U. S. Department
of Transportation

**Federal Aviation
Administration**

DESIGNEE NEWSLETTER

Northwest Mountain Region

Aircraft Certification Division
Transport Airplane Certification Directorate

Edition 7; June 1, 1988

IMPACT 88 Under Way

By now, most of you have heard of *IMPACT 88*, but may not be aware of its objectives. The program was outlined initially by FAA Administrator Allan McArtor at his formal swearing-in ceremony on July 27, 1987, and expanded upon at subsequent public forums and meetings with agency employees.

As the name indicates, *IMPACT 88* is designed to yield positive payoffs during the current fiscal year that not only will enhance aviation safety and security, but also serve to restore public confidence in our air transportation system. As the Administrator has stated, "We must take immediate measures to demonstrate progress to a doubting public."

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Specifically, *IMPACT 88* will focus on:

- **AIRCREW PERFORMANCE**
- **AIRLINE ACCOUNTABILITY**
- **AIRPORT DEVELOPMENT**
- **AIRSPACE CAPACITY**
- **ADVANCED TECHNOLOGY**
- **AVIATION AWARENESS**
- **AIR TRANSPORTATION SECURITY**
- **AGENCY EFFECTIVENESS**

Despite *IMPACT 88*'s emphasis on early payoffs, it should not be viewed strictly as a short-term, quick-fix program. Rather, it represents short to long range efforts that will carry over into succeeding Administrations. As McArtor explains, "I want to leave a legacy of continued modernization that any future Administrator can pick up and adopt with pride."

Details of *IMPACT 88* still are evolving and will continue to do so in the months ahead. The major objectives of the program follow.

AIRCREW PERFORMANCE

As one of his first actions, the Administrator met with the chief of pilots of the scheduled carriers in Kansas City to begin the discussion on crew coordination and professionalism. As a result, the FAA and industry have formed a joint task force to look at both human factors and crew training and the relationship between the two.

NORTHWEST MOUNTAIN REGION
DESIGNEE NEWSLETTER

(Published semiannually; 7th edition)

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Through emphasis on human factors research, we will expedite efforts already underway to assess the impact on crew performance of recent changes in cockpit automation, standardization and environment. The FAA/Industry task force will identify and showcase existing cockpit resource management programs to heighten pilot awareness and increase professionalism.

In the training area, the agency and industry will also conduct a top-to-bottom review of pilot training programs and regulations. The goal is to produce recommendations to improve pilot and cockpit training programs and also update the rules. This will be the first major revision since the introduction of turbojet aircraft. FAA also will pursue rulemaking to require windshear training, the carriage of airborne windshear equipment, as well as training and carriage of the Traffic Alert and Collision Avoidance System (TCAS II).

• AIRLINE ACCOUNTABILITY

The primary purpose of this initiative is to elevate safety and service awareness in the corporate boardroom. In his speech before the Aero Club, McArtor said, "I'm not saying that our airline executives are not mindful of their service obligations. I'm asking them to prove they are. Show us that the same care and accountability which go into company financial statements extend to the aircraft maintenance and operation programs."

As a first step, the agency will develop a "how to" self-inspection manual to assist airlines in identifying and correcting problems. Procedures for sharing information must also be developed with the goal of making the reporting of problems and solutions an incentive for the industry. This shared information could be very useful to the traveling public and to the agency for safety analyses.

• AIRPORT DEVELOPMENT

FAA will take a national system approach to airport development by providing Federal leadership and technical assistance to spur construction of new airports and modernization and expansion of existing facilities.

The Administrator has established an executive level action team which met on September 28 to begin developing a national plan for building new airports and expanding and modernizing existing ones.

The team will incorporate into the final plan studies already underway within the agency, including recommendations on aircraft noise and airport capacity.

In addition, FAA plans to provide direct technical assistance to state and local airport plan-

ners and develop a computer model of traffic demand that projects aircraft flow patterns for the entire airport/airspace system.

- **AIRSPACE CAPACITY**

The focus of this initiative is to enhance national airspace system technology, to investigate the need for regulatory action, and to expand information on system limitations.

The areas for possible regulatory actions include the need for additional positive control airspace, terminal control areas and Mode C transponder requirements. FAA will also pursue the second phase of the Expanded East Coast Plan and develop similar plans for the West Coast and Midwest. Technology initiatives include implementation of Aircraft Situation Displays, Mode C "Intruder" software in the enroute centers, and enhanced terminal conflict alert software at selected TRACONS.

- **ADVANCED TECHNOLOGY**

Work in this area will focus on airborne-and ground-based enhancements, as well as development of new concepts. Efforts include accelerated development of the more sophisticated Traffic Alert and Collision Avoidance System (TCAS III), test and evaluation of Automatic Dependent Surveillance (ADS) satellite technology, and development of ATC applications of Mode S data link.

Longer range projects include global positioning system integration, creation of a capability within the agency to apply expert systems and artificial intelligence to ATC problems, and development of agency plans for air traffic control in the 21st century.

- **AVIATION AWARENESS**

In spite of aviation's excellent safety record, public confidence in the air transportation system has been shaken by media reports of near midair collisions, operational errors, flight delays, and poor airline service. This has led to conjecture about "declining safety margins." To recapture the public trust, FAA will improve external communications, elevate public understanding of FAA and its mission, and publicize on-going programs which improve safety, security and service.

