

ATSRAC WG 8 Final Report to FAA
August 2, 2002

1 - BACKGROUND:

a. SAFETY ISSUE ADDRESSED/STATEMENT OF THE PROBLEM

- (1) What prompted this rulemaking activity (e.g., accident, accident investigation, NTSB recommendation, new technology, service history, etc.)? What focused our attention on the issue?

There have been several aviation accidents that were traced to wiring related causes (TWA 800 and Swiss Air 111). ATSRAC was formed and performed non-intrusive and intrusive inspections. The results of these inspections led ATSRAC to believe that it a Wiring Systems Training Program would help reduce this problem's impact.

- (2) What is the underlying safety issue to be addressed in this proposal?

Damage occurring to aircraft wiring systems through neglect, wrong wiring installations, improper wiring repairs, or ignorance of proper maintenance practices.

- (3) What is the underlying safety rationale for the requirement?

Proper training on wiring systems maintenance practices and requirements will result in a reduction of the damage being done as a result of neglect, wrong wiring installations, improper wiring repairs, or ignorance of proper maintenance practices.

- (4) Why should the requirement exist?

To improve maintenance practices and the life of aircraft wiring systems.

b. CURRENT STANDARDS OR MEANS TO ADDRESS

1) *If regulations currently exist:*

- (a) What are the current regulations relative to this subject? (Include both the FAR's and JAR's.)

None

- (b) How have the regulations been applied? (What are the current means of compliance?) If there are differences between the FAR and JAR, what are they and how has each been applied? (Include a discussion of any advisory material that currently exists.)

N/A

- (c) What has occurred since those regulations were adopted that has caused us to conclude that additional or revised regulations are necessary? Why are those regulations now inadequate?

We will require a regulation to implement enhanced electrical wiring interconnection systems maintenance and maintenance training programs.

2. *If no regulations currently exist:*

- (a) What means, if any, have been used in the past to ensure that this safety issue is addressed? Has the FAA relied on issue papers? Special Conditions? Policy statements? Certification action items? If so, reproduce the applicable text from these items that is relative to this issue.

Some examples of AC's that reference wiring issues are:

Advisory Circulars AC 20-53, Protection of Airplane Fuel Systems Against Fuel Vapor Ignition Due to Lightning, AC 20-13, Protection of Aircraft Electrical/Electronic Systems Against the Indirect Effects of Lightning, AC 25-16, Electrical Fault and Fire Protection and Prevention, AC 25-98-11B, Fuel Tank Ignition Source Prevention Guidelines, AC 43-13-1B, Acceptable methods, Techniques and Practices for Repairs and Alterations to Aircraft all relate to Aircraft Wiring.

- (b) Why are those means inadequate? Why is rulemaking considered necessary (i.e., do we need a general standard instead of addressing the issue on a case-by-case basis?)

Advisory Circular will advise, rule will mandate training program.

2. DISCUSSION

a. SECTION-BY-SECTION DESCRIPTION OF PROPOSED ACTION

- (1) What is the proposed action? Is the proposed action to introduce a new regulation, revise the existing regulation, or to take some other action?

Provide an AC to explain how to develop and deliver an electrical wiring interconnection system maintenance training program. This AC will support the actual rule which will be developed by WG 9.

- (2) If regulatory action is proposed, what is the text of the proposed regulation?

- (3) If this text changes current regulations, what change does it make? For each change:

- What is the reason for the change?
- What is the effect of the change?

- (5) If not answered already, how will the proposed action address (i.e., correct, eliminate) the underlying safety issue (identified previously)?

Proper training on electrical wiring interconnection systems maintenance practices and requirements will result in a reduction of the damage being done as a result of ignorance or neglect. This will increase the life and safety of the aircraft electrical wiring interconnection systems.

- (6) Why is the proposed action superior to the current regulations?

There is no current regulation.

b. ALTERNATIVES CONSIDERED

- (1) What actions did the working group consider other than the action proposed? Explain alternative ideas and dissenting opinions.

WG 8 were tasked by ATSRAC to develop a training program for wiring systems maintenance. As part of that task the following alternative actions and processes were considered.

1. Adding information about the EZAP process and how to do the analysis to the wiring systems maintenance training program.

2. Manufacturers should develop and make readily available an “on line” library of pictures showing wiring faults and failures. This could then be used by the training developers/providers to illustrate typical faults.

3. Troubleshooting processes and procedures should be included in the wiring systems maintenance training program.

- (2) Why was each action rejected (e.g., cost/benefit? unacceptable decrease in the level of safety? lack of consensus? etc.)? Include the pros and cons associated with each alternative.

These alternative actions and processes were discussed and rejected for the following reasons.

1. The adding of information about the EZAP process and how to do the analysis was discussed at length. WG 8 felt that the work of performing the actual analysis is beyond the scope of the aircraft maintenance personnel so this training would be of no benefit to them. There would also be additional cost to the operator that would be significant due to the large numbers of maintenance personnel projected to be included in this training program.

