The View from Washington

BY RIC PERI
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This month there are two issues that involve significant elements of technician training. The first issue is built around the maintenance of RVSM approved aircraft. These aircraft and the maintenance of these aircraft are a step up both for aircraft and avionics technicians. The second issue follows years of research, analysis and testing and is part of the proposals coming out of the FAA sanctioned Aging Transport Systems Rulemaking Advisory Committee (ATSRAC).

I routinely receive phone calls regarding the rating and ops specs for adding RVSM aircraft to a repair station's ratings. My response is usually the same: there is no rating or Ops Spec requirement for working on RVSM aircraft. A properly rated repair station is fully capable of working on an RVSM authorized aircraft. The personnel may not be qualified to perform the requisite maintenance, and the test equipment may not meet the degree of calibration required for RVSM equipment, so before the repair station is qualified to work on these aircraft its personnel will need to be RVSM trained and qualified and its equipment calibrated.

However, like all good FAAregulations, there are exceptions to the basic Part 145 requirements. Part 91 and Part 135 operators who have received RVSM authority have a maintenance program that is also approved as part of their RVSM authority. The approved maintenance program may include limitations on who may perform maintenance on the aircraft.

Part 91 requires that the approved RVSM maintenance program outline procedures to maintain RVSM aircraft in accordance with the requirements of Appendix G. Each program must contain periodic inspections, functional flight tests, and maintenance and inspection procedures with acceptable maintenance practices for ensuring continued compliance with the RVSM aircraft requirements. These requirements will normally be included in the FAA approved Instructions for Continued Airworthiness required by either the Original Equipment Manufacturer (OEM) for aircraft which contain the appropriate equipment at initial certification or upgraded by use of an OEM's Service Bulletin. Aircraft upgraded through the criteria of a Supplemental Type Certificate (STC) is also required to prove an FAA approved ICA.

The approved maintenance program must also include a quality assurance program for ensuring continuing accuracy and reliability of test equipment used for testing aircraft to determine compliance with the RVSM aircraft requirements. A properly rated repair station already meets this requirement through Section 145.47 (b) which requires the repair station to ensure that all inspection and test equipment is tested at regular intervals to ensure correct calibration to a standard derived from the National Bureau of Standards or to a standard provided by the equipment manufacturer.

The third requirement of the approved maintenance program is the procedures for returning noncompliant aircraft to service. These procedures will be unique to each aircraft operation and the owner/operator needs to communicate these procedures to the repair station before any work is performed. This should be communicated regardless of whether the maintenance is on RVSM required equipment or general fuselage maintenance.

"There is no rating or Ops Spec requirement for working on RVSM aircraft."

—Ric Peri, AEA Vice President Government & Industry Affairs

But merely being qualified to work on RVSM aircraft doesn't mean that the repair station is competent to work on RVSM aircraft. Competency is a personal and professional requirement of not only the technician but also of the repair station.

Part 65 allows certificated mechanics to perform or supervise the maintenance, preventive maintenance or alteration of an aircraft for which they are rated. However, they may not supervise the maintenance, preventive maintenance, or alteration of, or approve and return to service, any aircraft unless they have satisfactorily performed the work concerned at an earlier date. If they have not so performed that work at an earlier date, they may show their ability to do it by performing it to the satisfaction of the Administrator or under the direct

supervision of a certificated and appropriately rated mechanic, or a certificated repairman, who has had previous experience in the specific operation concerned. Often, this requirement is initially met by attending OEM service schools or other specialized training.

RVSM approved aircraft are different. Although they are typical in their configuration, the maintenance and care of these aircraft are different. And with the new RVSM regulations looming on the horizon, it appears that in the next five years or so, all turbine-powered aircraft will be approved for RVSM flight. What that means for airframe, radio and instrument repair stations is that exposure to RVSM aircraft is probable. RVSM aircraft are different; a normally accepted maintenance task such as simply opening an access panel may compromise the approval of the aircraft to fly in RVSM airspace resulting in a requirement to recertify the aircraft to RVSM standards costing the customer thousands of dollars. If the requirement to recertify the aircraft is required because of a maintenance error on the part of repair station personnel, the repair station will likely have to pay for the recertification and approval of the aircraft.

Examples of maintenance functions that, while not related to avionics, may affect the ability of an aircraft to maintain its RVSM approval include: aircraft painting and/or trim color painting, access panel maintenance, or hangar rash. Maintenance and repair of radomes, fuselage skins and wing leading edge maintenance may also affect skin mapping and certification.