A key element in this initiative is a public affairs and aviation education strategy focused on shaping positive aviation awareness to the public and media. FAA needs to take its campaign to the people--to schools, talk shows, civic centers-- and explain why American aviation is central to this country's global competitiveness.

Equally important, the Administrator wants to develop a "Dow Jones of aviation safety" that would give the public a balanced picture of the air transportation system. These new safety indices would provide a more accurate assessment of the state of aviation safety.

- **AIR TRANSPORTATION SECURITY**

Terrorist activity around the world underscores the continued need for strengthening airline and airport security plans. FAA is also working to improve the preboard passenger screening system through the development of incentive programs and recognition for screeners; new technology for increased detection rates; and improved procedures for controlling access to sterile areas. Other initiatives involve hosting an International Aviation Security Conference in October

1988 and establishing a Civil Aviation Security National Inspection Plan for airports.

- **AGENCY EFFECTIVENESS**

This program endorses greater FAA autonomy in such areas as procurement, executive personnel development and selections and rulemaking. With greater FAA autonomy will come greater accountability on the part of agency managers to achieve the agency's goals and objectives. Among the human resource initiatives, FAA will continue to press for hiring additional controllers to keep pace with projected traffic growth. We are also looking to expedite and improve the recruitment and hiring process, and are undertaking a top-to-bottom review of training.

The success of *IMPACT 88* depends on all FAA employees as the agents of change in the system. In his July 27 speech, McArtor said, "I have great confidence that the people of the FAA will respond to the challenges of the coming year to improve air transportation for the American public."

Advisory Circulars

The following is a list of Advisory Circulars (AC) recently issued by FAA. To obtain copies, contact the Department of Transportation, Subsequent Distribution Unit, M-494.3, Washington, D.C. 20590.

AC 20-128: *Design Considerations for Minimizing Hazards Caused by Uncontained Turbine Engine and Auxiliary Power Unit Rotor and Fan Blade Failures*, dated March 9, 1988, sets forth a method of compliance with the requirements of Sections 23.903(b)(1), 25.901(d), and 25.903(d)(1) of the FAR pertaining to design precautions taken to minimize the hazards to an airplane in the event of uncontained engine or auxiliary power unit rotor (compressor and turbine) failure and engine fan blade failures.

Proposed Advisory Circulars

AC 25.807: *Uniform Distribution of Exits.* On February 8, 1988, a notice was published in the Federal Register inviting public comment on a proposed AC that provides guidance material for acceptable means of demonstrating compliance with the requirements for distributing required passenger emergency exits uniformly. This AC will address only those passenger-carrying airplanes, including mixed passenger/cargo configurations, with a type certification basis of Amendment 25-15 or later with respect to Section 25.807(c) or airplanes with an earlier type certification basis, required by Section 25.2 to meet Section 25.807, Amendment 25-15. The public comment period closes on June 7, 1988.

AC 25.803: *Emergency Evacuation Demonstrations.* On February 8, 1988, a notice was published in the Federal Register inviting public comment on a proposed AC that provides guidance on a means of compliance with the FAR concerning: (1) conduct of full-scale emergency evacuation demonstrations, and (2) use of analysis and tests for emergency evacuation demonstrations in lieu of conducting an actual demonstration. The public comment period closes on June 7, 1988.

AC No. 20-XX: *Powerplant Installation and Propulsion System Component Fire Protection*

Test Methods, Standards, and Criteria. A notice inviting public comment on this proposed AC was published in the Federal Register on March 22, 1988. This AC provides acceptable test methods, standards, and criteria to be used in demonstrating compliance with the fire protection requirements specified in Part 25 regulations applicable to powerplant installations and propulsion system components, including APU installations and ancillary equipment. The public comment period closes July 20, 1988.

Notices

Notice 88-5: *Improved Structural Requirements for Pressurized Cabins and Compartments in Transport Category Airplanes*, was issued on March 1988. This notice proposes to amend Part 25 of the FAR to upgrade the structural requirements for transport category airplane pressurized cabins by (1) amending the criteria for evaluation of the secondary vessel and (2) extending the area of consideration to include openings anywhere within the pressure vessel. The required opening sizes to be considered would not be changed. This proposal is a result of an FAA review of the pressurized cabin load requirements, and is intended to make the pressurized cabin load requirements less design-depending and more objective. It would require evaluation of openings in any pressurized compartment and examination of the effects of differential pressure loads on any critical structure inside or outside the pressurized cabin. The notice appeared in the Federal Register on March 16, 1988. The public comment period closes on July 14, 1988.

Notice 87-13: *Standards for Approval of a Reduced V1 Methodology for Takeoff on Wet and Contaminated Runways*, was issued November 20, 1987. This notice proposes amendments to Parts 25, 121, and 135 to add new standards for transport category airplanes which would provide for approval of a reduced takeoff decision speed (V_1) methodology for takeoff on wet and contaminated runways. Reduced braking friction as a result of a wet runway condition was a contributing factor in numerous rejected takeoff accidents. This proposal to lower V_1 by allowing a reduced clearance over the end of the runway (screen height) would provide an increase in safety for rejected takeoffs on wet contaminated runways. Notice 87-13 was published in the Federal Register on November 30, 1987. The public comment period closed March 30, 1988.

