ADF

Automatic Direction Finder

ADIZ

Air Defense Identification Zone. The area of airspace over

land or water within which the ready identification, the location, and the control of aircraft are required in the interest of national security. (The FAA Statistical Handbook of Aviation: Calendar Year 1989)

ADMA

Aviation Distributors and Manufacturers Association

Administrative Action

A type of enforcement action utilized by the FAA under FAR Section 13.11 if an alleged violation meets the following criteria: (1) No significant unsafe condition existed; (2) lack of competency or qualification was not involved; (3) the violation was not deliberate; and (4) the alleged violator has a constructive attitude toward complying with the regulations, and has not been involved previously in similar violations. The action takes the form of either a Warning Notice or a Letter of Correction. (FAA Order 2150.3A)

Administrator

The Federal Aviation Administrator or any person to whom the Administrator has delegated authority in the matter concerned. (FAR Section 1.1)

AFD

Airport/Facility Directory. A publication designed primarily as a pilot's operational manual which contains data on all airports, seaplane bases and heliports open to the public and includes communications data, navigational facilities and certain special notices and procedures. This publication is issued in seven volumes according to geographical area and is available through the National Ocean Service. (Airman's Information Manual) AFS – Airway Facilities Sector

AFP

Airspace Flow Program

AIA

Aerospace Industries Association

AIM

Airman's Information Manual. A primary FAA publication whose purpose is to instruct airmen about operating in the National Airspace System of the U.S. It provides basic flight information, ATC procedures and general instructional information concerning health, medical facts, factors affecting flight safety, accident and hazard reporting and types of aeronautical charts and their use. (Airman's Information Manual)

AIP

Aeronautical Information Publication. A publication issued by or with the authority of a State (ICAO member) and containing aeronautical information of a lasting character essential to air navigation. (North Atlantic International General Aviation Operations Manual)

Airport Improvement Program (AIP) – A program that provides grants for the planning and development of public-use airports that are included in the National Plan of Integrated Airport Systems (NPIAS).

Air Carrier

A person who undertakes directly by lease, or other arrangement, to engage in air transportation. (FAR Section 1.1) The commercial system of air transportation, consisting of the certificated air carriers, air taxis (including commuters), supplemental air carriers, commercial operators of large aircraft and air travel clubs. (FAA Statistical Handbook of Aviation: Calendar Year 1989)

Air Taxi

A classification of air carriers that transports in accordance with FAR Part 135 persons, property and mail using small aircraft. (FAA Statistical Handbook of Aviation: Calendar Year 1989)

Air Traffic Hub

Air traffic hubs are not airports; they are the city or twin cities requiring aviation services. The hubs fall into four classes that are determined by each community's percentage of total enplaned passengers, all services, and all operations of U.S. certificated air carriers in the 50 states, the District of Columbia and other U.S. areas. (FAA Statistical Handbook of Aviation: Calendar Year 1989)

Aircraft

A device that is used or intended to be used for flight in the air. (FAR Section 1.1) This includes airplanes, helicopters, gliders and others.

Aircraft Accident

An occurrence associated with the operation of an aircraft that takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and during which any person suffers death or serious injury or the aircraft receives substantial damage. (NTSB Section 830.2)

Aircraft Engine

An engine that is used or intended to be used for propelling aircraft. It includes turbosuperchargers, appurtenances, and accessories necessary for its functioning, but does not include propellers. (FAR Section 1.1)

Aircraft Resourcing Options

The aircraft resourcing options available to companies can be categorized and defined in six ways:

- Whole Aircraft In-House Flight Department – An entity being the only registered owner of an aircraft and utilizing an in-house flight department
- Whole Aircraft Management Company – An entity being the only registered owner of an aircraft and utilizing a management company
- Joint Ownership (In-House Flight Department) – Two or more entities are registered owners of an aircraft and one of the owners operates the aircraft for all owners
- Co-Ownership (Management Company) – Two or more entities are registered owners of an aircraft and use a management company to manage the aircraft for all owners

- Fractional Ownership – Several entities are registered owners of an aircraft, hire a management company to manage the aircraft and allow the management company to exchange this aircraft among their fleet of aircraft
- Charter – A company that provides aircraft and crew to the general public for compensation or hire (profit)

Airman

A pilot, maintenance technician or other licensed aviation technician. Certification standards are found in FAR Part 61, Certification: Pilots and flight instructors; FAR Part 63, Certification: Flightcrew members other than pilots; and FAR Part 65, Certification: Airmen other than flightcrew members. Medical standards are found in FAR Part 67, Medical standards and certification.

Airport Manager

The person authorized by the airport authority to exercise administrative control of the airport.

Airside

The part of the airport facility where aircraft movements take place.

Airway

Controlled airspace in the form of a corridor in which the centerline is defined.

Airworthiness Certificate

A certificate issued by the FAA to all aircraft that have met the minimum standards required for certification.

Airworthy

The condition of an aircraft, engine or component that meets all of the requirements for its original certification.

ALPA

Air Line Pilots Association

Altimeter

An instrument for registering the height of an aircraft, usually in terms of feet above sea level.

AMB

Aircraft Maintenance Base

AME

Aviation Medical Examiner. A licensed physician designated by the Administrator to perform appropriate medical examinations and to issue or deny medical certificates prescribed by the FAR. Rules are found in FAR Part 183, Representatives of the Administrator.

Annexes

ICAO Standards and Recommended Practices (SARPS)

Annual Inspection

A complete inspection of an aircraft and engine required by FAR Section 91.409 to be accomplished every 12 calendar months on all certificated aircraft.

AOPA

Aircraft Owners and Pilots Association

A&P

Airframe & Powerplant Maintenance Technician. An aircraft maintenance technician who has met the experience and knowledge requirements of the FAA and is authorized to return an aircraft to service after certain inspections and maintenance procedures. Certification standards are found in FAR Part 65, Certification: Airmen other than flightcrew members.

Appliance

Any instrument, mechanism, equipment, part, apparatus, appurtenance or accessory, including communications equipment, that is used or intended to be used in operating or controlling an aircraft in flight, is installed in or attached to the aircraft, and is not part of an airframe, engine, or propeller. (FAR Section 1.1)

Apron

Area on the airside of the terminal where aircraft are parked and where handling activities take place. (Also known as a ramp.)

Approved Data

Data that may be used as an authorization for the techniques or procedures for making a repair or an alteration to a certificated aircraft. Approved data may consist of such documents as Advisory Circular 43.13-1A or 2A, Manufacturers' Service Bulletins, Manufacturer's kit, instructions, Airworthiness Directives or specific details of a repair issued by the engineering department of the manufacturer.

AQP

Advanced Qualification Program. A program approved under Subpart Y of Part 121. It provides an alternate method of qualifying, training, certifying and otherwise ensuring the competency of flightcrew members, flight attendants, aircraft dispatchers, instructors, evaluators and other operations personnel subject to the training and evaluation requirements of Part 121 or Part 135.

Area Control Center (ACC)

An ICAO term for an air traffic control facility primarily responsible for providing ATC services to IFR aircraft in controlled areas under its jurisdiction. An ACC is the international equivalent of an Air Route Traffic Control Center (ARTCC). (North Atlantic International General Aviation Operations Manual)

ARINC

Aeronautical Radio, Inc. A corporation largely owned by a group of airlines, and licensed as an aeronautical station. ARINC is contracted by the FAA to provide communications support for air traffic control and meteorological services in portions of international (usually oceanic) airspace. (North Atlantic International General Aviation Operations Manual.)

ARO

Airport Reservations Office. An operational unit of the Traffic Flow Management Branch responsible for administration of IFR reservations in accordance with FAR Part 93, Subpart K and agency procedures issued thereunder. (Advisory Circular 90-43G)

ARSA

Airport Radar Service Area

ARTCC

Air Route Traffic Control Center. A facility established to provide air traffic control service to aircraft operating on IFR flight plans within controlled airspace and principally during the en route phase of flight. When equipment capabilities and controller workload permit, certain advisory/assistance services may be provided to VFR aircraft. (Airman's Information Manual)

ASM

Available Seat-Miles

ASO

Airport Service Organization

ASR

Airport Surveillance Radar

ATA

Air Transport Association of America

ATA System

ATA's standardized format for maintenance manuals.

ATC

Air Traffic Control. A service operated by appropriate authority to promote the safe, orderly and expeditious flow of air traffic. (FAR Section 1.1)

ATCSCC

FAA Air Traffic Control System Command Center

ATCT

Air Traffic Control Tower. A central operations facility in the terminal air traffic control system, consisting of a tower cab structure, including an associated IFR room if radar equipped, using air/ground communications and/or radar, visual signaling and other devices, to provide safe and expeditious movement of terminal air traffic.

ATS

Air Traffic Services

AWOS

Automated Weather Observing System. A weather reporting system that consists of various sensors, a processor, a computer-generated voice subsystem and a transmitter to broadcast local, minute-by-minute weather data directly to the pilot. Some systems are configured to permit the addition of an operator-generated voice message. Similar to the National Weather Service's Automated Surface Observation System (ASOS).

Automatic Reinstatement

A policy provision that automatically restores the prior insured value of an aircraft after completion of repairs.

Average Stage Length

The total number of travel miles divided by the total landings or takeoffs. It is generally expressed in nautical miles for operational purposes and occasionally in statute miles for business purposes.