The bottom line is that although the FAA has not mandated specific training for technicians to work on RVSM aircraft, all technicians that may have access to customer's aircraft should have basic education and training on the limitations of working on or around aircraft approved for RVSM flight. And a basic question for all turbine-powered aircraft customers should be: "is the aircraft RVSM approved and does it have an approved RVSM maintenance program?"

Aircraft Wiring

Another pressing issue for technician training is aircraft wiring. For the past four years, the FAA and industry have been addressing the effects of age on aircraft wiring. Following the inspection of 45 various aircraft, it has been determined that age by itself has little effect on aircraft wiring. However, the volume of maintenance that age brings into areas does have an effect on wiring. Well over 80 percent of the concerns raised by the FAA regarding the effect of maintenance on wiring can be mitigated through improved maintenance and inspection techniques and technician training. Improving technician's general inspection methods and improving general maintenance housekeeping procedures to limit debris and other contaminants from aircraft wiring systems will go a long way to improve the longevity of aircraft wiring.

This training should apply to all technicians, airframe, powerplant, and avionics technicians and every technician that may perform maintenance above, below or around aircraft wiring. Aircraft wiring training should include all aspects of aircraft wiring from initial installation to repair and maintenance to include inspection and cleaning.

To address the issues identified in the Aging Systems Plan, in 1998, the FAA established the Aging Transport Systems Rulemaking Advisory Committee (ATSRAC). The ATSRAC was initially tasked in 1998 with five tasks, which included collecting data on aging wiring systems through airplane inspections, reviewing airplane manufacturers' service information, reviewing operators'maintenance programs, and providing the FAA with recommendations to enhance the safety of these systems.

The results and recommendations from the initial tasking indicated that problems associated with systems on aging airplanes were not completely related to the degradation over time of wiring systems. Inadequate installation and maintenance practices can lead to what is commonly referred to as an "aging system" problem. As such, the scope of ATSRAC is not limited solely to age-related issues, but includes improving the continued airworthiness of airplane systems, and in particular, wiring systems.

ATSRAC working group 10, which I participated on, performed a series of detailed inspection of electrical systems on 39 various transport category aircraft. The inspections of these 39 aircraft resulted in a little over 2,000 various squawks. The majority of these squawks were minor discrepancies ranging from minor chaffing and broken clamps to wiring routing discrepancies. The results really didn't lead to any particular pattern of problems, however, overall, the results did indicate that we need to review our wire inspection procedures and what we are using for rejection criteria for identified defects.

The discrepancies found while evaluating the small transport aircraft evaluated by our working group in addition to the original discrepancies found during inspections of large transport category aircraft four years ago generated the concerns of both the FAA and the ATSRAC participants. Most of the concerns of ATSRAC can be satisfied by revisiting AC 43.13-1B ACCEPTABLE METHODS, TECHNIQUES, AND PRACTICES —AIRCRAFT INSPECTION AND REPAIR.

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Chapter 11 covers the general inspection and care of electrical systems. In this chapter the FAA defines electrical systems, describes general maintenance practices and establishes solid inspection criteria with the essential rejection criteria for broken or damaged components.

The term "electrical system" as used in this AC means those parts of the aircraft that generate, distribute, and use electrical energy, including their support and attachments.

The satisfactory performance of an aircraft is dependent upon the continued reliability of the electrical system. Damaged wiring or equipment in an aircraft, regardless of how minor it may appear to be, cannot be tolerated. Reliability of the system is proportional to the amount of maintenance received and the knowledge of those who perform such maintenance. It is, therefore, important that maintenance be accomplished using the best techniques and practices to minimize the possibility of failure. Inspect equipment, electrical assemblies, and wiring installations for damage, general condition, and proper functioning to ensure the continued satisfactory operation of the electrical system.

When the aircraft inspection procedure calls for general inspection of wiring systems, the AC 43.13-1B will provide good guidance on the methods and techniques for conducting visual and detailed inspection of any aircraft wiring system.

So whether you are working on latest generation RVSM compliant equipment or performing a routine inspection on a 30-year-old aircraft, 2003 will be the year of training. Either reemphasizing those skills learned decades ago or learning new skills such as how to work on aircraft with certified skin maps, this year the commitment to aviation training will be obvious. q

Regulatory Update: UNITED STATES

Policy Statement: Corded Electrical Devices Used in the Passenger Cabin

The Federal Aviation Administration (FAA) announced the availability of final policy (ANM-02-115-20) that addresses potential hazards associated with the installation of corded electrical devices used in the passenger cabin.

The final policy was issued in the Transport Airplane Directorate on November 21, 2002.