2. The manufacturers rejected this proposal as being too expensive to develop for the amount of use that would be made of the information. The counter proposal from the manufacturers is to make this information available on an “as requested” basis for the operators when they develop their individual training programs. While this is not a totally satisfactory solution, and it continues to be a discussion item with the manufacturers, it is one that would accomplish the WG 8 intent.

3. The members of WG 8 discussed this issue and it was felt that the topic of troubleshooting was too complex to be included in the wiring systems maintenance training program. The goal of this program is to deal with the proper care and maintenance of wiring systems and the training needs to focus in on this. The inclusion of troubleshooting would either dilute the initial course purpose (by taking up time needed for wiring systems topics) or make the course length excessive. Troubleshooting, as a stand alone topic, can be taught in a format that includes, but is not limited to wiring issues, so it was not included in this course.

3. COSTS AND OTHER ISSUES THAT MUST BE CONSIDERED

a. COSTS ASSOCIATED WITH THE PROPOSAL

- (1) Who would be affected by the proposed change? How? (Identify the parties that would be materially affected by the rule change – airplane manufacturers, airplane operators, etc.)

Aircraft Operators

Aircraft Manufacturers

Third Party Maintenance Providers

STC Holders

- (2) What is the cost impact of complying with the proposed regulation? Provide any information that will assist in estimating the costs (either positive or negative) of the proposed rule. :

- *What are the differences (in general terms) between current practice and the actions required by the new rule?*

The new AC will advise all affected organizations on how to provide training to all employees who have contact with electrical wiring interconnection systems. This cost is not known at this time but is estimated to be significant.

Information to develop the associated costs has been previously sent to the FAA financial analysis group by WG 8.

- *If new tests or designs are required, how much time and costs would be associated with them?*
- *If new equipment is required, what can be reported relative to purchase, installation, and maintenance costs?*
- *In contrast, if the proposed rule relieves industry of testing or other costs, please provide any known estimate of costs.*
- *What more-- or what less -- will affected parties have to do if this rule is issued?*

NOTE: “Cost” does not have to be stated in terms of dollars; it can be stated in terms of work-hours, downtime, etc. Include as much detail as possible

b. OTHER ISSUES

- (1) Will small businesses be affected? *(In general terms, “small businesses” are those employing 1,500 people or less. This question relates to the Regulatory Flexibility Act of 1980 and the Small Business Regulatory Enforcement Fairness Act of 1996.)*

Yes. Many third party maintenance providers fall into the small business classification.

- (2) Will the proposed rule require affected parties to do any new or additional recordkeeping? If so, explain. *[This question relates to the Paperwork Reduction Act of 1995.]*

Additional training will have to be tracked. This will be done with existing systems but will require some additional paperwork.

- (3) Will the proposed rule create any unnecessary obstacles to the foreign commerce of the United States -- i.e., create barriers to international trade? *[This question relates to the Trade Agreement Act of 1979.]*

Possibly, but we do not have the data to make the call on this.

- (4) Will the proposed rule result in spending by State, local, or tribal governments, or by the private sector, that will be \$100 million or more in one year? *[This question relates to the Unfunded Mandates Reform Act of 1995.]*

Private sector spending may exceed \$100 million per year in the first few years of this program. The FAA financial analysis will be able to answer this question more accurately.

4. ADVISORY MATERIAL

- a. Is existing FAA advisory material adequate?

No. There is currently no Advisory Material specifically targeted at training to maintain Aircraft Wiring Systems.

- b. If not, what advisory material should be adopted? Should the existing material be revised, or should new material be provided?

A new AC to cover Aircraft Wiring Systems Maintenance Training has been developed.

- c. Insert the text of the proposed advisory material here (or attach), or summarize the information it will contain, and indicate what form it will be in (e.g., Advisory Circular, policy statement, FAA Order, etc.)

See proposed AC table of contents on next page and the full AC that is included as part of the WG 8 work product:



U.S. Department
of Transportation
**Federal Aviation
Administration**

Advisory Circular

**Subject: AIRCRAFT ELECTRICAL WIRING
INTERCONNECTION SYSTEMS TRAINING
PROGRAM**

**Date: 08/02/02
Initiated By: WG8**

**AC No: 120-YY
Change:**

DRAFT

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1. PURPOSE.

This Advisory Circular (AC) provides guidance for developing an enhanced Electrical Wiring Interconnection System (EWIS) training program. The guidance in this AC is based on recommendations submitted to the FAA from the Aging Transport Systems rulemaking Advisory Committee (ATSRAC). The guidance and recommendations in this AC are derived from the best practices training developed through extensive research by ATSRAC Industry Working Groups 5 and 8. This AC is an effort by the FAA to officially endorse these best practices and to dispense this information industry wide so

5. ADDITIONAL RECOMMENDATIONS:

The following two additional recommendations should be considered by the FAA in order to insure the full implementation of the recommended actions.

- 1. FAR 147 should to be revised to include electrical wiring interconnection system maintenance training as part of the core curriculum for AMT's. The current proposed revision of 147 would be a great opportunity to incorporate this.**
- 2. Electrical wiring interconnection system maintenance training should be included in the forthcoming FAR 145 Training Program Advisory Circular. This will insure that the 145 operators are receiving the same level of training as the 121 operators.**