



# **Electrical Wiring Interconnection Systems Maintenance and Inspection Training Program ATSRAC WG-8**

Presented by

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November 5 , 2002

FAA Inspectors Workshop





## **TASKING OF WG-8**

**8.1 Establish Harmonization Working Group (HWG)**

**8.2 Coordinate with other ATSRAC HWG's**

**8.3 Develop Guidance for Electrical Wiring Interconnection System (EWIS) Training Program**





# MILESTONES:

## 8.1 – Establish Harmonization Working Group (HWG) June 01

### JUNE 2001

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30





# MILESTONES:

8.1 – June 2001

8.2 – Coordinate with other ATSRAC HWG's -  
October 02



## OCTOBER 2002

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		



## MILESTONES:

8.1 – June 01

8.2 – October 02

8.3 – Develop Guidance for Electrical Wiring  
Interconnection System (EWIS) Training Program -  
October 02



## OCTOBER 2002

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		



## HWG-8 MEMBERS

**Co-Chairs:** Spencer Bennett – FedEx  
Gunter Friedrich – Lufthansa Tech. Trng.

**Members:** Sam Baker – American Trans Air  
Jean-Pierre Capo – Airbus  
Terje Hove – Norwegian CAA  
Fred Sobeck – FAA  
Paul Lapwood – Flight Safety Boeing  
Lance Campbell – BF Goodrich  
Ed Block – GASI  
Richard Jones - FAA





## MEETINGS:

Jun. 6, 01	Memphis (Co-chairs)
Jun. 26-27, 01	Memphis
Aug. 7-8, 01	Toulouse
Sep. 18, 01	Seattle

Nov. 6-8, 01	Longbeach
Jan. 8-10, 02	Miami
Mar. 19-21, 02	Indianapolis
Jun. 4-6, 02	Seattle

Meetings were well attended. Not all members made all of the meetings but all were kept in the loop by means of E-Mail and conference calls.

Co-chairs attended all ATSRAC meetings and reported on HWG-8 progress. All portions of the final product were voted on and approved by ATSRAC.





## HWG-8 TASK 8.3

**Develop guidance for electrical wiring interconnection systems (EWIS) training program.**





## **CONCEPT:**

- 1. Based on HWG-5 results, identify target groups for receiving the training.**
- 2. Identify the content of the minimum required training for each target group.**
- 3. Present the HWG-8 proposal to ATSRAC for approval (AC and Appendices)**





## **WORK PLAN:**

- 1. Identify the target groups based on their job on the aircraft.**
- 2. Select the minimum training items for each target group.**
- 3. Present proposal to ATSRAC for approval.**
- 4. Update finished product as needed to insure harmonization with other ATSRAC HWG's.**





## **DELIVERED:**

**A detailed training program for each target group.**

**8 target groups were identified.**

**(Note: 7<sup>th</sup> and 8<sup>th</sup> target groups are aircrew)**

**Minimum training program content determined for each group.**

**AC outlining the program and how to comply with it delivered to ATSRAC.**





## **POINTS:**

- **The training programs are outlined in an AC to allow for easier revision if needed in the future.**
- **The actual training requirements will be specified in Operating Rules (121, 145, etc.) so they can be more specific to each operation's needs.**



# APPENDIX A

## Electrical Wiring Interconnect Systems Initial Training Program

### APPENDIX A

#### ELECTRICAL WIRING INTERCONNECTION SYSTEMS MINIMUM INITIAL TRAINING PROGRAM

Target group 1:	Qualified staff performing electrical wiring interconnection systems maintenance.
Target group 2:	Qualified staff performing maintenance inspections on electrical wiring interconnection systems
Target group 3:	Qualified staff performing electrical/avionic engineering on in service aircraft
Target group 4:	Qualified staff performing general maintenance/inspections not involving electrical wiring interconnection systems maintenance.(LRU change
Target group 5:	Qualified staff performing other engineering or planning work on in service aircraft
Target group 6:	Other service staff with duties in proximity to electrical wiring interconnection systems.
Target group 7:	Flight Deck Crew
Target group 8:	Cabin Crew