Technical Standard Orders (TSO)

The Office of Airworthiness in FAA Headquarters recently issued the following TSO's to reflect technological advances in aeronautics:

TSO-C34e: *ILS Glide Slope Receiving Equipment Operating within the Radio Frequency Range of 328.6-335.4 MHz*, Revision e, dated January 15, 1988, prescribes the minimum performance standards identified in RTCA DO-192, "Minimum Operational Performance Standards for Airborne ILS Glide Slope Receiving Equipment Operating within the Radio Frequency Range of 328.6-335.4 MHz." RTCA DO-192 incorporates as a reference RTCA DO-160B. RTCA DO-178A has been defined for the use of software verification.

TSO-C36e: *Airborne ILS Localizer Receiving Equipment Operating within the Radio Frequency Range of 108-112*, Revision e, dated January 25, 1988, prescribes the minimum performance standards identified in RTCA DO-195, "Minimum Operational Performance Standards for Airborne ILS Localizer Receiving Equipment Operating within the Radio Frequency Range of 108-112 MHz," dated November 1986. RTCA DO-195 incorporates as a reference RTCA DO-160B. RTCA DO-178A has been defined for the use of software verification.

TSO-C39b: *Aircraft Seats and Berths*, Revision b, dated April 17, 1987, includes fire blocking requirements with an additional marking and data submittal requirement.

TSO-C40c: *VOR Receiving Equipment Operating within the Radio Frequency Range of 108-117.95 MHz*, Revision c, dated January 25, 1988, prescribes the minimum performance standards identified in RTCA DO196, "Minimum Operational Performance Standards for Airborne VOR Receiving Equipment Operating within the Radio Frequency Range of 108-117.95 MHz," dated November 1986. RTCA DO-196 incorporates as a reference RTCA DO-160B. RTCA DO-178A has been defined for the use of software verification.

TSO-C72c: *Individual Flotation Devices*, Revision c, dated February 19, 1987, includes fire blocking requirements with an additional marking and data submittal requirement.

TSO-C90b: *Cargo Pallets, Nets and Containers*, Revision b, dated January 20, 1988, prescribes the minimum performance standards identified in NAS 3610, Revision 8, "Cargo Unit Load Devices - Specification for," dated February 19, 1987.

TSO-C101: *Over Speed Warning Instruments.* This new TSO prescribes the minimum performance standards set forth in AS 8007, "Minimum Safe Performance Over Speed Warning Instruments," dated February 1978. The environmental standards in RTCA DO-160B are to be used in lieu of RTCA DO-160A. RTCA DO-178A has been defined for the use of software verification.

TSO-C106: *Air Data Computer.* This new TSO prescribes the minimum performance standards set forth in AS 8002, "Air DATA Computer - Minimum Performance Standard," dated October 30, 1981. The environmental standards in RTCA DO-160B are to be used in lieu of RTCA DO-160A. RTCA DO-178A has been defined for the use of software verification.

TSO-C114: *Torso Restraint Systems.* This new TSO prescribes the minimum performance standards set forth in AS 8043, "Aircraft Torso Restraint System," dated March 1986. Environmental standards have been set forth by the American Society for Testing Materials, and test methods have been set forth by the American Association of Textile Chemist and Colorists standards.

TSO-C120: *Airborne Area Navigation Equipment using Omega/VLF Inputs.* This new TSO prescribes the minimum performance standards set forth in RTCA DO-190, "Minimum Operational Performance Standards for Airborne Area Navigation Equipment Using Omega/VLF Input," dated May 1986. RTCA DO-190 incorporates as a reference RTCA DO-160B. RTCA DO-178A has been defined for the use of software verification.

Cancellations

TSO-C12c: *Life Rafts (Twin Tube).* This TSO has been superseded by TSO-C70a, Liferafts (reversible and nonreversible). This cancellation was announced in the Federal Register, Vol. 53 No. 27, dated February 10, 1988.

To obtain a copy of any of the TSO's listed above, write to: Federal Aviation Administration, Office of Airworthiness, Aircraft Engineering Division (AWS-100), 800 Independence Avenue, S.W., Washington, D.C. 20591.

Designation Renewal

A Designated Engineering Representative's (DER) designation expires annually and must be either renewed or terminated for cause. The cause could be any of the following:

1. DER services are no longer needed by FAA, as evidenced insufficient DER activity.

2. The DER becomes an employee of a Designated Alteration Station (DAS) --see below;

3. The company terminates the DER's employment; or

4. Continued integrity is not found in the DER's work or communications.

Anytime a DER changes his status, i.e., changes his base of operation, leaves the employ of the manufacturer who requested his appointment, etc., he must notify the cognizant FAA regional offices so that the records may be kept current, and to ensure the proper flow of correspondence.