Azimuth

The angle from the north (moving clockwise) graduated into 360 degrees.

BAAI

Business Aviation Association for India. A member of the International Business Aviation Council, Ltd.

BAASA

Business Aviation Association for Southern Africa. A division of the CAA/SA and a member of the International Business Aviation Council, Ltd.

Based Aircraft

Aircraft permanently stationed at an airport by agreement between the owner and the airport management.

BBGA

British Business and General Aviation Association. A business aircraft operator's association in the United Kingdom and a member of the International Business Aviation Council, Ltd. Formerly Business Aircraft Users Association, Ltd.

Bilateral Agreement

Agreement or treaty between two nations to establish international services.

Block Time

The time from the moment the aircraft first moves under its own power for the purpose of flight until the moment it comes to rest at the next point of landing. Also known as flight time. (FAR Section 1.1)

BRNAV

Basic RNAV, or Basic Area Navigation System, is what Required Navigational Performance (RNP) is known as in continental Europe. See also RNP.

Bogus Parts

Parts not approved for use in a certificated airplane. These parts are often marked so as to appear to be authorized parts, but when installed in an airplane, safety may be compromised.

CAA/SA

Commercial Aviation Association of South Africa.

Cabotage

Known as the fifth "freedom of the air" in which an aircraft picks up passengers, cargo and mail at one point in a state,

other than the state of its own registry, and discharges same at another point in the grantor's state.

Cabotage Rights

Right of an aircraft from country A to carry traffic between two points in country B.

Category (of Aircraft)

A grouping of aircraft based upon intended use or operating limitations such as airplane, rotorcraft or glider. (FAR Section 1.1)

CBAA

Canadian Business Aircraft Association, Inc. A business aircraft operators association based in Canada and a member of the International Business Aviation Council, Ltd.

CAM

Certified Aviation Manager. A business aviation professional who has been certified as having a distinct level of industry knowledge, experience and qualifications.

CDM

The Collaborative Decision Making (CDM) Workgroup is a joint government/industry initiative that works to improve airspace flow-control and decision-making as well as long-term strategic planning in the National Airspace System.

Certificated Air Carrier

An air carrier holding a Certificate of Public Convenience and Necessity issued by DOT to conduct scheduled services. These carriers operate large aircraft in accordance with FAR Part 121. Nonscheduled or charter operations also may be conducted by these carriers without holding a Certificate of Public Convenience and Necessity under FAR Part 135.

Certificated Flight Instructor

CFI. A certificated pilot authorized by the FAA to give flight training. Certification requirements are found in FAR Part 61, Certification: Pilots and flight instructors.

CFR

Code of Federal Regulations

Charter

See aircraft resourcing options.

Check Pilot

A pilot designated by the company and/or the FAA to check other pilots to determine their proficiency with respect to procedures and techniques to perform their various piloting duties. Regulations for those designated by the FAA are found in FAR Part 183, Representatives of the Administrator.

Chief Pilot

Designated pilot whose experience as a leader and competence as a pilot is a qualification to direct other pilots. Chief pilot requirements for an operator certificated under FAR Part 135 can be found in Part 119.71, under Management personnel qualifications. No regulations exist for operations under FAR Part 91.

Class (of Aircraft)

A broad grouping of aircraft having similar characteristics of propulsion, flight or landing. (FAR Section 1.1) Examples are landplane, seaplane, helicopter, gyroplane and free balloon.

Class Rate

The premium that is estimated by an insurance company to be adequate for a particular risk.

Co-Ownership

See aircraft resourcing options.

Coinurance

Two or more policies issued by different insurance companies covering the same risk. Also, a sharing of a risk by the insurer and the insured on a percentage basis.

Commercial Operator

A person who, for compensation or hire, engages in carriage by aircraft in air commerce of persons or property, other than as an aircarrier or foreign air carrier or under the authority of FAR Part 375. Where it is doubtful that an operation is for "compensation or hire," the test applied is whether the carriage by air is merely incidental to the person's other business or is, in itself, a major enterprise for profit. (FAR Section 1.1)

Common Carrier

Transportation company that offers its services for public use.

Competency Check

A flight check given by a check airman to determine a pilot's competence in practical skills in that aircraft or class of aircraft.

COMSAT

U.S. Signatory to Inmarsat Providing Satellite Communications.

Conflict of Laws

Differences of law in different counties, municipalities, states or countries, affecting people who have made agreements or contracts in two or more of said areas.

Controlled Airspace

Controlled airspace means an airspace of defined dimensions within which air traffic control service is provided to IFR flights and to VFR flights in accordance with the airspace classification. Controlled airspace is a generic term that covers Class A, Class B, Class C, Class D and Class E airspace.

CONUS

Continental United States

Corporate Business Aircraft

Aircraft that is corporate-owned or operated, flown by a professional flightcrew and used for the transportation of executives, employees, customers and guests.

Corporate Flying

Use of aircraft, owned or leased, that are operated by a corporation for the transportation of personnel or cargo and are

flown by a professional flightcrew who receive direct salary and compensation from the corporation for that service.

Country-of-Origin

Right of each country to establish whatever conditions it requires for air services originating from it.

Crewmember

A person assigned to perform duty in an aircraft during flight time.

CVR

Cockpit Voice Recorder.

dB

(A-weighted sound pressure level) A sound pressure level that has been filtered or weighted to quantitatively reduce the effect of low frequency noise. It is designed to approximate the response of the human ear.

Decibel

A logarithmic measurement used to define the relative intensity or ratio of sound. It is noted by the symbol dB.

DG

Directional Gyro

Differences Training

The training required for crewmembers and dispatchers who have qualified and served on a particular airplane, when the Administrator finds differences training is necessary for a crewmember to serve in the same capacity on a particular variation of that airplane.

DME

Distance Measuring Equipment

DMIR

Designated Manufacturing Inspection Representative

DOD

Department of Defense (U.S.)

DP

Departure Procedure

Dry Lease

Refers to the lease of the aircraft only. The flightcrew is not included in the lease package. (Advisory Circular 91-37A)

DUAT

Direct User Access Terminal. A personal computer system used to retrieve weather/NOTAMs and to file flight plans.

Duty Time

The total amount of time a flightcrew member is on duty, beginning when the person reports for an assignment and ending when the person is released from that assignment. It includes all flight and non-flight related tasks.

EAA

Experimental Aircraft Association

EBAA

European Business Aviation Association. A pan-European business aircraft operators association and a member of the International Business Aviation Council, Ltd.

EBAA France

European Business Aviation Association – France. A member of the International Business Aviation Council, Ltd.

ECAC

European Civil Aviation Conference

EDCT

Estimated Departure Clearance Time

EFIS

Electronic Flight Information System

ELT

Emergency Locator Transmitter. A small, self-contained radio transmitter that will manually or automatically, upon the impact of a crash, transmit an emergency signal on 121.5, 243.0 and/or 406 MHz. Requirements for aircraft are found in FAR Section 91.207 and ICAO Standards and Recommended Practices, Annex 6, Parts 1 and 2. Note: In the year 2009, 121.5/243 MHz will no longer be monitored via satellite-based monitoring. After the date of satellite monitoring termination in 2009, 121.5 MHz signals transmitted from ELTs operated on the lower frequency only will be detected by ground-based receivers or over-flying aircraft.

EMDO

Engineering Manufacturing District Office

Enhanced Vision System (EVS)

A system that uses infrared and very low frequency wavelength radar to penetrate visually limiting meteorological phenomenon.

EPA

Environmental Protection Agency

ETA

Estimated Time of Arrival

Exclusions

Certain clauses in a insurance policy that specify situations or special conditions in which coverage would be invalidated.

Exemption

A provision in FAR Part 11 of the Federal Aviation Regulations for a person, certificate holder or organization (such as NBAA) to be exempt from the requirements of a regulation.

FAA

Federal Aviation Administration (FAR Section 1.2)

FANS

The ICAO Council Special Committee for Future Air Navigation Systems

FAR

Federal Aviation Regulations. Title 14 of the Code of Regulations.

Fatal Injury

Any injury that results in death within 30 days of the accident. (NTSB Section 830.2)

FBO

Fixed Base Operator

FCA

Flow Constrained Area

FCC

Federal Communications Commission

FDA

Flight Data Recorder

FEA

Flow Evaluation Area

FEC

Federal Election Commission

FIFO

Flight Inspection Field Offices

Financial Responsibility Laws

Laws structured to make it impossible for the reckless and financially irresponsible operator of a conveyance to secure a commercial operator's license unless there is a guarantee that he is able to pay, within the limits established by the statutes, damages for which he becomes liable.

Five Freedoms of the Air

(1) the right to fly over the territory of a foreign nation without landing; (2) the right to land on the territory of a foreign nation for non-traffic purposes (i.e., refueling, emergency repairs); (3) the right to put down in a foreign country passengers, mail and cargo taken on in the state whose nationality the aircraft possesses; (4) the right to take on passengers, mail and cargo in a foreign country for the state whose nationality the aircraft possesses; and (5) the right to put down/or take on in a foreign country passengers, mail and cargo from or for the territory of a foreign country. (Also referenced is an unofficial "sixth freedom" that allows total freedom from constraints.)

