The following is an important overview from our representative ***Christine Negroni****, of NADA/'F's role, and the important work done on the FAA ARAC "Aging Aircraft" Working Group, including aging wiring. The work continues.*

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What We're Doing: A report from Christine Negroni

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When considering new regulations for air safety, the FAA makes an essential calculation: How much will each improvement cost? How great will be the benefit? This cost benefit analysis is part of the decision-making.

It's easy to understand the expenses that go along with installing new equipment. But the price of more frequent aircraft inspections, for example, would include not just the salary of the maintenance worker doing the inspection but also the loss of revenue while the plane is out of service. When supplemental training of mechanics and inspectors takes them off the hangar floor there's the cost of workers lost to training, and the price of finding replacement help, which could include reworking maintenance schedules and paying overtime.

Some costly improvements are deemed worthwhile. Others are not. And sometimes, it takes an airplane crash to create sufficient pressure for the FAA to order the aviation industry to spend money for safety.

After the two highly-publicized airline crashes; TWA Flight 800 in 1996 and Swissair 111 two years later, the *National Air Disaster Alliance* convinced the FAA that in considering new rules for air safety, passengers should be represented on the various FAA committees that make those recommendations. After all, airline operators, airplane and airplane parts manufacturers, pilots, mechanics, even NASA and the Department of Defense have a say, why not those most affected, the people who lost loved ones in air disasters?

The Aging Transport Systems Rulemaking Advisory Committee, (ATSRAC) was formed in 1998. *NADA/F's* representative for the first 3 years was Gary Slater, a professor of Aerospace Engineering at the University of Cincinnati. When he was no longer able to dedicate the time to the ATSRAC in 2001, I took over for him.

Among other things, the ATSRAC committee analyzes the effect of age on aircraft wiring systems. Its most significant activity in my opinion was the inspection of a number of in service and out of service airliners, which took place over the course of more than a year. This study was designed to get a get a handle on how aircraft wiring aged and whether aging was creating safety hazards. The conclusion was startling. As I wrote in my book, Deadly Departure, aging, degrading aircraft wiring was a sleeping giant.

On the six airplanes examined most thoroughly, members of a working group reporting to the ATSRAC found breaks in the wire insulation at an average rate of 860 per plane. Another aspect of the aging aircraft review was the examination of electrical problems reported during flight through service difficulty reports. What was found was uncontestable: There was a significant increase in wiring problems on older aircraft.

Even so, age wasn't the only factor threatening the integrity of aircraft wiring. Airline maintenance practices like using a drill over exposed wire bundles and then failing to clean the metal shavings were damaging wires. Installation designs could also damage the condition of wires if they were routed too closely together or bent at too severe a turn. These designs and practices needed review, as did the frequency of intense wire inspections and the practice of resetting tripped circuit breakers.

As we discuss these issues, I have reminded my fellow ATSRAC members that the cost of air safety is more than the money paid by the industry. NADA/F had a seat at the table to remind them that its members had paid a price too, the loss of husbands, wives, mothers, fathers, lovers, children and friends.

One or two reminders go a long way. The FAA proposed regulations that address age-related air safety problems on 7/30/04.** Some of the proposals come as the result of work done by the ATSRAC. Some rules come from other FAA advisory committees on which *NADA/F* representatives hold a seat.

The ignition of the center fuel tank that caused the crash of TWA flight 800, and more than two dozen other fuel air explosions over the past 40 years prompted the FAA to require a new assessment of fuel tank systems for future aircraft designs. Operational procedures and fuel tank maintenance will also be reviewed for ways to reduce this safety hazard.

The crash of Swissair 111 revealed wiring problems in keeping with what the ATSRACs survey would later show. As a consequence, a package of new regulations will require airplane operators to improve wire maintenance and inspection programs.

New corrosion prevention and maintenance in aircraft structures is also part of the FAA's proposed new rules.

The work of the ATSRAC continues. International aviation regulatory bodies have voting representation on the committee, which is intended to increase the likelihood that aviation authorities in other parts of the world will adopt similar measures.

In upcoming ATSRAC meetings, members will discuss how its recommendations for enhancing the design, installation, care and maintenance of aircraft wire systems can be applied to small airplanes. Christine Negroni

** Federal Register Vol. 69 No. 146 Docket No. FAA-2004-17681; Amendment No. 91-283, 121-305, 125-46, 129-39
Fuel Tank Safety Compliance Extension (Final Rule) and Aging Airplane Program Update (Request for Comments).