The policy provides an applicant with various certifications options, which will require little or no on-aircraft evaluation of corded devices, provided that these devices meet certain basic criteria. Examples of corded electrical deices are telephone handsets and video system controllers. This guidance supersedes the previously issued guidance in this area.

Policy Statement: Stowage, Retention, and Breakaway of Deployable Individual Video Systems (IVS) Installed in Transport Airplane Seats

The Federal Aviation Administration (FAA) announced the availability of final policy (ANM-02-115-21) that addresses the use of industry standards in the seat certification process regarding qualification of video systems mounted on seats.

The final policy was issued by the Transport Airplane Directorate on November 21, 2002.

The policy further simplifies the certification process pertaining to the retention of video components on seats for which the supplier has been granted a Technical Standard Order authorization. This policy reduces the regulatory burden on industry by acknowledging the acceptability of test data generated by the seat supplier.

Notice of availability and request for comments regarding the FAA's proposed Advisory Circular (AC) 145-MAN, Guide for Developing and Evaluating Repair Station and Quality Control Manuals

The notice announces the availability of a proposed AC which provides an acceptable means, but not the only means, of developing manuals that are required by regulation for aeronautical repair stations.

Comments about the proposed AC must be received on or before February 5, 2003.

This proposed AC is the result of an amendment to part 145 of Title 14, Code of Federal Regulations (14 CFR), published in the Federal Register on August 6, 2001. The final rule changed procedures and requirements for aeronautical repair stations and requires repair stations to develop a repair station manual and a quality control manual. The current AC (AC 145-3, dated February 13, 1981) does not incorporate these new procedures and requirements, nor does it reflect industry practices used by certificated repair stations today. FAA, therefore, finds it necessary to discard current guidance material and proposed new guidance material. This proposed AC would replace AC 145-3.

The proposed AC incorporates several examples of quality systems that repair stations may choose from to determine which best suits their individual needs. The proposed AC also incorporates several "checklists" to determine if the repair station has fully considered all its options and requirements. Further, this AC aids in the development of procedures and programs to assist the harmonization efforts of FAAwith the European Joint Aviation Authority and other regulatory authorities.

You can get a copy of the proposed AC on AEA's website, www.aea.net.

Regulatory Update: CANADA

In November there were a number of Amendments to the Canadian Aviation Regulations (Part V). Following are some of the ones that may affect AMOs. The Association encourages affected repair stations to review the CARs amendments at http://www.tc.gc.ca/aviation/regserv/carac/CARAC/part5-m&m/maint/english/10000375.htm

REGULATIONS AMENDING THE CANADIAN AVIATION REGULATIONS (PARTS I, IVAND V) AMENDMENTS

The definition "maintenance" in subsection 101.01(1) of the Canadian Aviation Regulations (SOR/96-433) is replaced by the following:

"maintenance" means the overhaul, repair, required inspection or modification of an aeronautical product, or the removal of a component from or its installation on an aeronautical product, but does not include

(a) elementary work,

(b) servicing, or

(c) any work performed on an aircraft by the manufacturer prior to the issuance of the first certificate of airworthiness or the export airworthiness certificate (maintenance).

Subsection 400.03(1) of the Regulations is replaced by the following:

400.03 (1) Subject to subsection (3), tests, skill letters and examinations, including all sections of a sectionalized examination, that are required for the issuance of a permit or licence or for the endorsement of a permit or licence with a rating shall be completed during the 24-month period immediately preceding the date of the application for the permit, licence or rating.

Section 400.03 of the Regulations is amended by adding the following after subsection (2):

(3) The regulatory requirements examination referred to in subsection 566.03(5) of Standard 566 ˜ Aircraft Maintenance Engineer Licensing and Training that is required for the issuance of an aircraft maintenance engineer (AME) licence shall be completed during the 12-month period immediately following the date on which the application for the licence is accepted by the Minister.

Section 403.08 of the Regulations is amended by adding the following after subsection (2):

(3) The minister shall approve a policy manual or a training control manual and any amendments to that manual if the manual and amendments meet the requirements of Standard 566 ˜ Aircraft Maintenance Engineer Licensing and Training.

Subsection 507.08(1) of the Regulations is replaced by the following:

507.08 (1) When the owner of an aircraft requests an additional flight authority in accordance with section 507.06 and demonstrates compliance with the applicable standards contained in Standard 507 ˜ *Flight Authority and Certificate of Noise Compliance* and if the aircraft is safe for flight, the Minister shall issue;

(a) in the case of an aircraft that has been damaged or has inoperative systems such that it no longer conforms to the conditions of the existing flight authority, an additional flight authority to allow the aircraft to be flown to a location where the required maintenance can be performed; or

(b) in the case of an aircraft that has been modified to allow multiple configurations one of which results in the aircraft no longer meeting the conditions of issue of the existing flight authority, an additional flight authority in respect of the new configuration.