In FAR Part 21, Subpart M, the regulations on eligibility require that the DAS must have a staff including qualified engineering personnel. Since DER's are well-qualified, it is evident that their knowledge and experience would be valuable for a DAS. A DER should recognize, however, that his engineering activities as a DER and as a member of the engineering staff of a DAS are considered by the FAA to be separate and independent functions. The DAS authorization and the designation of a DER are distinct and separate authorizations and no provisions exist for the utilization of engineers who exercise their DER authorizations as members of a DAS staff. Therefore, if a DER becomes an employee of a DAS and no longer engages in activities as a DER outside this employment, his authorization will not be renewed, since continuing his appointment would serve no purpose.

Independent DER's

The FAA Advisory Circular 183.29-IV will now list phone numbers for independent DER's. Any change in address or phone number should be reported to the FAA as soon as possible, so that these changes can be made through Washington, D.C. headquarters in a timely manner.

Operation SNAPSHOT

On September 21, 1987, FAA Administrator McArtor announced that, as

one of the initiatives for his *IMPACT 88* program, he has directed the Office of Airworthiness to conduct a national safety inspection of FAA production approval holders [i.e., Production Certificates (PC), Approved Production Inspection Systems (APIS), Technical Standard Order Authorizations (TSOA), and FAA Parts Manufacture Approvals (FAA-PMA)]. He stated that this initiative is not based on any known problems in the aircraft manufacturing industry, but that it is based on the need for a fresh look at the civil aircraft manufacturing environment (FAA and industry), due to:

1. rapid changes in technology, such as automated factories, composite material, Computer Aided Design/Computer Aided Manufacturing (CAD/CAM), and software;

2. the internationalization of the industry, such as co-production agreements, multinational programs, and the increased use of domestic and foreign suppliers by production approval holders;

3. new concepts in marketing, such as offset agreements which are frequently used to enhance sales of aircraft and related products to foreign countries; and

4. public concerns about aviation safety-related issues.

This National Safety Inspection Program (dubbed *Operation SNAPSHOT*), expected to last from 15 to 18 months, consists of a comprehensive in-depth evaluation of today's manufacturing environment. The result of this inspection effort will eventually be assessed to determine if:

1. FAA production approval and surveillance methods are adequate and effective in today's environment;

2. FAA guidance material needs to be amended or revised; and

3. significant trends are present or emerging which may impact safety and require further study or investigation.

Operation SNAPSHOT is an ambitious, knowledge-oriented program in which the data gathered will provide an overview of the civil aircraft manufacturing industry. As part of the program, a data base will be set up that will be used to determine what actions the FAA needs to take to ensure the efficacy of its certificate management program in the ever-changing deregulated environment.

Twenty-nine facility inspections have been completed as of March 1, 1988. A target rate of eleven per month has been set for the second quarter of Fiscal Year 1988.

Three TCAS Systems Being Developed

The FAA is developing a family of Traffic Alert and Collision Avoidance (TCAS) systems that will help prevent midair collisions. A cockpit-based system that will be independent of the ground-based air traffic control system, TCAS will have three basic designs. TCAS I and II are planned for use by different classes of aircraft. TCAS III will be an enhancement of TCAS II.

TCAS I, the least expensive and least sophisticated system, will alert pilots that another aircraft is too close to them. The TCAS unit

will also indicate the relative position of the other aircraft by displaying a "traffic advisory" on a cockpit display screen. The traffic advisory will include the range, altitude, and bearing of the intruder, enabling the pilot to take evasive action.

TCAS I equipment will be installed in low and medium performance general aviation aircraft and in turbine-powered aircraft with 10-19 passenger seats.

The TCAS II and TCAS III systems will provide pilots with the same traffic advisories as TCAS I, but they will also furnish "resolution advisories." A resolution advisory will instruct the pilot to climb or descend, or to bear left or right, to avoid a collision. TCAS II equipment will be able to issue only the vertical advisory, while TCAS II will be able to issue both horizontal and vertical resolution advisories.

TCAS II and III units will be installed in all transport aircraft flown by air carriers, and in turbine-powered aircraft with more than 20 passenger seats flown by air taxis and commercial operators.

The FAA, two avionics manufacturers, and two major airlines are collaborating on flight tests of the TCAS II system. At the same time, FAA personnel at the Technical Center are conducting flight tests on experimental TCAS III units. When the final TCAS III systems are built, they too will be installed in airline planes for real-time flight tests.

(See additional article on this same subject, entitled "Update on FAA Plans for the Traffic Alert and Collision Avoidance System (TCAS)," which appears elsewhere in this edition.)

Form 8110-3: Alteration and Repair Approvals

During a recent designee conference, questions were raised as to how DERs should specify the purpose on the Form 8110-3 when approving design data relative to major changes, major alterations, and major repairs. Questions were also raised concerning the process to be used when supporting repair stations with data approval on major repairs.

A major change to the type design of a "product" is governed by the certification procedures of FAR 21 and, in general, requires a supplemental type certificate.

Major alterations and major repairs to approved "products" are specifically covered by FAR 43 maintenance and alteration rules.

FAA Order 8110.4, Type Certification, chapter 5, paragraph 199b(2), specifies in part that

> "The FAA Form 8110-3 should, in each case, outline the nature and extent of the designee's approval. The designee should take every step to assure that the FAA is advised which portions of those data or other related data he has not examined and/or approved, in order that no gaps will exist in an investigation of compliance with all pertinent requirements."

