

AGING TRANSPORT SYSTEMS RULEMAKING ADVISORY COMMITTEE (ATSRAC) HWG#12

DATE: 12 October 2005

WORKING GROUP / TASK #: 12	CO-CHAIRS: Kent Hollinger Dave Tudor		
MEMBERS:			
<u>NAME</u>	<u>ORGANIZATION</u>	<u>NAME</u>	<u>ORGANIZATION</u>
Mike Walz	FAA	Luci Crittenden (secretary)	NASA
Galen Deeds	ABX Air / GE Aircraft Engines	Bert Johan Vollmuller	NLR
Jean-Luc Ballenghien	Airbus	Larry Stevick	Northwest Airlines
Patrick Gombert	Airbus	Richard T. Jones	QinetiQ
Ken Elias	ALPA	Joe Kurek	Raytheon Tech Services
Giday Girmay	Boeing	Phil LaCourt	SAE
Darrel Santala	Boeing	Jack Sutherland	Tensolite
Petar Glamoclija	Bombardier	Jean Cartier	Transport Canada
Frederic Miramalous	Labinal		
<u>DATE</u>		<u>LOCATION</u>	
PAST MEETINGS:		FAA AANC NDI Lab @ Albuquerque, NM	
September 16-18, 2003		Raytheon Technical Services @ Indianapolis, IN	
December 2-4, 2003		Airbus @ Toulouse, France	
March 16-18, 2004		Bombardier @ Montreal, QC	
June 20-22, 2004		Boeing @ Seattle, WA	
December 7-9, 2004		Civil Aviation Authority @ Gatwick House, UK	
June 21-23, 2005			
FUTURE MEETINGS:		Tensolite @ St. Augustine, FL	
November 29-30, 2005			
OVERVIEW: Identify, review, screen, transfer and implement technologies and knowledge that enhance the safety and continued airworthiness of aircraft EWIS. The scope of this HWG includes procedures, equipment and systems to design, monitor, inspect, test and maintain EWIS.			

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<u>SUB-TASK#</u>	<u>DESCRIPTION</u>	<u>ESTIMATED COMPLETION DATE</u>	<u>STATUS (RED/GREEN/YELLOW)</u>
12.1 Develop effective strategies to transfer and implement products (including knowledge) resulting from mature R&D efforts.	A. <u>Aging Circuit Breaker Report</u>		
	1. Review report DOT/FAA/AR-01/118 and its recommendations.	October 2003	COMPLETE
	2. Develop strategy for each appropriate recommendation.	January 2004	COMPLETE (5 Recommendations, plus letter to SAE)
	B. <u>Single Phase Arc Fault Circuit Breaker</u>		
	1. Develop strategy for forward fit.	January 2004	COMPLETE
	2. Develop strategy for retrofit.	July 2004 January 2005	COMPLETE (Made Recommendation)
	3. Identify operational and maintenance considerations.	July 2004 October 2004	COMPLETE (Made Recommendation)
	4. Specify advisory materials requiring revision.	July 2004 October 2005	COMPLETE (None)
	5. Specify necessary operational and maintenance training areas.	July 2004 October 2004	COMPLETE (Made Recommendation)
	6. Recommend education of regulators. (NEW)	Pending AC June 2005	COMPLETE (FAA will conduct seminar at March 2006 Aging Aircraft Conference)

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<u>SUB-TASK#</u>	<u>DESCRIPTION</u>	<u>ESTIMATED COMPLETION DATE</u>	<u>STATUS (RED/GREEN/YELLOW)</u>
12.2 Review and screen on-going R&D efforts and devise strategies to further develop these products into commercially viable solutions, as appropriate.	A. <u>Material Characterization Report</u>		
	1. Review report.	October 2003 January 2004	COMPLETE
	2. Make recommendation for dissemination of information, if appropriate.	January 2004 April 2004	COMPLETE (No Dissemination)
	3. Make recommendation for dissemination of revised report (due to HWG#12 inputs), if appropriate. Suggested editorial clarifications.	July 2004	COMPLETE (Make Report Public)
	B. <u>Excited Dielectric Test</u>		
	1. Review status and the schedule that will be determined after Navy Critical Design Review (contract ends June 2004).	January 2004	COMPLETE
	2. Monitor progress.	July 2004	COMPLETE
3. Possible field test with ABX.	January 2005	Solely in the Navy's hands. Will not be pursued by FAA.	