Flight Attendant

A crewmember assigned to duty on an aircraft, whose primary responsibility is ensuring passenger safety and comfort, and whose training includes instruction in aircraft familiarization, evacuation procedures, emergency procedures and passenger handling.

Flight Information Center (FIC)

A unit established to provide flight information service and alerting service. (North Atlantic International General Aviation Operations Manual)

Flight Information Region (FIR)

An airspace of defined dimensions within which flight information service and alerting services are provided. (North Atlantic International General Aviation Operations Manual)

Flight Test

Flight for the purpose of investigating the operation/flight characteristics of an aircraft or aircraft component; or a flight for the purpose of evaluating an applicant for a pilot certificate or rating. (Airman's Information Manual)

Flight Time

The time from the moment the aircraft first moves under its own power for the purpose of flight until the moment it comes to rest at the next point of landing. Also known as block to block time. (FAR Section 1.1)

Flightcrew Member

A pilot, flight engineer, or flight navigator assigned to duty in an aircraft during flight time. (FAR Section 1.1)

FMS

Flight Management System. An on-board computer system that integrates multiple sources of navigation input from a database and real time entries.

Fractional Ownership

See aircraft resourcing options.

FSD

Federal Security Director

FSDO

Flight Standards District Office. An FAA field office serving an assigned geographical area and staffed with Flight Standards personnel who serve the aviation industry and the general public on matters relating to the certification and operation of air carrier and general aviation aircraft.

Activities include general surveillance of operational safety, certification of airmen and aircraft, accident prevention, investigation, enforcement, etc. (Airman's Information Manual)

FSF

Flight Safety Foundation, Inc.

FSS

Flight Service Station. Air traffic facilities that: (1) provide pilot briefing, en route communications, and VFR search and rescue services; (2) assist lost aircraft and aircraft in emergency situations; (3) relay ATC clearances; (4) originate notices to airmen; (5) broadcast aviation weather and national airspace system information; (6) receive and process IFR flight plans; and (7) monitor navigation aids. In addition, at selected locations, an FSS provides en route flight advisory service, take weather observations, issue airport advisories, and advice customs and immigration of transborder flights. (Airman's Information Manual)

GAMA

General Aviation Manufacturer's Association. An association of U.S. manufacturers of general aviation aircraft.

GBAA

German Business Aviation Association. A business aircraft operator's association in Germany and a member of the International Business Aviation Council, Ltd.

GDP

Ground Delay Program. GDPs are implemented to control air traffic volume arriving at airports where the projected traffic demand is expected to exceed the airport's acceptance rate for a given period of time. Periods of demand exceeding acceptance rate are normally a result of the airport's acceptance rate being reduced for some reason. The most common reason for a reduction in acceptance rate is adverse weather such as low ceilings and visibility.

General Aviation

The portion of civil aviation that encompasses all facets of aviation except scheduled air carriers, state-operated and military aircraft.

General Aviation Airport (Public Airport)

Airport that is used for public purposes, under the control of a public agency, and whose landing area is publicly owned; these airports service aircraft owned by private individuals or firms that are used primarily for business and recreational flying.

GPS

Global Positioning Satellite Navigation System which is operated by the U.S. Department of Defense.

HAI

Helicopter Association International

HUD

Head-Up Display. It presents electronic flight information in the pilot's field of vision while the pilot looks through the windshield.

IA

Inspection Authorization. An FAA-issued certificate issued to an individual under FAR Section 65.91 granting authority to certify that specific maintenance inspections have been completed in order to return aircraft to service after maintenance, alterations or repairs.

IAOPA

International Aircraft Owners and Pilots Association

IATA

International Air Transport Association

IBAA

Italian Business Aviation Association. A member of the International Business Aviation Council, Ltd.

IBAC

International Business Aviation Council, Ltd. An organization based in Montreal that represents, promotes and protects the interests of business aviation in international forums.

ICAO

International Civil Aviation Organization (FAR Section 1.2). A specialized agency of the United Nations whose objective is to develop the principles and techniques of international air navigation and to foster planning and development of international civil air transport. (Airman's Information Manual)

ICAO Airport

Designated U.S. Airports Serving International Operations ICAO airports are those designated under Article 68 of the Convention on International Civil Aviation as airports serving international operations (for traffic or refueling purposes). U.S. airports so designated are identified in ICAO Regional Air Navigation Plans, Document 8755 (North Atlantic, North American, and Pacific Region) and Document 8733 (Caribbean and South American Regions) and include those regularly served by scheduled and nonscheduled international commercial air transport, those designated as alternates, and those used regularly by international general aviation flights. (Advisory Circular 150/5000-5B)

ICAP

Interagency Committee on Aviation Policy

ICC

Interstate Commerce Commission

IFIM

International Flight Information Manual (FAA)

IFR

Instrument Flight Rules (FAR Section 1.2)

IFSS

International Flight Service Station. A central operations facility in the flight advisory system, staffed and equipped to control aeronautical point-to-point telecommunications and air/ground telecommunications with pilots operating over international territory or waters, which provides flight plan following, weather information, search and rescue action and other flight assistance operations. (FAA Statistical Handbook of Aviation: Calendar Year 1989)

IGA

International General Aviation. All international civil aviation operations other than scheduled air services and non-scheduled air transport operations for remuneration or hire. (North Atlantic International General Aviation Operations Manual)

IGIA

Interagency Group on International Aviation. An association that coordinates U.S. response of Federal agencies and the aviation community to international aviation forums.

ILS

Instrument Landing System (FAR Section 1.2)

Incident

An occurrence other than an accident associated with the operation of an aircraft, that affects or could affect the safety of operations. (NTSB Section 830.2)

In-flight

This refers to maneuvers, procedures or functions that must be conducted in the airplane.

In-House Flight Department

See aircraft resourcing options.

Initial Operating Experience (IOE)

A pilot who has completed training for a position and aircraft type must perform this flight with a check airman. The minimum hours are: 10 hours for a single-engine aircraft; 15 hours for a multiengine reciprocating aircraft; 20 hours for a multiengine turbine-engine-powered aircraft; 25 hours for a turbojet-powered airplane. Requirements are found in FAR Section 135.244.

Initial Training

The training required for crewmembers who have not qualified and served in the same capacity on another airplane of the same group.

INMARSAT

International Maritime Satellite

INOTAMS

International Notices to Airmen

INP

Inertial Navigation Platform

INS

Inertial Navigation System

International Airports of Entry

These airports that have been designated as international airports for customs purposes. They are open to all international aircraft for entry and clearance purposes without the necessity of obtaining permission. However, advance notice of arrival is required so inspectors may be available. Designation as an international airport of entry follows application by the airport operator and finding by the U.S. Customs Service that the airport will generate sufficient international traffic. An airport of entry must provide adequate space and facilities for Customs and Federal inspection purposes and satisfy certain other requirements established by the U.S. Customs Service. (Advisory Circular 150/5000-5B)

Investigations

A procedure used by the FAA under FAR Part 13 to review the existence of an alleged violation. The FAA is authorized to conduct investigations, hold hearings, issue subpoenas, require the production of relevant documents, records and property, and take evidence and depositions.

IRC

Internal Revenue Code

JBAA

Japan Business Aviation Association. A member of the International Business Aviation Council, Ltd.

Joint Ownership

See aircraft resourcing options.

Landing Rights Airports

Landing rights airports are those airports where incoming international flights must obtain prior permission to land and must furnish advance notice of arrival to U.S. Customs. This category of airports includes most of the so-called major U.S. "international airports." Advance notice of arrival may be transmitted via flight plans at those airports where Advise Customs (ADCUS) service is available and such notice is treated as application for permission to land. Customs officers may, at their discretion, grant blanket "landing rights" to individuals or companies at certain airports for a specific period of time, in which case advance notices of arrival are the only requirement. This blanket permission is generally given for scheduled airline flights at busy landing rights airports. (Advisory Circular 150/5000-5B)

Large Aircraft

An aircraft with a maximum gross weight of more than 12,500 pounds. (FAR Section 1.1)

Layover

Time spent by the aircraft and crew in the middle of a trip other than at home base.

Lease

Agreement by which the owner of a property rents and permits it to be used by a tenant or lessee on payment of a consideration.

Leaseback

A sale of property with a lease given by the purchaser back to the original owner.

Letter of Correction

A letter or form from the FAA to an alleged violator that (1) brings to the attention of the alleged violator the facts and circumstances of the incident; (2) advises that, based on available information, such operations or practices are contrary to the regulations; (3) states that the matter has been corrected and/or does not warrant legal enforcement action; and (4) requests future compliance with the regulation. It is intended to be used when there is agreement with the company, organization, or airmen that corrective action acceptable to the FAA has been taken, or will be taken, within a reasonable time. (FAA Order 2150.3A)

Letter of Investigation

A written notification, which is not required, from the FAA to an alleged violator of an FAA investigation.

Lien

A claim against another's property.

Lien (Mechanic's)

The right of maintenance personnel to retain property in their control until services rendered have been paid for in full.

Line Check

A check, given by a check airman, that consists of a flight over a typical route.

Localizer

Electronic course guidance to the runway used in a precision instrument approach to a landing.

Loran

Long Range Navigation. An electronic navigation system by which hyperbolic lines of position are determined by measuring the difference in the time of reception of synchronized pulse signals from two fixed transmitters. This allows for direct navigation from any point to any point within the area of coverage.