Recently some repair stations and Flight Standards inspectors have expressed concern about DERs including the words "in support of a field approval," on form 8110-3 approving design data in support of major alterations and repairs. The words "field approval" imply that some portion of the data will be approved by an FAA inspector and obligate the repair station to seek approval from the Flight Standards office responsible for monitoring the repair station. Repair station personnel stated that Flight Standards in-

spectors are not always available when an airplane is ready for return to service under the authorities granted in FAR 43.3, 43.7, 65.95, 145.51, 121.379, 127.140, and 135.437.

Furthermore, repair station personnel have contended that an approval by a Flight Standards inspector is not required for a major repair, and that the repair station has the authority to approve the major repair as a normal result of returning the aircraft to service.

A DER can support a major alteration or repair only with a design approval on FAA Form 8110-3. It should be noted on the Form 8110-3 that approval is design approval and not installation approval. DERs do not fill in or sign FAA Form 337's.

Nonetheless, FAA Order 8110.37, chapter 2, paragraph 13b(2) reads in part:

> "FAA approval of a repair or alteration cannot be given without physical accomplishment of the work and without a satisfactory inspection; hence, an aircraft must be available. The approval is granted by FAA inspection personnel or their authorized representatives."

Repair agencies and authorized persons (AI) working within certificate limitations are authorized to approve aircraft for return to service when related design data is FAA approved. It is conceivable that a DER's 8110-3 could constitute design approval for the alteration or repair, and the aircraft could be returned to service without the need of involving a Flight Standards inspector, or the "field approval" procedures.

DERs should help to assure that all appropriate areas of data approval are covered, particularly when no FAA employee is involved in the data or installation approval. DERs can do this by clearly specifying which technical areas they are approving and what is to be installed.

Considering all the above, DERs are advised to:

1. Follow FAA Order 8110.37, chapter 2, paragraph 13, with respect to repairs and alterations;

2. When approving design data in support of major alterations, show on the Form 8110-3 that the purpose is in support of a major alteration and that the approval does not constitute installation approval; and

3. When approving design data in support of a major repair, show on the Form 8110-3 that the purpose is in support of a major repair and that the approval is design approval only and not installation approval.

This does not alter instructions or procedures contained in the DER Guidance Handbook Order 8110.37, the Airworthiness Inspector's Handbook Order 8300.9, or any other FAA order. This information is intended to supplement those orders and will be considered for incorporation into national orders at a later time.

Please contact your supervising branch manager if you have any questions about these instructions.

Airship Design Criteria Issued by FAA

The FAA's first formal standards for the type certification of airships were issued by the Office of Airworthiness, Policy and

Procedures Branch (AWS-110), in November 1987. The Airship Design Criteria provide airworthiness and design requirements for the type certification of conventional, near-equilibrium, nonrigid airships with up to nine passenger seats.

The FAA has recently received a number of applications for the certification of airships, reflecting a resurgence of interest in lighter-than-air transports.

An Advisory Circular, AC 21.17-1, gives more general guidelines for the type certification of airships. Both the advisory circular and the design criteria describe the safety standards for special classes of aircraft set forth in new Section 21.17(b) of the Federal Aviation Regulations.

FAA Part 25 and Part 121 Forward Observer's Seat Requirements

The requirements for a forward observer's seat are contained in FAR Sections 25.785(k), 121.581(a), 125.317(b), and 135.75(b).

In the FAR 121, 125, and 135 rules, there is no specific list of required equipment for the first observer's seat, but rather a general statement that the required equipment would be "determined by the Administrator." The Flight Standards Division considers a representative of the Administrator, occupying the first observer's seat and performing official duties, to be a required crewmember. This designation also applies to company check airmen, or any other personnel performing official duties relating to the performance of the crew or operation of the airplane. This person would be expected to interact with the captain and other flight crewmembers, in addition to his normal duties relating to enroute inspection and surveillance. For these reasons, it is important that the occupant of the observer seat be provided with the equipment necessary to perform his function, i.e., oxygen, protective breathing equipment, and communication via a radio and interphone panel, which is the same type equipment provided to the flightcrew.

FAR 25.785(k) does not specify what type of equipment must be provided to the observer seat as part of the type design, requiring only that the seat "be shown to be suitable for use in conducting enroute inspections prescribed by FAA 121.581(a)." The intent of FAR 25.785(k) applies to any observer's seat required by the operating rules, even though only FAR 121.581(a) is referenced. FAR 25.785(k) has been interpreted to allow the use of passenger-type oxygen equipment, provided that the airplane in question is not to be used in FAR 121, 125, or 135 operation. If the airplane is to be so used, the oxygen, communication, and protective breathing requirements stated above must be provided. If the airplane is not to be used in FAR 121, 125, or 135 operation (i.e., in FAR 91 operation), installation of either type of oxygen equipment at the first observer's seat is adequate to show compliance with the requirements of FAR 25.1441, Oxygen Equipment and Supply, and installation of communication equipment and protective breathing equipment would be optional. The duration of oxygen supply should be commensurate with the crew supply, since protection may be necessary due to a delayed descent following decompression, protective breathing requirements, or other extended usage.