January 26, 2005

To: the FAA via Chuck Huber

From: ATSRAC members Wayne Maxey, Kirk Thornburg, Ric Anderson, Vic Card, Patrick Glapa, Franz Frank, Doug Hill and **Christine Negroni**

For the past eight months, Harmonization Working Group #13 of the ATSRAC has been reviewing the aircraft wiring maintenance, maintenance training and repair practices on small transport category aircraft (STA). The working group explains that the significant distinction between large transport category aircraft (LTA) and STAs in terms of maintenance is that STA operators do not develop their individual maintenance programs, depending instead on their voluntary compliance with manufacturers' instructions for continued airworthiness (ICA).

While the ATSRAC recommended that the FAA require manufacturers of large transport airplanes to perform an enhanced zonal analysis procedure (EZAP) on the electrical wiring interconnect system (EWIS) and to require operators of LTAs to incorporate the EZAP maintenance actions into their maintenance schedules, HWG#13 concludes that for STAs

such regulation is unnecessary as the ICAs already cover a majority of the EWIS issues. Without arguing with the group's assessment, we do disagree with its conclusion.

HWG#13 reviewed the maintenance guidance for 10 small transport aircraft, looking at the ICAs, Aircraft Maintenance Manuals (AMM), Standard Practice Manuals (SPM) and an advisory circular 43.13-1B. Taken together, HWG#13 finds these are sufficient for meeting enhanced EWIS standards and that failure to heed existing maintenance or inspection guidance is the problem.

At the same time, HWG#13 concedes that a "certain level of complacency exists in the aircraft maintenance industry with respect to EWIS." If guidance for detecting EWIS discrepancies exists but is not followed, mandatory compliance would seem to address that.

Additionally, there is some reason to believe that manufacturer attempts to be proactive are handicapped in the absence of defined rules. Boeing's Don Andersen told the ATSRAC of a recent experience in which Boeing attempted to make changes to a recommended maintenance plan but was thwarted because those changes were determined by the maintenance review board to be unnecessary and onerous to operators. The changes were delayed pending the release of an appropriate rule.

Andersen makes the point that LTA manufacturers may be willing to conduct voluntary EZAPs but for the commercial operators an FAA rule seems to be required to adopt enhanced maintenance tasks.

Commercial operators of small transports may indeed be willing to adopt changes to a standard maintenance plan. If so, it can only assist in this effort if the STA manufacturers are required to update maintenance plans within a certain schedule and using an acceptable assessment process.

Increased Awareness

The Aircraft Electronics Association (AEA) and the National Business Aviation Association (NBAA) have been making presentations on new best practices to the STA maintenance industry. These presentations have been successful in that "they were followed by a noticeable drop in the number of EWIS related discrepancies" according to HWG#13 group chairman Jon Haag. Haag told the committee that the participations at the presentations “see the value gained". But attendance at these presentations is entirely voluntary.

All five of the STA OEMs were represented on HGW#13, leading Haag to tell ATSRAC, "The OEMs, the five in this thing realize they have a new concept. They realize they don't meet the full intent of EZAP but they know they have to get updated. In the five years between regulation and effectiveness, they're going to get this done."

Regulatory Costs

In light of the financial and moral risks associated with failing to apply EZAP, is logical to expect that STAs and the manufacturers' ICAs will incorporate enhanced all EWIS standards voluntarily. If, as HWG13 claims, some STA manufacturers have accomplished a majority of the enhancements already, then showing compliance to any future rule should be relatively effortless. The argument that proving compliance to the FAA will be a financial burden does not seem logical and HWG#13 members did not explain why they believed the regulations would be a financial burden. In any event the cost benefit analysis would be the FAA's responsibility.

Ethical Responsibilities

The group also claims that STAs do not need the FAA to regulate compliance because a competitive business environment and the responsibility of carrying, in many cases, the top executives of their own companies, are incentive enough. This distinction is not convincing. Commercial operators feel no less the moral and financial responsibility of the safe transport of their passengers.

Some argument was made that there is a relevant difference between private and public air transport in terms of the FAA's regulatory role. But we can see no reason to assume that the FAA or the NTSB believe that the level of safety is acceptably less for STAs than LTAs. It was, in fact, the 1999 crash of a private jet carrying golfer Payne Stewart that resulted in ATSRAC's expanded task to review STAs.

Summary

Finally, while the majority of air carriers, large and small will do their best to meet the highest standards for air safety, regulation is rarely intended to address the responsible behavior of the majority. In aviation the stakes are too high and the industry under too much pressure to assume that these issues, as important as they are, will be fully incorporated by all STAs manufacturers and operators without prodding by the FAA.

Christine Negroni