Mach Number (M)

The ratio of true airspeed to the speed of sound. (FAR Section 1.1)

Maintenance

Inspection, overhaul, repair, preservation and the replacement of parts of airframes, powerplants, propellers, rotors and appliances. This term excludes preventive maintenance. (FAR Section 1.1)

Maintenance Manual

A manual produced by the manufacturer of an aircraft, aircraft engine or component that details the approved method of maintenance.

Maintenance Release

A return to service approval in the appropriate maintenance record.

Major Alteration

An alteration not listed in the aircraft, aircraft engine or propeller specifications that might appreciably affect weight, balance, structural strength, performance, powerplant operation, flight characteristics or other qualities affecting airworthiness; or that is not done according to accepted practices or cannot be done by elementary operations. (FAR Section 1.1). A list of alterations considered major appears in Appendix A of FAR Part 43 and recordkeeping requirements are found in Appendix B of FAR Part 43.

Major Repair

A repair that if properly done, might appreciably affect weight, balance, structural strength, performance, powerplant operation, flight characteristics or other qualities affecting airworthiness; or that is not done according to accepted practices or cannot be done by elementary operations. (FAR Section 1.1). A list of repairs considered major

appears in Appendix A of FAR Part 43 and recordkeeping requirements are found in Appendix B of FAR Part 43.

Marker Beacon

Instrument that provides aural and/or visual identification of a specific position along an instrument approach landing.

MEBAA

Middle East Business Aviation Association. A member of the International Business Aviation Council, Ltd.

MEL

Minimum Equipment List. A list of aircraft appliances and equipment that must be functioning for an aircraft to be flown. Approval requirements are found in FAR Section 91.213

MIDO

Manufacturing Inspection District Office. Provides for original and supplemental airworthiness certification approval of civil aircraft, engines, propellers, parts and appliances and conducts inspection surveillance of manufacturing facilities producing civil aircraft, engines and propellers to determine compliance with prescribed safety standards. This office could be helpful when preparing to export an aircraft.

Miles-in-Trail Restrictions

A traffic management tool used to control the amount of traffic destined for or passing through Center Sectors that have temporary capacity constraints

Minor Alteration

An alteration other than a major alteration. (FAR Section 1.1)

Minor Repair

A repair other than a major repair. (FAR Section 1.1)

MIS

Management Information Systems. Computer-controlled systems management.

MLS

Microwave Landing System. A precision instrument approach system operating in the microwave spectrum that consists of an azimuth station, an elevation station and precision distance measuring equipment. (Airman's Information Manual.)

MNPS

Minimum Navigation Performance Specification. A specified set of minimum navigation performance standards that aircraft must meet in order to operate in MNPS-designated airspace. In addition, aircraft must be certified by the State of Registry for MNPS operation. The objective of MNPS is to ensure the safe separation of aircraft and to derive maximum benefit, generally through reduced separation standards, from the improvement in accuracy of navigation equipment developed in recent years. (North Atlantic International General Aviation Operations Manual)

MNPSA

Minimum Navigation Performance Specification Airspace. A portion of the North Atlantic airspace between FL275 and FL400 extending between latitude 27° North and the North Pole, bounded in the east by the eastern boundaries of control areas Santa Maria Oceanic, Shanwick Oceanic and Reykjavik, and in the west by the western boundary of Reykjavik control area, the western boundary of Gander Oceanic control area and the western boundary of New York Oceanic control area excluding the area west of 60° West and south of 3830° North. (North Atlantic International General Aviation Operations Manual)

Mode C

Altitude-reporting mode of secondary radar used with AT-CRBS transponders. Requirements for when transponders are needed are found in FAR Section 91.215.

Mode S

Discrete, addressable secondary radar system that may also include data link.

MRO

Maintenance Repair Order. Order received from customer for repair or replacement.

National Airspace System

The common network of U.S. airspace; navigation aids; communication facilities; aeronautical charts and information; rules, regulations, and procedures; technical information; and FAA manpower and material. Included are system components shared jointly with the military. In addition to all designated airspace, the system includes the following components: air navigation facilities and airports.

NASA

National Aeronautics and Space Administration

NASAO

National Association of State Aviation Officials

NAT

North Atlantic Airspace

NAT/SPG

North Atlantic/Special Planning Group. An ICAO group consisting of countries that abut the North Atlantic and of users of the North Atlantic.

NATA

National Air Transportation Association

NBAA

National Business Aviation Association. Founded in 1947, NBAA is the leading organization for companies that rely on general aviation aircraft to help make their businesses more efficient, productive and successful. NBAA is a member of the International Business Aviation Council, Ltd.

NDB

Nondirectional Radio Beacon (FAR Section 1.2)

NFDC

National Flight Data Center. A facility in Washington, DC, established by the FAA to operate a central aeronautical information service for the collection, validation and dissemination of aeronautical data in support of the activities of government, industry and the aviation community. The information is published in the National Flight Data Digest. (Airman's Information Manual)

NFDD

National Flight Data Digest. A daily (except weekends and federal holidays) publication of flight information appropriate to aeronautical charts, aeronautical publications, notices to airmen or other media serving the purpose of providing operational flight data essential to safe and efficient aircraft operations. (Airman's Information Manual)

Noise Abatement

Procedure for aircraft operating at an airport so as to minimize the impact of noise on the local environment. NBAA's Noise Abatement Program is a set of objectives and operating procedures used to reduce noise exposure for people on the ground. The procedures, established in 1967, are recommended as a standard for all aircraft whose manufacturers have not recommended specific noise-abatement procedures.

Noise Contour

Continuous line on a map of an airport and its vicinity that connects points of the same noise exposure level

NOPAC

North Pacific Airspace

NOTAM

Notice to Airmen. A notice containing information (not known sufficiently in advance to publicize by other means) concerning the establishment, condition or change in any component (facility, service, or procedure of, or hazard in the National Airspace System), the timely knowledge of which is essential to personnel concerned with flight operations.

- NOTAM(D) – A NOTAM given (in addition to local dissemination) distant dissemination beyond the area of responsibility of the flight service station. These NOTAMs are stored and available until canceled.
- FDC NOTAM – A NOTAM regulatory in nature, transmitted by USNOF and given system-wide dissemination.

Notice of Proposed Certificate Action

The required notice given to a certificate holder of the FAA's intention to order the suspension or revocation of a certificate. This notice is not required if an emergency order is issued. Regulations on certificate actions are found in FAR Section 13.19. (FAA Order 2150.3A)

NPIAS

National Plan of Integrated Airport Systems

NTIS

National Technical Information Service

NTSB

National Transportation Safety Board

OAC

Oceanic Area Control Center. Any Area Control Center (ACC) with jurisdiction over oceanic airspace for the purpose of providing Air Traffic Services. Responsibility for the provisions of Air Traffic Services is delegated to various countries based primarily upon geographic proximity and the availability of the required resources. (North Atlantic International General Aviation Operations Manual)

OAG

Official Airline Guide

Oceanic Airspace

Airspace over the high seas, for which ICAO delegates responsibility for the provision of ATS to various countries.

Omega

Network of eight very-low-frequency stations located around the world that provides navigational signals normally used in conjunction with a very low frequency (VLF) system for long-range point to point navigation over remote areas.

100-Hour Inspection

An inspection of a commercially operated aircraft required by FAR Section 91.409 within each 100 hours time in service in accordance with procedures prescribed by the FAA.

Open Skies Policy

Concept that promotes unrestricted use of airspace and airports by all users.

Operator

Any person who causes or authorizes the operations of an aircraft, such as the owner, lessee or bailee of an aircraft. (NTSB Section 830.2)

OSHA

Occupational Safety and Health Administration

OTS

Organized Track System. A movable system of oceanic tracks that traverses the North Atlantic between Europe and North America. The physical position is determined twice daily to take advantage of the winds aloft. (Airman's Information Manual)

PAMA

Professional Aviation Maintenance Association

PANS

Procedure for Air Navigation Services

PAR

Precision Approach Radar (FAR Section 1.2). Radar equipment in some air traffic control facilities operated by the FAA and/or the military services at joint-use civil/military locations and separate military installations to detect and display azimuth, elevation and range of aircraft on final approach course to a runway. (Airman's Information Manual)

Payload

The weight an aircraft can carry including passengers, fuel, cargo and baggage.

PIC

Pilot In Command. The pilot responsible for the operation and safety of an aircraft during flight time. (FAR Section 1.1)

PMA

Parts Manufacturer Approval. An approval necessary for a manufacturer to produce a modification or replacement on a type certificated product. Requirements are found in FAR Section 21.303.

PMI

Principal Maintenance Inspector

POI

Principal Operations Inspector

PPE

Pilot Proficiency Examiner

Preventive Maintenance

Simple or minor preservation operations and the replacement of small standard parts not involving complex assembly operations (FAR Section 1.1). Paragraph (c) of Appendix A of FAR Part 43 lists work that falls under preventive maintenance.

PRNAV

Precision Area Navigation. RNAV that meets a track-keeping accuracy equal to or better than ± 1 nm for 95 percent of the flight time.

Proficiency Check

A check given by a check airman to flightcrew members to test the ability of the pilot in specific situations and maneuvers. Commercial requirements are found in FAR Section 135.297. Non-commercial requirements are found in FAR Section 61.58.