Flammability Standards for Cabin Interior Materials

Questions have been raised concerning the new flammability standards for cabin interior materials, specifically the issue of what constitutes a "substantially complete replacement of cabin interior components. . .," as contained in FAR Section 121.312(a)(5) and (6). Those subparagraphs generally apply only when all of the components subject to Section 25.853(a-1), i.e., interior ceiling and wall panels (other than lighting lenses), partitions, and the outer surfaces of galleys, large cabinets, and certain stowage compartments, are replaced. The qualifying term "substantially complete" is used, however, to ensure that persons cannot circumvent the intent of the rule by replacing all but a small, insignificant portion of the components. Generally, there would be a complete replacement of the interior if all but a few units of the affected components were replaced. For example, compliance with the new standards would be required if all of the components subject to Section 25.853(a-1), except a few sidewall panels, were replaced or if all but a few storage bins were replaced. It is not possible to precisely define "few units" because the number will vary with the total number of units in the airplane and the relative size of the units.

A related issue is the applicability of the rule to components rotated among airplanes. Interior components that are removed, refurbished, and reinstalled in the same airplane would not, by definition, be "replaced." Because they would not be replaced, those components would not be required to meet the new standards regardless of whether they constitute all, or essentially all, of the cabin interior components subject to Section 25.853(a-1). If, on the other hand, the refurbished components installed in the airplane are not those removed earlier from that airplane, the components removed from that airplane have, by definition, been replaced.

The fact that certain components have been "replaced" does not mean, in itself, that the newly installed components have to meet the new standards. As discussed above, whether the components that "replace" the removed components have to meet the new standards depends on whether there is an "essentially complete replacement" of the cabin interior components.

The FAA has received a number of inquiries as to the issue of which specific interior components are subject to Section 25.853(a-1). We do plan to develop material that provides guidance concerning which items in the cabin have to comply with the new standards and which items do not.

A new final rule on the subject of flammability of cabin interior materials is expected to be published imminently in the Federal Register.

Flap Settings: Clarification

Page 13 of the December 7, 1987, Designee Newsletter (Edition 6) contained an article entitled "Flap Settings." This article explained circumstances when an unapproved flap setting could be used for emergencies. Apparently, some readers were confused and erroneously concluded that "placard" and "softguard" devices may be used to gain approval for the emergency use of a flap setting and/or a gross weight limit that was not previously approved.

The "placard" and "softguard" procedure has been used in instances where the flap design was originally believed to meet all the applicable airworthiness and noise standards. However, it was later determined that the maximum landing flap configuration of two transport models did not meet the Part 25 handling qualities criteria. In other instances, the maximum landing flap did not comply with the more recent noise standards. For these airplanes, it was desirable to maintain the maximum landing flap configuration for emergency use, and a "softguard" and/or placard was employed as a restriction. In all cases, the flap system design met the structural requirements of Part 25, and continued to do so under the modified approval that involved placards and "softguards."

Since publication of the December 1987 Designee Newsletter, the "softguard" policy has been broadened. The previous policy **recommends** that a "softguard" be used for these special approvals. Current policy **requires** use of a "softguard" for a Part 36, Stage 3, airplane that cannot demonstrate Stage 3 compliance at a flap setting that was previously approved and is being maintained for emergency use only.

Turbojet Thrust Reverser Policy: FAR Part 25.933(a)

It has come to our attention that some confusion exists as to what is required to show compliance with FAR 25.933(a). The confusion relates to the tests and analyses required for a ground-only operating turbojet thrust reversing system to show compliance with FAR 25.933(a)(1), (a)(2), and 25.1585(a)(9). These regulations require that a thrust reverser deployed in flight must be restowed if the reverser is undamaged and operable, and when it is damaged to the extent it cannot be restowed, then a safe flight and landing must be accomplished. Information and instructions regarding restowing or continuing flight and landing with the reverser unstowed must be furnished in the Airplane Flight Manual (AFM).

- **DESIGN REQUIREMENTS**

It must be shown by structural analysis that deployment of the reverser at speeds up to V_{MO}/M_{MO} does not result in structural damage or deformation that would preclude restowing the reverser at an acceptable airspeed determined from flight testing.

The thrust reverser control system must be designed such that, with any single failure, unintentional deployment is not possible. The design should permit that preflight failure or pilot action will result in unintended thrust reverser deployment. It is considered that movement by the pilot of the reverse levers to the reverse position through a control barrier is an intentional act and, thus, not subject to the above requirement.

- **FLIGHT TEST REQUIREMENTS**

The service history of thrust reversers has shown that, regardless of design features, invariably a reverser will be deployed in flight, and sometimes damaged to the extent that it is not possible to restow. In consideration of this history, the FAA finds it prudent to develop and define landing procedures for a deployed reverser and procedures for restowing the reverser in flight.

The restow test should be conducted at a reasonable and safe altitude and at an airspeed where the airplane can be safely

controlled. A procedure should be developed so that the reverser can be restowed (if undamaged) safely and without causing unacceptable airplane controllability problems. The restowing procedure, airspeed, and airplane flight controls configuration must be incorporated in the AFM.

Landing with a reverser deployed should be conducted with a flap setting and an airspeed such that a landing can be accomplished safely and consistently. The conditions and operating procedures used when the landing is made with the deployed reverser must be defined and incorporated in the AFM per FAR 25.1585(a)(9).