Paragraph 571.02(2)(b) of the Canadian Aviation Regulations is replaced by the following:

(b) if calibration requirements are published by the manufacturer of the measuring device or test equipment, is calibrated by means traceable to a national standard.

Paragraph 571.06(4)(b) of the Regulations is replaced by the following:

(b) installed by a person or organization other than the person or organization that made the part.

Schedule II to Subpart 71 of Part V of the Regulations is replaced by the following:

Schedule II

Section 571.04: Specialized Maintenance

The following tasks constitute the specialized maintenance referred to in section 571.04 of these Regulations. (Because of space constraints, I've only listed the avionics and instrument specialized maintenance. Information pertaining to Airframe, Engine, Propeller, Component, and Welding can be found on Transport Canada's website.)

Avionics

(1) The repair of avionics components and systems is avionics specialized maintenance, except for:

(a) repairs of wiring and connectors;

(b) replacement of connectors and electrical components with identical or equivalent items;

(c) replacement of antennas with identical or equivalent items;

(d) replacement of integral fuses and lighting components when the line replaceable unit (LRU) is designed for flight-line replacement of these components;

(e) replacement of an avionics LRU

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provided that any testing required can be done using standard test equipment, built-in test equipment (BITE) or equipment specified in the aircraft manufacturer's instructions for continuing airworthiness;

(f) on-site maintenance of passenger entertainment systems performed in accordance with the applicable instructions in the maintenance manual of the aircraft or systems manufacturer or the manufacturer's instructions for continuing airworthiness; and

(g) routine maintenance that is described in the aircraft manufacturer's maintenance manual or instructions for continuing airworthiness or performed in accordance with currently recognized industry practices for service in the field.

(2) Any avionics system installation or modification is avionics specialized maintenance except for:

(a) installation of ELT systems conforming to TSO C91/C91a;

(b) installation of single VHF communication or single integrated navigation/communication systems that are not interfaced with any other system, other than an intercom system;

(c) installation of VFR long-range navigation systems which are not interfaced with any other systems;

(d) modifications to existing avionics installations, where no additional test requirements are imposed on the affected system other than those which would be required following routine maintenance of that system;

(e) installation of instruments which are not interfaced with any other systems; and

(f) replacement of an avionics LRU where equivalency is maintained, and where no additional test requirements are imposed on the affected system other than those which would be required following routine maintenance of that system.

Instrument

Maintenance of instruments, other than display devices whose operation is integrated with an appliance to which another category of specialized maintenance applies, if the work is beyond the limits recommended in the manufacturer's maintenance manual or service instructions for service in the field, is instrument specialized maintenance.

The Regulations are amended by adding the following after section 573.14: Technical Records

573.15 An approved maintenance organization (AMO) certificate holder shall maintain records in accordance with section 573.15 of Standard 573 ˜ Approved Maintenance Organizations for work performed on all aeronautical products maintained and keep those records for at least two years beginning on the date that the maintenance release was signed.

Regulatory Update: EUROPE

In November and December the Joint Aviation Authority (JAA) issued two Notices of Proposed Amendments (NPA) that may affect repair stations in JAA member states the Association encourages affected repair stations to review the draft documents and submit your comments as soon as possible. These documents can be reviewed on the JAAwebsite at:
http://www.jaa.nl/catalogue/npas.html

NPA 11-2; REGULATORY IMPACT ASSESSMENT GUIDANCE

This NPA proposes guidance material (ACJ) for the development of a Regulatory Impact Assessment (RIA) as part of the Explanatory Note to a Notice of Proposed Amendment (NPA).

The NPA proposes changes to JAR-11 to provide guidance material for the conduct of a Regulatory Impact Assessment (RIA), which is a mandatory part of all new NPAs. The material has been developed by the ad-hoc RIA group. The JAR-11 Working Group (WG) had introduced in the draft JAR-11 in paragraphs 11.065(b) and 11.075(b) the requirement that a Cost/Safety Benefit Assessment be presented. The JAR-11 WG and especially the representatives from Industry believed that such a principle should be introduced to replace the present situation where there is a "non formal" requirement for Cost/Safety Benefit assessment.

Comments are due: March 1, 2003

NPA E-33 rev. 1 – Engine Control Systems

The NPA was first circulated on August 1, 2001 with a request for comments. Following a review of the comments submitted during this consultation the sponsor made a number of significant changes to the rule, in particular supporting what was initially only a "minority' position. Consequently, it has been decided to send out the NPA for a second round of consultation.