Progressive Inspection

A continuing sequential airworthiness inspection of an aircraft and its various components and systems at scheduled intervals in accordance with procedures approved by the FAA. Approval requirements are found in FAR Section 91.409.

Propeller

A device for propelling an aircraft that has blades on an engine-driven shaft and that, when rotated, produces a thrust approximately perpendicular to its plane of rotation. It includes control components normally supplied by its

manufacturer, but does not include main and auxiliary rotors or rotating airfoils of engines. (FAR Section 1.1)

PSI

Principal Security Inspector.

RAA

Regional Airline Association

RAC

Rules of the Air and Traffic Services

Recurrent Training

The training required for crewmembers to remain adequately trained and currently proficient for each aircraft, position and type of operation in which the crewmember serves.

Reliever Airport

An airport to serve general aviation aircraft that might otherwise use a congested air carrier served airport.

Report of Violation

A report made under FAR Section 13.1 by any person who knows of a violation of the Federal Aviation Act of 1958, as amended, the Hazardous Materials Transportation Act relating to the transportation and shipment by air of hazardous materials, the Airport and Airway Development Act of 1982, as amended by the Airport and Airway Safety and Capacity Expansion Act of 1987, or any rule, regulation, or order issued thereunder to the appropriate personnel at any FAA regional or district office.

Reservation

An authorization received in compliance with FAR Part 93, to operate to and/or from a designated high density traffic airport (HDTA). A reservation is normally allocated on an hourly basis. However, the total hourly reservation limit could be further broken down to a 30-minute time period limit. A reservation flight may operate only within the approved hour or half hour, unless the flight encounters a traffic delay. (Advisory Circular 90-43G)

RNAV

Area Navigation System. A method of navigation that permits aircraft operations on any desired course within the coverage of station-referenced navigation signals or within the limits of self-contained system capability. (FAR Section 1.1)

RNP

Required Navigational Performance is the specified navigation capability necessary for aircraft to operate within a defined airspace. RNP capabilities of the aircraft are based on its navigational accuracy within the horizontal plane.

RNP/AR

Required Navigation Performance/Authorization Required. A type of approach or departure with a specified required level of performance and capability that requires special aircraft certification and aircrew training. Procedures may include radius-to-fix (RF) legs.

RTCA

RTCA, Inc. is a private, not-for-profit corporation that develops consensus-based recommendations regarding communications, navigation, surveillance and air traffic management (CNS/ATM) system issues. RTCA functions as a Federal Advisory Committee. Its recommendations are used by the FAA as the basis for policy, program and regulatory decisions and by the private sector as the basis for development, investment and other business decisions.

Runway Incursion

Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and takeoff of aircraft.

RVSM

Reduced Vertical Separation Minima (RVSM) reduces the vertical separation between flight level (FL) 290–410 from 2,000 feet to 1,000 feet and makes six additional FLs available for operation. The additional FLs enable more aircraft to fly more time/fuel efficient profiles and provides the potential for enhanced airspace capacity. RVSM operators must receive authorization from the appropriate civil aviation authority. RVSM aircraft must meet required equipment and altitude-keeping performance standards. Operators must operate in accordance with RVSM policies/procedures applicable to the airspace where they are flying.

RVR

Runway Visual Range. An instrumentally derived value, based on standard calibrations, that represents the horizontal distance a pilot will see down the runway from the approach end. It is based on the sighting of either high intensity runway lights or on the visual contrast of other targets whichever yields the greater visual range. (Airman's Information Manual)

SARP

Standards and Recommended Practices (ICAO)

SENEL

Single Event Noise Exposure Limit expressed in dBA

Serious Injury

An injury that (1) requires hospitalization for more than 48 hours, commencing within 7 days after the date the injury was received; (2) results in a fracture of any bone (except simple fractures of fingers, toes, or nose); (3) causes severe hemorrhages, nerve, muscle, or tendon damage; (4) involves any internal organ; or (5) involves second- or third-degree burns or any burns affecting more than 5 percent of the body surface. (NTSB Section 830.2)

SID

Standard Instrument Departure. A pre-planned IFR air traffic control departure procedure printed for pilot use in graphic and/or textual form. It provides transition from the terminal

to the appropriate en route structure. (Airman's Information Manual) There are two types of SIDs:

- Air Traffic Control (ATC) SIDs that are intended to maximize traffic flow efficiencies for ATC
- Obstacle Departure Procedure (ODP) SIDs that are designed to separate departing aircraft from known obstacles via TERPs designs

SIFL

Standard Industry Fare Level. An airline industry statistic maintained by the Department of Transportation, which includes specific cents-per-mile rates for three different ranges of statute mileage and a fixed terminal charge.

SITA

Société Internationale de Télécommunications Aéronautiques

Small Aircraft

An aircraft with a maximum gross weight of 12,500 pounds or less (FAR Section 1.1)

SMIR

Standard Manufacturing Inspection Representative

SOP

Standard Operating Procedure

SPG

Special Planning Group (ICAO)

Stage

(1) In turbine engine construction, a single turbine wheel having a number of turbine blades.

(2) In aircraft certification, the delineation of the various certificate noise levels and airplanes that meet those noise levels.

Stage 1/Chapter 1

The lowest of the three aircraft noise classes created in 1977, when the FAA amended FAR Part 36 to provide for three levels of aircraft noise certification standards.

Stage 2/Chapter 2

The noise limit for newly designed large aircraft imposed in 1973 following the establishment of the FAA's first noise regulation – FAR Part 36. The international (ICAO) equivalent noise standard is known as ICAO Chapter 2.

Stage 3/Chapter 3

A more stringent aircraft noise limit that applied to aircraft for which new type certificates were applied for on or after November 5, 1975. This category of noise certification was created in 1977, when the FAA amended FAR Part 36 to provide for three stages of aircraft noise levels. The international (ICAO) equivalent noise standard is known as ICAO Chapter 3.

Stage 4/Chapter 4

The most recent and most stringent aircraft noise certification limit that applies to aircraft for which new type certificates are applied for on or after January 1, 2006. The international equivalent noise standard is known as ICAO Chapter 4.

STAR

Standard Terminal Arrival procedure. A pre-planned IFR air traffic control arrival procedure published for pilot use in graphic and/or textual form. It provides transition from the en route structure to an outer fix or an instrument approach fix/arrival waypoint in the terminal area. (Airman's Information Manual)

STC

Supplemental Type Certificate. A certificate authorizing an alteration to an airframe, engine or component that has been granted an Approved Type Certificate. The procedures for the issuance and changes to supplemental type certificates are found in FAR Part 21 – Certification and Procedures for Products and Parts.

STMP

Special Traffic Management Program. Reservation program implemented to regulate arrivals and/or departures at airports that are in areas hosting special events of national significance. STMPs may or may not include airport slot reservations.

STOL

Short Takeoff and Landing

Substantial Damage

Damage or failure that adversely affects the structural strength, performance or flight characteristics of the aircraft, and that normally would require major repair or replacement of the affected component. The following are not considered "substantial damage" for the purpose of notification and reporting of aircraft accidents or incidents: engine failure or damage limited to the engine if only one engine fails or is damaged, bent fairings or cowling, dented skin, small puncture holes in the skin or fabric, ground damage to rotor or propeller blades and damage to landing gear, wheels, tires, flaps, engine accessories, brakes or wing tips. (NTSB Section 830.2)

SVS

Synthetic Vision System. A system used to create a synthetic image representing the environment external to the aircraft that is derived from aircraft altitude, high-precision navigation information and a database of terrain, obstacles and relevant cultural features.

TBO

Time Before Overhaul. A recommendation of the manufacturer of an aircraft engine as to the amount of time that the engine can operate under average conditions before it

should be overhauled. Overhaul at this time will result in the most economical operation.

TC

Type Certificate. The official specifications of an aircraft, engine or propeller. These are issued by the FAA and the device, in order to be airworthy, must conform to these specifications. The procedures for the issuance and changes to type certificates are found in FAR Part 21 – Certification and Procedures for Products and Parts.

T&C

Terms and Conditions (of a purchase)

Temporary Use of Substitute Aircraft

An insurance policy clause that enables an insured to use another non-owned aircraft of similar type, horsepower, and seating capacity for such a time that the insured's aircraft is being repaired or serviced.

Time Change Item

Any item, component, unit, etc., whose time in service is limited by hours, number of times the unit is operated on, or a calendar basis, and must be removed and replaced with a new or serviceable like item.

Time In Service

In regard to maintenance records, the time from the moment an aircraft leaves the surface of the earth until it touches it at the next point of landing.

TRACON

Terminal Radar Approach Control

Transition Training

The training required for crewmembers who have qualified and served in the same capacity on another airplane of the same group.

TSO

Technical Standard Order. An order issued by the FAA that is a minimum performance standard for specified articles (i.e., materials, parts, processes or appliances) used on civil aircraft. (FAR Section 21.601(b))

Turbine-Powered Airplanes

This includes turbofan, turbojet, prop fan and ultra-high-bypass fan-powered airplanes, but specifically excludes turbopropeller-powered airplanes equipped with variable-pitch, constant-speed propellers. (Advisory Circular 120-50)

Type (of Aircraft)

A specific classification of aircraft having the same basic design including all modifications which might result in a change in handling or flight characteristics.