Type of Operation (FAR Part)	Type of Airplane	Type of TCAS Required	Years*
121	Large Airplanes	TCAS II	3
125	Large Airplanes	TCAS II	3
129	Turbine Powered With 20 to 30 Passengers	TCAS II	4
129	Large Airplanes	TCAS II	4
129	Turbine Powered With 10 to 19 Passengers	TCAS I	5
135	Turbine Powered With 20 to 30 Passengers	TCAS II	4
135	Turbine Powered With 10 to 19 Passengers	TCAS I	5

Years after implementation of TCAS rule when installation is required.

Table 1: *TCAS Installation Requirements*

NRS CORNER

Update on FAA Plans for the Traffic Alert and Collision Avoidance System (TCAS)

by James J. Treacy
National Resource Specialist for
Advanced Avionics/Electrical Systems.

On August 26, 1987, the FAA proposed new regulations which would require the installation of a collision avoidance system in large airplanes and in certain airplanes operated by air carriers, air travel clubs, and other operators for compensation or hire, including foreign air carriers. See Table 1, below, for a summary of these requirements.

Two types of collision avoidance systems were required, TCAS I and TCAS II. Both systems interrogate and process replies from intruder aircraft equipped with transponders.

The design for TCAS I is described in Radio Technical Commission for Aeronautics (RTCA) Document No. RTCA/DO-197 and specifies an alert be provided for all intruder aircraft within 4 nautical miles with information on range, bearing, and altitude (if reported). Currently, there are no systems which have been shown to meet these criteria.

TCAS II is designed to provide a more sophisticated traffic alert and display. In addition, TCAS II provides a vertical escape maneuver to the pilot(s) when an intruder aircraft with an operative altitude reporting transponder is determined to be a potential collision threat. The FAA is working to determine and specify the minimum requirements for TCAS II.

I expect that TCAS II design and installation criteria will be specified in Document No. RTCA/DO-185, Aeronautical Radio

Specification 735, Technical Standard Order (TSO) No. TSO-C119, and a new advisory circular, titled "Airworthiness and Operational Approval of Traffic Alert and Collision Avoidance Systems (TCAS II) and Mode S Transponders." These documents are being developed or updated by the FAA and various industry groups to provide for an acceptable TCAS II design prior to rulemaking action.

Early models of TCAS II manufactured by a Sperry/Dalmo Victor consortium were certificated and later deactivated in a Boeing Model 727 operated by Piedmont Airlines. A preliminary TCAS II manufactured by the Bendix Division of Allied/Signal Corporation was certificated on January 29, 1988, for installation in a Boeing Model 737 and a McDonnell-Douglas DC-8 operated by United Air Lines. An updated version of the Sperry/Dalmo Victor TCAS II is planned for future installation in the Boeing Model 727 and McDonnell Douglas MD-80 airplanes. It was anticipated that an evaluation of these installations in normal airline service would be useful to discover and correct TCAS II design problems. Already, problems found as a result of these installations have improved the TCAS II design criteria. Efforts are proceeding to install the final version of TCAS II in these airplanes to obtain similar data on the updated design.

However, as part of the Airport and Airway Safety and Capacity Expansion Act of 1987 enacted on December 30, 1987, the FAA Administrator is required to develop and complete certification of the TCAS II collision avoidance system by July 1, 1989, and to require by regulation the installation of TCAS II in "... each civil aircraft which has a maximum passenger capacity of more than 30 seats and which is used to provide air transportation of passengers, including intrastate air transportation of passengers." This action will probably result in the design standards for TCAS II being frozen this year. Regardless of other rulemaking action, a regulation will be issued requiring the installation of TCAS II by December 31, 1991, in all aircraft with more than 30 passenger seats operating in the U.S. national airspace. It is expected that this will include foreign aircraft.

The proposed advisory circular, which will be published soon with a 90 day comment period, describes acceptable aural alert and visual display characteristics of the TCAS II and the analyses and tests necessary for system installation. Because of the system complexity and the need for flight tests of the installation, TCAS II equipment should only be installed in accordance with a new or amended Type Certificate or Supplemental Type Certificate. The advisory circular outlines extensive flight testing for the initial installation of each model of TCAS II equipment. This includes the need to demonstrate the proper operation of the TCAS II during simulated near mid air collisions with intruder aircraft equipped with an ATCRBS transponder (Mode A and Mode C replies), Mode-S transponder, and TCAS II. Subsequent installations of the same Model TCAS II in other aircraft types should also include a flight test, but this is primarily to verify the proper operation of the TCAS II as installed by responding to Mode A and Mode C replies from an ATCRBS transponder installed in an intruder aircraft or to a fixed transponder on the ground which replies with an appropriate altitude to simulate an intruder. Particular attention should be given to evaluating the volume of the aural alert in high and low cockpit noise conditions, the bearing accuracy of the traffic display, and

possible adverse effects on other aircraft systems caused by the TCAS II installation.