TARGET GROUP	1	2	3	4	5	6	7	8
<b>A – INTRODUCTION</b>								
Demonstrate the safe handling of airplane electrical systems, Line Replaceable Units (LRU's), tooling, troubleshooting procedures, and electrical measurement.								
1. Safety practices	X	X		X		X	X	X
2. Electrostatic Discharge Sensitive (ESDS) Device handling and protection	X	X		X				
3. Tools, special tools and equipment	X	X						
4. Verify calibration/certification of instruments, tools, and equipment	X	X						
5. Required wiring checks using the Troubleshooting Procedures and Charts	X							
6. Measurement and troubleshooting using meters.	X	X						
7. LRU replacement general practices	X	X		X				
<b>B – WIRING PRACTICES DOCUMENTATION</b>	1	2	3	4	5	6	7	8
Know the construction and navigation of the applicable airplane wiring system overhaul or wiring practices manual								
8. Chapter 20 structure/overview	X	X	X					
9. Chapter cross-reference Index	X	X	X					
10. Important Data and Tables	X	X	X					
11. Wiring Diagram manual	X	X	X					
12. Other Documentation as applicable	X	X	X					
<b>C – INSPECTION</b>	1	2	3	4	5	6	7	8
Know the different types of inspections, human factors in inspections, zonal areas and typical damages								
13. General Visual Inspection (GVI), Detailed Inspection (DET), Special Detailed Inspection (SDI), Zonal Inspection and Enhanced Zonal Inspection Analysis Procedure (EZAP)	X	X		X	X			
14. Human factors in inspection		X			X			
15. Zonal areas of inspection		X			X			
16. Wiring system damage	X	X		X	X	low level	low level	low level

# Example of Training Program – TG 1 Page 1

<b>A – INTRODUCTION</b>							
<b>Demonstrate the safe handling of airplane electrical systems, Line Replaceable Units (LRU's), tooling, troubleshooting procedures, and electrical measurement.</b>							
1. Safety practices							X
2. Electrostatic Discharge Sensitive (ESDS) Device handling and protection							X
3. Tools, special tools and equipment							X
4. Verify calibration/certification of instruments, tools, and equipment							X
5. Required wiring checks using the Troubleshooting Procedures and Charts							X
6. Measurement and troubleshooting using meters.							X
7. LRU replacement general practices							X
<b>B – WIRING PRACTICES DOCUMENTATION</b>							1
<b>Know the construction and navigation of the applicable airplane wiring system overhaul or wiring practices manual</b>							
8. Chapter 20 structure/overview							X
9. Chapter cross-reference Index							X
10. Important Data and Tables							X
11. Wiring Diagram Manual							X
12. Other Documentation as applicable							X
<b>C – INSPECTION</b>							1
<b>Know the different types of inspections, human factors in inspections, zonal areas and typical damages</b>							
13. General Visual Inspection (GVI), Detailed Inspection (DET), Special Detailed Inspection (SDI), Zonal Inspection and Enhanced Zonal Inspection Analysis Procedure (EZAP)							X
14. Human factors in inspection							
15. Zonal areas of inspection							
16. Wiring system damage							X

# Example of Training Program – TG 1 Page 2

<b><u>D – HOUSEKEEPING:</u></b>								1
<b>Know the contamination sources, materials, cleaning and protection procedures</b>								
17. Airplane external contamination sources								X
18. Airplane internal contamination sources								X
19. Other contamination sources								X
20. Contamination protection planning								X
21. Protection during airplane maintenance and repair								X
22. Cleaning processes								X
<b><u>E – WIRE:</u></b>								1
<b>Demonstrate the correct identification of different wire types, their inspection criteria, and damage tolerance, repair and preventative maintenance procedures</b>								
23. Identification, type and construction								X
24. Insulation damage limits								X
25. Inspection criteria and standards of wire and wire bundles								
26. Wire bundle installation practices								X
27. Typical damage and areas found (airplane specific)								X
28. Maintenance and repair procedures								X
29. Sleeving								X
30. Unused wires-termination and storage								X
31. Electrical bonding and grounds								X

# Example of Training Program – TG 1 Page 3

<b><u>F – CONNECTIVE DEVICES:</u></b>								1
<b>Know the procedures to identify, inspect and find the correct repair for typical types of connectors found on the technician's airplane.</b>								
32. General types and identification								X
33. Cautions and protections								X
34. Visual inspection procedures								X
35. Typical damage found								X
36. Repair procedures								X
<b><u>G – CONNECTIVE DEVICE REPAIR:</u></b>								1
<b>Demonstrate the procedures to replacement of all parts for typical types of connectors found on the technician's airplane.</b>								
37. Circular Connectors								X
38. Rectangular Connectors								X
39. Terminal Blocks-Modular								X
40. Terminal Blocks- Non-modular								X
41. Grounding Modules								X
42. Pressure Seals								X

# Pg. 1 of A-C No. 120-YY

**DRAFT** (18.07.2002)



US Department  
of Transportation  
**Federal Aviation  
Administration**

## Advisory Circular

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<b>Subject: AIR CRAFT ELECTRICAL WIRING INTERCONNECTION SYSTEMS TRAINING PROGRAM</b>	<b>Date: 07/18/02</b>	<b>AC No: 120-YY</b>
	<b>Initiated By: WG8</b>	<b>Change:</b>
		<b>DRAFT</b>

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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 the benefits of this information can be effectively realized. Adoption of the recommendations in this AC will result in a training program that will improve the



**QUESTIONS**