Type Certificate Data Sheets

The official specifications of an aircraft, engine or propeller. They are issued by the FAA and the device, in order to be airworthy, must conform to these specifications.

Type Rating

An additional rating to a pilot's certification that authorizes the pilot to act as pilot in command of a specific aircraft. A list of aircraft that require a type rating in order for a pilot to act as pilot in command is found in Advisory Circular 61-89D.

UDF

Un-Ducted Prop Fan

UIR

Upper Flight Information Region

Unscheduled Operation

An operation other than one regularly conducted by an air carrier or commuter between a high density airport and another service point. Certain types of air carrier/commuter operations are also considered as unscheduled. They include irregular charter and hired aircraft service and non-passenger flights. (Advisory Circular 90-43F)

Upgrade Training

The training required for crewmembers who have qualified as second-in-command or flight engineer on a particular airplane type, before they serve as pilot in command or second-in-command, respectively, on that airplane.

VASI

Visual Approach Slope Indicators

VLJ

Very Light Jet

VFR

Visual Flight Rules

VOR

Very High Frequency Omnidirectional Radio Range (FAR Section 1.1)

VORTAC

Integrated VOR and Tactical Air Navigation (TACAN), navigational devices that provide azimuth and distance-measuring capability.

Whole Aircraft In-House Flight Department

See aircraft resourcing options.

Whole Aircraft Management Company

See aircraft resourcing options.

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NBAA MEMBERSHIP

Introduction

For over 60 years, the business aviation community has looked to NBAA as its leader in enhancing safety and security, shaping public policy, providing world-renowned industry events and advancing the business aviation goals of 8,000 Member Companies worldwide.

As our Association has grown through the years, so too have the needs of our diverse Membership. Whether it's finding an answer to a technical operations question, needing a forum for networking with business aviation buyers or wanting to stay current on the latest industry news and regulations, NBAA provides something for everyone. From flight departments – large and small – to suppliers in the industry, we work to represent the interests of the business aviation community at large, and to provide the resources needed to help our Member Companies succeed.

As a valued NBAA Member, we want to be sure that you are taking full advantage of all the numerous resources we offer. Our comprehensive benefits and services provide you with the tools you need to learn about operational, technical and legislative issues, stay on top of regulatory requirements and changes, improve your management skills, network with peers, become involved with your local, national and international business aviation communities, make yourself heard by government at all levels, advance your career and help your business succeed – or in other words, do your job.

Here is an overview of some of our key Member benefits, to remind you of the NBAA resources you have at your fingertips – whatever your needs may be.

ACCESS TO INDUSTRY EXPERTS

» DID YOU KNOW

The team of industry experts in NBAA's Operations Service Group provides Members with instant access to the latest information on rules and regulations, certifications and training requirements, equipment and service innovations, and other aspects of our dynamic and ever-changing industry.

With a single phone call or e-mail, Members have access to a designated staff person for prompt answers to questions on thousands of topics, including waiver requests, access protocols, customs regulations, technical questions, FAA regulations and more. www.nbaa.org/osg

Contact (9:00 a.m. – 5:00 p.m. ET)

- (202) 783-9250
- info@nbaa.org

NBAA MEMBERS ALSO CAN FIND THE ANSWERS THEY NEED THROUGH:

NBAA Committees. Made up of committed, talented and knowledgeable volunteers, NBAA's standing committees work together on behalf of the NBAA Membership to promote business aviation safety and technical standards, access, professional development, operational excellence and security. NBAA's Technical Committee alone offers 11 subcommittees that obtain and evaluate data concerning aircraft, aircraft equipment, operations and maintenance problems relative to the business aircraft owner and pilot. These technical subcommittees strive to bring about improvements in aircraft, equipment and operations, while maintaining flying safety at its highest level. For any standing committee, NBAA Members can contact the committee chair or staff liaison with questions.

www.nbaa.org/committees

LEARN MORE AT WWW.NBAA.ORG

SAFETY

» DID YOU KNOW

NBAA partners with the FAA and NTSB to co-host the annual Bombardier **Safety Standdown**.

NBAA and its Member Companies are committed to making business aviation as safe as possible. By supporting Safety Standdown, NBAA advances and expands business aviation's safety message. Through a multi-day event focused on improving business aviation safety, the Safety Standdown brings aircraft operators together with safety experts in the industry and government for a series of education sessions.

Integrating knowledge-based training with skill-based training, the sessions focus on a variety of safety-related topics. These include medical training, in-flight fire fighting, aircraft evacuations on land and in water, high-altitude physiology (hypoxia), fatigue countermeasures, runway incursions, icing and use of airborne weather radar.

All participants receive a completion certificate, and are eligible to receive continuing education credits from Embry-Riddle Aeronautical University, National Test Pilot School and NBAA's Certified Aviation Manager (CAM) Program.

The Safety Standdown offers relevant and timely safety information, which is at the very foundation of business aviation.

www.safetystanddown.com

Additional Safety Information

- **Single-Pilot Safety Standdown.** In partnership with Cessna, NBAA offers the annual Single-Pilot Safety Standdown to promote high standards of safety for single pilots. The event features an entire day of safety programming for owner/operators and single pilots, including sessions on professional airmanship, single pilot resource management, icing, aviation health and fatigue countermeasures.
- **Corporate Aviation Safety Seminar (CASS).** This seminar provides a forum for discussion and review of safety matters that are the focus of the business aviation community. Co-sponsored by the Flight Safety Foundation (FSF) and NBAA, CASS draws more than 400 Attendees and features aviation industry leaders, government representatives and university researchers.
- **NBAA Flying Safety Awards.** These awards have brought worldwide attention to the business aircraft safety record and have been endorsed and approved by the National Safety Council. They are awarded annually and recognize the safety records compiled by Member Company management, maintenance, pilot and support personnel teams.
- **NBAA Prototypical Safety Manual.** This manual was created to assist the Membership in developing or refining a formal safety program. Both flight and ground safety programs necessary to reduce risk in a business aviation organization are identified. These programs are prototypes only and each organization should tailor its own safety program to its own specific needs. (Available online only.)
- **NBAA ALAR Training Aid.** NBAA has developed this interactive, 90-minute training program for business aviation pilots, based on the Flight Safety Foundation's Approach-and-Landing Accident Reduction (ALAR) Tool Kit.



LEARN MORE AT WWW.NBAA.ORG/SAFETY

RESOURCES FOR FLIGHT DEPARTMENT OPERATIONS

» DID YOU KNOW

NBAA maintains one of only two non-FAA desks at the FAA Air Traffic Control System Command Center. This General Aviation (GA) Desk provides Members with the tools and information they need to enhance trip planning and facilitate issue resolution. These NBAA staff members afford a voice for equitable representation of business aviation in the planning and execution of the daily strategic plan of operations for the National Airspace System. They participate in real-time national airspace flow-control and decision-making, as well as long-term strategic planning for the aviation industry as part of a joint FAA/Industry Collaborative Decision Making Workgroup. The GA Desk represents the interests of NBAA Members as part of their dues, but additional GA Desk services are available to Members on a subscription basis.

www.nbaa.org/gadesk

The GA Desk also offers a free subscription to NBAA Airspace Alerts, available to Members only. These e-mail alerts provide the single best source of information about upcoming temporary flight restrictions (TFRs) and other airspace issues that have a significant impact on NBAA Member flight operations. www.nbaa.org/airspace/alerts

Additional Resources

- **APIS Transmission Service.** Through a partnership with ARINC Direct Business Aviation Solutions, NBAA is offering Members a cost effective solution for complying with Customs and Border Protection (CBP) Advance Passenger Information System (APIS) regulations that require operators to electronically submit passenger and aircraft information in advance of international flights. The service provides many value-added features that are not available to operators utilizing the APIS service offered by CBP. www.nbaa.org/apis
- **Insurance Plans and Workers' Comp.** All employees of Member Companies qualify for NBAA-endorsed Term Life Insurance, and Member pilots also qualify for Disability Loss-of-License Insurance. Additionally, all flight department personnel can access Workers' Compensation Insurance coverage at reduced rates. Participating companies even have the opportunity to earn a cash dividend through the program. Contact your existing broker to learn more. www.nbaa.org/workerscomp
- **NBAA's Business Aviation Taxes Seminars and Tax, Regulatory & Risk Management Conference.** These events provide participants with comprehensive information and a solid basis for understanding how the appropriate tax laws and regulations apply to business aviation operators, along with a broad overview of financial risk management and aviation insurance. www.nbaa.org/events/date
- **NBAA Oceanic Flying Operations and Procedures Manual.** This resource provides Members with a comprehensive reference source for oceanic and inter-continental flight operations. It is a compendium of U.S., ICAO and other national documents, both regulatory and advisory, and provides a basic primer for those performing or intending to perform international flight operations. www.nbaa.org/publications
- **Additional Operations References Online**
www.nbaa.org/ops



BENEFITS FOR LIGHT BUSINESS AIRPLANE OWNER-OPERATORS AND PILOTS

» DID YOU KNOW

NBAA Has a Small Aircraft Exemption?

Do you ever have a need to carry passengers and property, and charge for the flight? Or to enter into timesharing, interchange, and joint ownership agreements? Do you need to conduct demonstration flights and receive compensation?

Since 1972, operators of small aircraft for business purposes have relied on **NBAA's Small Aircraft Exemption** to do just that. These include all piston aircraft, helicopter and turbine aircraft (single-engine or under 12,500 lbs.) operators, provided they are NBAA Members.