Because the TCAS II installation also requires the installation of a Mode-S transponder to allow compatible operation with other TCAS II equipped aircraft, the advisory circular describes the appropriate test procedures for evaluating a Mode-S transponder. These are similar to tests described in the transport category airplane flight test guide, Advisory Circular (AC) 25-7, for ATCRBS transponders. Mode-S transponder flight demonstrations may be conducted using existing air traffic controls radar facilities, since ground stations equipped with Mode-S are not currently available. For each U.S. registered aircraft, the aircraft operator must obtain a unique Mode-S code from the FAA Aeronautical Center in Oklahoma City and install the means to provide this code to the Mode-S transponder. This is usually accomplished through a set of grounded connector pins. When installed to support TCAS I operations, top and bottom mounted antennas are required for the Mode-S transponder. When installed alone, only a single bottom mounted antenna is required, but two antennas should be installed, if there are plans to use the data link features of the Mode-S transponder. By regulations issued April 6, 1987 [FAR 91.24, 121.345(c), 127.123(b), and 135.143(c)], Mode-S transponders are effectively required for new transponder installations made after January 1, 1992, and ATCRBS transponders manufactured after January 1, 1990, may not be installed.

In Memoriam

Dennis E. Whitmire, an Aerospace Engineer with the Transport Standards Staff, Aircraft Certification Division, passed away on May 13, 1988, after a bout with cancer. He was 48.

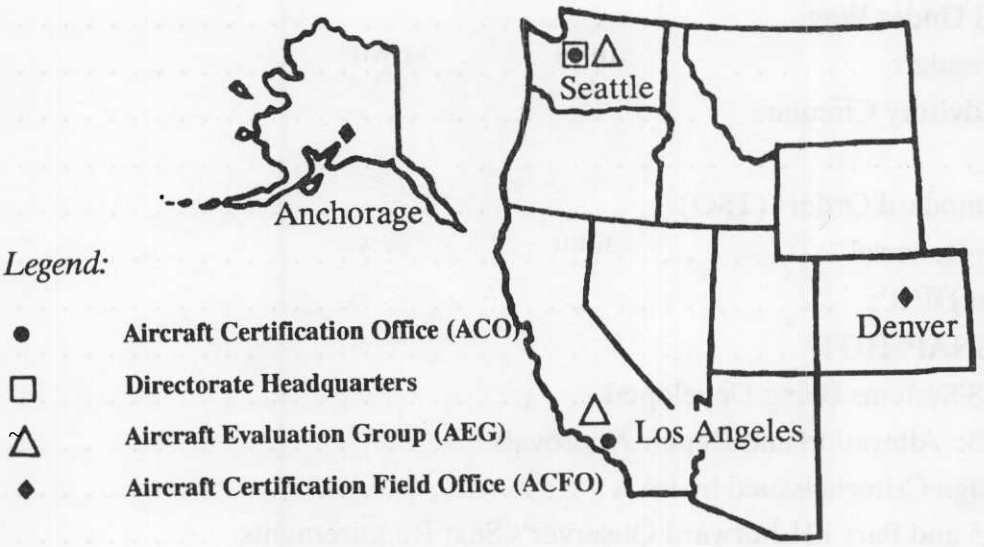
Denny came to the FAA three years ago, after 17 years with the Boeing Company. He specialized in the areas of transport airplane flight testing, performance, and handling qualities.

Despite a heavy workload, Denny always found time to get to know and help other people. He was a member of the Human Relations Committee, Toastmasters, and the Fellowship Group. In his short time with the FAA, he became a special friend to many.

About the time that Denny's leave balances began to run low, new Federal regulations went into effect permitting employees to donate annual leave to coworkers in times of medical emergency. This is a wonderful program which provides, beyond its economic benefit, a means for employees to demonstrate support for each other in times of need. Denny's case was the first use of this program in the Region, and the response was overwhelming. As we implemented the program it was limited to employees at the same or higher grade, and within the same division. Knowing that we could ask for more if needed, we suggested that people initially donate a day or two; but many donated a week, some donated three weeks. Ten days after we announced the program over six months of leave had been donated. While Denny was only able to use a fraction of this gift, it stands as a tribute from his friends who wish they could have done more.

Denny is survived by his wife Donna; daughter, Keri, 17; and son, Brian, 14.

Transport Airplane Certification Directorate



NOTE FROM THE EDITOR

If you would like a copy of any of the previous editions of the Northwest Mountain Region's Designee Newsletter, or if you have a name that you would like added to our mailing list, please submit your request to:

FAA, Northwest Mountain Region
Aircraft Certification Division
ATTN: Editor (DeMarco), ANM-103
17900 Pacific Highway South, C-68966
Seattle, Washington 98168

FAA EMPLOYMENT OPPORTUNITIES

The Northwest Mountain Region Aircraft Certification Division currently has a number of vacancies at the GS-5 through GS-13 levels ($19,654 to $51,354 per annum) for qualified aerospace engineers in the following specialties: airframe, systems and equipment, propulsion, flight test, and modifications.

These positions are located in Long Beach, California, and Seattle, Washington. They require, as a minimum, a B.S. degree in engineering for the GS-5 entry level. Further education and/or certification experience may qualify an applicant for higher grade levels.

If you or anyone you know is interested in form information about FAA employment, please contact:

Federal Aviation Administration
Northwest Mountain Region
Aircraft Certification Division
ATTN: Vicki J. Harrell, ANM-103
17900 Pacific Highway South, C-68966
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