It should also be noted that, following the initial consultation of NPA E-33, GAI-20 has been published and therefore the original NPA has been separated into two separate NPAs, NPA E-33 and NPA 20-9. The JAA specifically requests comments on the proposed ACJ 20X-1, which has not been the subject of consultation before.

FAR33.28, containing the requirements for certification of electronic control systems, was published in Amendment 15 of FAR33. JAR-E had already been amended to include such systems (NPA-E-10) and in particular included dedicated advisory material (AMJ20X-1) on the subject. However, the FAR33 and JAR-E rules were significantly different. For example,

Frequently Asked Questions

TOPIC: Type Design

QUESTION:
What is a type design and how is it used?

ANSWER:

Type design is all of the drawings and the specifications that show compliance with the certification basis of the original aircraft and all of the data necessary to show that subsequent airplanes conform to the approved type design.

Most of us have been raised with the definition and limitations of alterations as specified in the definitions of Part 1 of the Federal Aviation Regulations (FAR) and the performance and recordkeeping criteria of alterations contained in Parts 43 and 65. However, when determining the approval of alterations, that information is contained in Part 21. Specifically, section 21.93 classifies changes in type design; section 21.95 defines the approval of minor changes in type design; section 21.97 defines approval of major changes in type design; and section 21.113 requires that any person who alters a product by introducing a major change in type design shall apply to the Administrator for a supplemental type certificate, or in the case of a holder of a type certificate, for the product they may apply for amendment of the original type certificate.

The modern FARs do not contain a definition of what a type design is, but in the Civil Aeronautics Manual 3 dated May 1962, the Federal Aviation Agency did. In this manual, the FAA describes type design as "the drawing and the specifications as are necessary to disclose the configuration of the airplane and all design features covering the requirements of the part, such information on dimensions, materials, and processes as is necessary to define the structural strength of the airplane, and such other data as are necessary to permit by comparison the determination of the airworthiness of subsequent airplanes of the same type."

In the process of producing aircraft, the FAA issues three certificates: First, after approving the type design the FAA issues a Type Certificate. Second, after inspecting the production facility, the FAA issues a Production Certificate and finally, when the production aircraft is inspected for conformity to the original type design, the aircraft is issued an Airworthiness Certificate.

In the process of upgrading aircraft systems, we routinely find the need to alter the original type design. Part 21 gives us that authority to make a change to the type design depending on the effect the proposed alteration has on the type certificated product. Major changes to type design require us to apply for an STC. However, minor changes to type design are approved in a manner acceptable to the Administrator. With few exceptions, the Administrator has stated that minor changes in type design that meet the definition of a minor alteration can use acceptable data and can be approved for return to service by an appropriately rated mechanic or repair station. The Administrator also has stated that minor type design changes that meet the definition of a major alteration need to use approved data and can be returned to service by a mechanic who has received Inspection Authorization or a properly rated repair station.

We have used type design every day of our aviation careers. We use it in certifying the airworthiness of a customer's aircraft, in developing repair strategies and in determining the certification basis of alterations. For more information on type design refer to the Federal Aviation Regulation (FAR) Part 21 Subpart D. q

Note: AEA offers these Frequently Asked Questions (FAQs) in order to foster greater understanding of the rules that govern our industry. AEA strives to make them as accurate as possible at the time they are written, but rules change so you should verify any information you receive from an AEA FAQ before you rely on it. AEA DISCLAIMS ANY WARRANTY FOR THE ACCURACY OF THE INFORMATION PROVIDED. This information is NOT meant to serve as legal advice – if you have particular legal questions, you should contact an attorney.

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FAR33.28 was only applicable to electronic controls systems while JAR-E 50 was applicable to all types of engine control systems. In both cases the advisory material contained information that was considered mandatory and therefore should have been contained in the rules.

A harmonization activity was initiated which resulted in the version of NPA-E-33 dated April 20, 2001 and this version was circulated for worldwide comment. It contained rules and advisory almost identical to those proposed for FAR33, any differences which existed were for the internal consistency of JAR-E after integration of the new text. However, the Justification of the NPA contained two 'minority' positions proposed by a manufacturer, related to aircraft supplied power and aircraft supplied data. In summary, the objections were to the fact that the rule, as proposed, demanded that the engine be able to cope with loss, corruption or failure in any manner of these aircraft resources, regardless of the demonstrated reliability of the aircraft system. The Engine Steering Group (ESG) subsequently concluded that these objections were valid and that the reliability of the supply should be a factor in determining the required degree of protection against failure. Their position has been included in this revised NPA.

Comments are due: February 1, 2003. q