Operators of large and turbine-powered multi-engine airplanes have had this flexibility through the Federal Aviation Regulations, but small aircraft had been excluded. However, NBAA's Small Aircraft Exemption allows operators of small aircraft, including all helicopters (regardless of size), to operate under regulations originally established for large aircraft.



To take advantage of NBAA's Small Aircraft Exemption, you must be an NBAA Member. www.nbaa.org/exemption

More NBAA Resources to Help Light Business Airplane (LBA) Users

- **Insurance.** Providing such programs as Term Life Insurance and Loss-of-License Insurance, NBAA offers its Members access to competitively priced insurance options. www.nbaa.org/admin/insurance
- **Aircraft Transactions.** The benefits of business aviation are clear, but researching an airplane purchase can be daunting. How do companies decide which airplane will best meet their business needs? NBAA's *LBA Buyer's Guide* provides a synopsis of the offerings currently available in the light business airplane category to assist companies in their purchase planning. www.nbaa.org/lba-buyers-guide
- **Aircraft Utilization.** Owner-flown aircraft can provide companies with all of the efficiency, productivity, and financial benefits that can be realized with business aviation. An NBAA resource titled *How to Use Your Airplane for Business* outlines key advantages for both employees and employers to utilizing owner-flown aircraft for their business, offers advice for employees seeking to convince their employers of the benefits of using owner-flown aircraft, and provides guidance developing a company policy covering the use of owner-flown aircraft. www.nbaa.org/business

LEGISLATIVE & REGULATORY ADVOCACY

As everyone in business aviation knows, our industry is facing unprecedented challenges. From harmful security proposals and discriminatory access restrictions, to public misperceptions and onerous user fees – NBAA Members are weathering one of the worst economic storms general aviation has ever seen. And as our industry tries to grapple with the impact of a flagging economy on their businesses, the policy challenges coming out of Washington appear no less daunting.

NBAA is the leading organization advocating for the business aviation community, representing the industry before Congress, government agencies, the courts and international forums to be sure your voice is heard regarding policies affecting your business. NBAA works diligently to protect the interests of its Members, by aggressively educating government officials about the critical importance of business aviation to local communities, and by advocating for policies that recognize the central role business aviation plays in our nation's economy.

DID YOU KNOW

Your Membership investment in NBAA backs programs that:

- Protect your access to airports and airspace
- Alert the TSA and Congress to the detrimental impact of new security proposals, and promote a reasonable outcome
- Combat negative media attention by educating the public and government on why business aviation is essential to our nation's economy
- Prevent new and onerous operational user fees
- Partner with the government in modernizing the nation's airspace system and expanding capacity
- Work with Congress to develop reasonable and balanced policies that support the industry's twin objectives of promoting mobility, while minimizing its environmental footprint.

LEARN MORE AT WWW.NBAA.ORG/GOV

Online Advocacy Center provides the tools and resources you need to stay informed, and get directly involved in the issues that concern you most. www.nbaa.org/advocacy

Contact Congress is a tool that allows Members to communicate with their congressional representatives, by helping them generate and send personalized letters to Congress quickly and easily online.

www.nbaa.org/action

NBAA's Regional Representatives work on behalf of six U.S. regions, leveraging the presence of business aviation in every state and city to support the industry and help articulate its views on airport policies, environmental protocols, safety and security proposals, taxation and a variety of other issues. These NBAA staff members also support and participate in more than 70 regional business aviation groups nationwide, and work to directly address Member needs out in the field. www.nbaa.org/advocacy/regional



NETWORKING



You probably already know about **NBAA's Annual Meeting & Convention**, the single best networking forum in business aviation throughout the year, attracting 25,000 buyers and sellers to one comprehensive three-day event. But if you're looking for additional ways to network with your peers throughout the year –

» DID YOU KNOW

NBAA offers Members-only e-mail listservs called **Air Mail**, giving you access to thousands of your peers 24/7. Connect with a network of business aviation professionals to get instant answers to all of your questions, and exchange knowledge on topics from industry best practices to airport and aircraft improvements, from air traffic control and navigation to fuel allocations, FBOs and more.

Air Mail includes more than 30 lists focused on specific business aviation topics, such as business aircraft pilots, maintenance, scheduling and dispatching, fractional ownership, business aviation jobs and more. Thousands of subscribers use Air Mail to network and share the wealth of knowledge available within the business aviation community.

www.nbaa.org/airmail

Other Networking Opportunities

- **NBAA Business Aviation Regional Forums.** Network with your peers at the local level throughout the year at our Regional Forums. Held in various cities throughout the country, these events feature informative briefings on timely topics, indoor exhibits and outdoor business aircraft displays. Exhibitors and Attendees can meet with sales prospects and colleagues who share concerns and ideas relative to their particular geographic region.
www.nbaa.org/forums
- **NBAA Member Directory.** The most comprehensive source of business aviation resources in the industry, this networking tool is available only online, giving NBAA Members access to thousands of business aviation professionals on a global scale – in real time, 24/7.
www.nbaa.org/directory
- Keeping your Membership record up-to-date is easy with *My NBAA Profile* – NBAA's online profile tool.
www.nbaa.org/mynbaa

CONVENTIONS



»» DID YOU KNOW

NBAA's Annual Meeting & Convention ranks in the top five largest U.S. trade shows. The 64th Annual Meeting & Convention (NBAA2011) will be held in Las Vegas, NV from October 10 to 12, 2011. This premier business aviation event is the largest, most efficient gathering of buyers and sellers in the business aviation industry, and often the only opportunity during the year to do direct side-by-side comparisons of nearly every product and service available to company flight departments. It is also the industry's leading venue for new product announcements and introductions, and features over 100 business aircraft in the Static Display of Aircraft.

This event also features dozens of top-rated education sessions, unmatched professional networking, presentations on the latest products and services, and access to 25,000 of your peers. www.nbaa.org/events/amc

NBAA Is Also a Leading Forum for Business Aviation on a Global Scale

- **European Business Aviation Convention & Exhibition (EBACE).** The only European exhibition to focus exclusively on business aviation, EBACE is organized jointly by NBAA and the European Business Aviation Association (EBAA). With over 11,000 Attendees, EBACE offers a wide range of programs, resulting in a highly-concentrated learning experience for all who attend – including business aircraft operators, policymakers, regulators, opinion leaders, members of the media and technology leaders in the business aviation industry. www.ebace.aero
- **Asian Business Aviation Conference & Exhibition (ABACE).** Marking the much-anticipated return of the first and most successful trade show in Asia dedicated solely to business aviation, ABACE will be held from February 28 to March 1, 2012, at the Hongqiao Airport in Shanghai, China. The event will be held at the new Shanghai Hawker Pacific Business Aviation Center and include exhibits in the facility's 4,000 square-meter hangar, a Static Display of Aircraft outside on its expansive ramp, and on-site education sessions led by industry veterans with knowledge of the region's business and regulatory environment. www.abace.aero

LEARN MORE AT WWW.NBAA.ORG/EVENTS

NBAA EVENTS CALENDAR

2011–2012

JUNE

June 3	Business Aviation Taxes Seminar • San Francisco, CA
June 8	Business Aviation Regional Forum • White Plains, NY
June 9–10	Business Aircraft Transactions Conference • New York, NY
June 13–14	PDP Course: Flight Operations Manual Workshop • San Diego, CA
June 15–16	PDP Course: Management Fundamentals for Flight Departments Workshop • San Diego, CA
June 16–18	16th Annual Flight Attendants/Flight Technicians Conference • San Diego, CA
June 21–23	Introduction to SMS Workshop • Seattle, WA

JULY

July 14	Business Aviation Regional Forum • San Jose, CA
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OCTOBER

October 8	PDP Course: Enhancing Productivity Through Business Aviation • Las Vegas, CA
October 8–9	PDP Course: Emergency Response Planning Workshop • Las Vegas, CA
October 8–9	PDP Course: Management Fundamentals for Flight Departments Workshop • Las Vegas, CA
October 8–9	PDP Course: Introduction to Aviation Safety Management System • Las Vegas, CA
October 9	PDP Course: Highly Effective Teams at Work • Las Vegas, CA
October 10–12	64th Annual Meeting & Convention (NBAA2011) • Las Vegas, CA
October 13–14	PDP Course: Flight Operations Manual Workshop • Las Vegas, CA
October 13–14	Tax, Regulatory & Risk Management Conference • Las Vegas, CA

JANUARY

January 15–18	23rd Annual Schedulers & Dispatchers Conference • San Diego, CA
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FEBRUARY

February 28 – March 1	Asian Business Aviation Conference & Exhibition (ABACE2012) • Shanghai, China
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MAY

May 22–24	European Business Aviation Convention & Exhibition (EBACE2012) • Geneva, Switzerland
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Current as of May 2011

REVIEW THE FULL EVENTS CALENDAR AT WWW.NBAA.ORG/EVENTS/DATE

EDUCATION & CAREER DEVELOPMENT

DID YOU KNOW

NBAA offers a comprehensive program of seminars for flight department personnel and others involved in business aviation operations. All job functions are covered, including schedulers, dispatchers, flight attendants, maintenance managers, technicians, chief pilots, aviation department managers, accountants and attorneys.

NBAA's seminars address current industry trends and issues, as well as basic hands-on information key for the successful day-to-day operation of the business aviation flight department. Such events include the Schedulers & Dispatchers Conference; Maintenance Management Conference; Flight Attendants/Flight Technicians Conference; Flight Operations Manual Workshop; Emergency Response Planning Workshop and more. www.nbaa.org/events

On-Demand Education

NBAA On-Demand Education offerings provide point-and-click access to the information business aviation professionals need to ascend in their careers. Live and archived webinars are available, as well as session recordings from NBAA conventions and seminars. Courses are available in two formats: online as a pay-per-view product, or via video CD-ROM. Both online and CD programs include supporting PowerPoint slides that are conveniently synchronized to the overall presentation.

www.nbaa.org/ondemand



Other Programs

- **Business Aviation Jobs.** Whether you need to find a job or fill a job, NBAA can help. The Association's Business Aviation Jobs career center resource is designed to make it easier for business aviation professionals to find the newest available positions and gain greater exposure to hiring companies. In turn, companies are able to post openings to NBAA's Business Aviation Jobs site to find the most qualified people in the industry to fill their positions. www.nbaa.org/jobs
- **Professional Development Program (PDP).** In cooperation with the University Aviation Association (UAA), NBAA developed this program to prepare business aviation professionals for management roles within flight departments, covering such topics as business management, leadership, operations, personnel management, and technical and facilities services. NBAA also offers SPDP, an offshoot professional development program to meet the needs of schedulers and dispatchers. www.nbaa.org/pdp
- **Certified Aviation Manager (CAM) Program.** This program recognizes excellence within the field of business aviation, and is designed to raise the quality of management within flight departments. Through certification, individuals can gain recognition and credibility within the industry, and show that they are professionals committed to the management, safety and security of business aviation. www.nbaa.org/cam

LEARN MORE AT WWW.NBAA.ORG/EDUCATION

DEDICATED TO HELPING BUSINESS ACHIEVE ITS HIGHEST GOALS.



CERTIFIED AVIATION MANAGER

Committed to Excellence, Prepared to Lead

www.nbaa.org/cam



BUSINESS MANAGEMENT

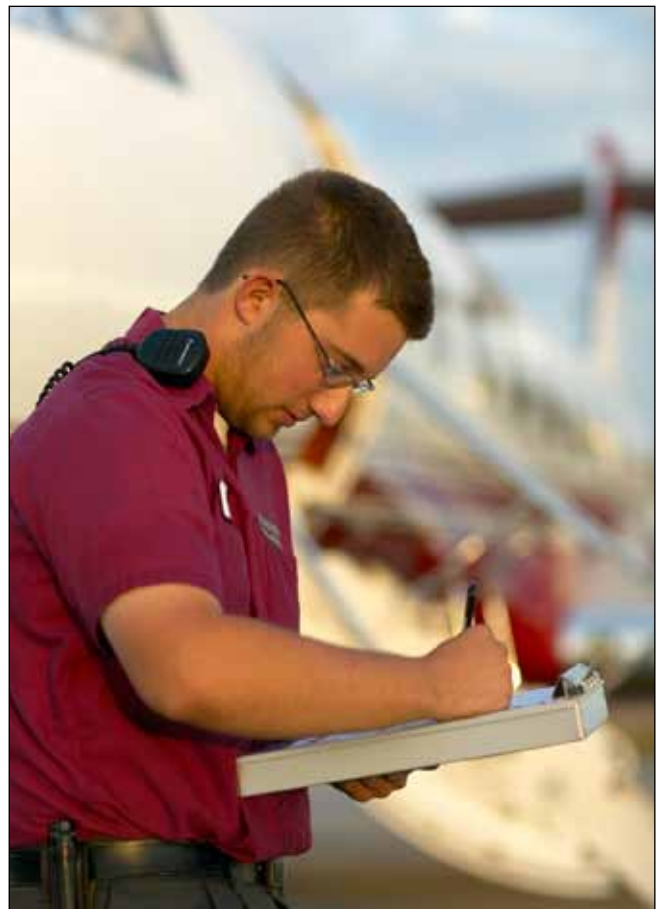
» DID YOU KNOW

The *NBAA Management Guide* is an industry standard, and a must-have for any size flight department. This guide is designed to assist existing flight departments with their operational, maintenance and administrative requirements.

Much of the information contained in the guide is often used as reference materials to educate non-aviation company personnel on accepted practices and norms of the business aviation community, so it's a publication no business aviation manager should be without. Order printed copies or download PDF copies for your company's employees via NBAA's secure online order form. www.nbaa.org/management-guide

Other NBAA Business Management Tools

- **NBAA Compensation & Benchmark Survey.** This secure web-based survey provides a comprehensive review of aviation department personnel salaries and operational data, and is an excellent tool for industry benchmarking. It is accessible to Members only and is free to participating companies. www.nbaa.org/admin/cbs
- **NBAA's Leadership Conference.** This annual event offers the latest information on business aviation management and maintenance topics, such as attracting and retaining qualified flight department members, personnel management, cost accounting, record keeping, human factors and FAA regulations. www.nbaa.org/leadership
- **Aeromedical Benefit.** NBAA has partnered with Virtual Flight Surgeons, Inc. to offer Members an exclusive 10 percent discount on the Complete Aeromedical Services Program (CASP). CASP offers a comprehensive approach, providing unlimited services for an annual per pilot fee. www.aviationmedicine.com
- **Shipping Program.** NBAA has teamed up with Partnership® to offer exclusive shipping discounts to all NBAA Members, regardless of size or Member type. NBAA Members that enroll will receive significant discounts on every FedEx shipment sent or received, for small packages up to large LTL freight shipments. It's free to participate in this Members-only program, and there are no minimum shipping requirements or obligations. www.nbaa.org/shipping



LEARN MORE AT WWW.NBAA.ORG/ADMIN

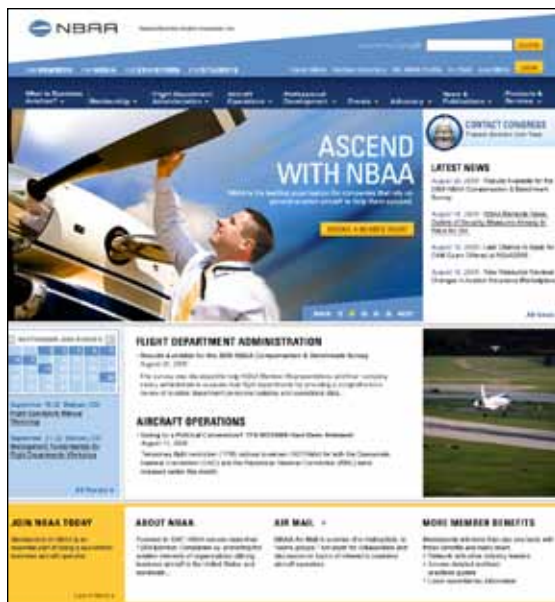
THE LATEST INFORMATION

DID YOU KNOW

Business Aviation Insider, the official Member publication of NBAA, is exclusive to Members only. This publication arrives in Members' mailboxes bimonthly, featuring operational tips and tools, regulatory hot topics and the latest industry news that affects you and your business. All Member Company employees are eligible for their own free subscriptions, and may request them by updating their communications preferences online via the My NBAA Profile tool. www.nbaa.org/insider

NBAA Members also can find the comprehensive information they need through:

- **NBAA's Web Site.** The most comprehensive online source for business aviation information, www.nbaa.org provides invaluable information, much of which only Members can access. Find products and services information, as well as for news and resources about flight department administration, aircraft operations, professional development, advocacy and more. Members can access the information they need 24/7, and with only a few clicks of their mouse. www.nbaa.org
- **NBAA Update.** Newly redesigned for 2011, this weekly e-newsletter is better than ever before, providing a synopsis of the latest operational, regulatory and political news for the business aviation community. It's also a great resource to get the latest information about the Association and upcoming NBAA events. www.nbaa.org/update



LEARN MORE AT WWW.NBAA.ORG/NEWS

NBAA CHARITIES

» DID YOU KNOW

Through the years, NBAA has been a leader in giving back to the business aviation community. **NBAA Charities** supports a wide range of philanthropic organizations and initiatives that use general aviation airplanes for humanitarian purposes, including Angel Flight, Corporate Angel Network and the Veterans Airlift Command. www.nbaa.org/charities

- **NBAA/CAN Charity Benefit With Live and Silent Auctions.** The sole beneficiary of NBAA's Charity Benefit is Corporate Angel Network (CAN), a charitable organization that eases the burden of travel for cancer patients by arranging free flights to treatment centers using empty seats on business aircraft. Featuring Live and Silent Auctions of aviation-themed items, the Charity Benefit is held in conjunction with NBAA's Annual Meeting & Convention.
- **NBAA Chairman's Charity Classic.** Also held in conjunction with the NBAA Annual Meeting & Convention, this popular golf tournament raises funds to benefit NBAA Charities. Since the tournament was founded in 1997, it has raised over \$400,000.

[Angel Flight](#)

[Veterans Airlift Command](#)

[Corporate Angel Network](#)

[And more!](#)



[LEARN MORE AT WWW.NBAA.ORG/CHARITIES](http://www.nbaa.org/charities)

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