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12.2 (continued)	C. <u>Fiber Optical Chafe Detection</u>		
	1. Review preliminary data.	April 2004	COMPLETE
	2. Make recommendation for dissemination of information, if appropriate.	July 2004	COMPLETE (FAA Tech Note has been issued. Report is not appropriate for dissemination.)
	<u>NOTE</u> : The Navy is now in charge of program.		
	D. <u>Wire Indenter</u>		
	1. Review report.	October 2003	COMPLETE
	2. Develop recommendations for enhancements to improve utility for wire inspection. Include in Phase II research.	April 2004	COMPLETE
) Medium	3. Review Phase II results.	April 2005 June 2005	COMPLETE (Not useful for aircraft wiring. No further research recommended.)
	E. <u>Wire Performance Specification</u>		
	1. Review report.	January 2004	COMPLETE
	2. Develop recommendations for consideration in the FAA wire performance project. Draft AC is in progress. Review AC when supplied.	July 2004 TBD	COMPLETE (Made Recommendation)

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12.2 (continued)	<u>F. Maintenance Effects on EWIS</u>		
	1. Review report.	April 2004	COMPLETE
	2. Develop recommendations for enhancements to improve EWIS maintenance practices and non-EWIS practices that impinge upon the EWIS.	January 2005	COMPLETE (Made Recommendation)
	<u>G. Effects of Mixed Wire Types in Aircraft EWIS</u>		
	0. Review preliminary data.	October 2003	COMPLETE
	1. Review report.	April 2004	COMPLETE
	2. Develop recommendations regarding mixing of wire types in aircraft EWIS.	January 2005	COMPLETE (Made Recommendation)
	<u>H. Separation and Segregation in Aircraft EWIS</u>		
	1. Review preliminary data and status.	January 2004	COMPLETE
	2. Review report.	October 2004	Original program terminated by FAA. Final report not available for review.
	3. Develop recommendations regarding separation and segregation of wire and cables in aircraft EWIS.	July 2005	

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12.2 (continued)			
	<u>I. Broadband Impedance Measurement</u>		
	1. Review report.	October 2004	Final report not adequate for dissemination.
	2. Make recommendation for dissemination of information, if appropriate.	January 2005	
	<u>J. Pseudo Random Binary Reflectometry</u>		
	1. Review preliminary data and status.	April 2004	COMPLETE
	2. Review report.	April 2005 December 2005	GREEN
	3. Make recommendation for dissemination of information, if appropriate.	July 2005 December 2005	GREEN
	<u>K. Pulse Arrested Spark Discharge</u>		
	1. Review preliminary data and status.	April 2004	COMPLETE
	2. Review report.	July 2005	COMPLETE
	3. Make recommendation for dissemination of information, if appropriate.	October 2005	COMPLETE (Publish report. No recommendations.)

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12.2 (continued)			
	L. <u>Terahertz Reflectometry</u>		
	1. Review report.	October 2004	FAA terminated program due to unsatisfactory results.
	2. Make recommendation for dissemination of information, if appropriate.	January 2005	
	M. <u>Wire Degradation Research</u>		
	1. Review preliminary data and status.	April 2004	COMPLETE
	2. Review final report.	April 2005 June 2005	COMPLETE
	3. Develop recommendations.	October 2005	COMPLETE (Good data. No recommendations.)

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<u>SUB-TASK#</u>	<u>DESCRIPTION</u>	<u>ESTIMATED COMPLETION DATE</u>	<u>STATUS (RED/GREEN/YELLOW)</u>
12.3 Explore additional opportunities to promote cooperative efforts and partnerships valuable to achieving EWIS R&D objectives.	<u>A. Micro Energy High Voltage Wire Tester</u>		
	1. Identify maintenance personnel to participate in a blind test of the system.	September 2003	COMPLETE
	2. Make recommendation for dissemination of information, if appropriate.	June 2005	COMPLETE (Publish report. No recommendations.)
	<u>B. Advanced Risk Assessment Techniques for Aircraft EWIS</u>		
	1. Review preliminary data and status.	January 2004	COMPLETE
	2. Identify organizations to participate in reviewing/testing potential techniques. (Cessna and ACO).	April 2004	COMPLETE
	3. Provide preliminary tester feedback to FAA. Project delayed 6 months. Beta testing starts in October 2004.	July 2004 April 2005 June 2005	COMPLETE (One recommendation for further development)
	<u>C. NOVA Test System</u>	CANCELLED	COMPLETE (Made Recommendation)

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12.3 (continued)

D. 3-Phase and 28VDC AFCB

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| 1. Review preliminary data and status. | December 2003 | COMPLETE |
| 2. Review status and make plans. | October 2004 | COMPLETE
(Made Recommendation) |
| 3. Continue to monitor progress. | On-going | GREEN |

E. Identify other opportunities

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| 1. Fiber Optical Chafe Detection (Navy and others) | On-going | COMPLETE
(Now with the Navy) |
| 2. NASA proof of concept wire repair | On-going | GREEN |
| 3. Discussion of /16 wire suitability. | July 2004 | COMPLETE
(Made Recommendation) |
| 4. Wire Flammability Report | June 2005 | COMPLETE
(Made three
recommendations) |

Recommendations:

An Evaluation of the Flammability of Aircraft Wiring DOT/FAA/AR-TN04/32

- 1) Further testing should be performed using *SAE AS 22759/87* 20awg wire.
- 2) Further testing should include a better definition of the flame including gas pressure, flame tip temperature, center flame temperature, gas used, type of gas, length of flame, nozzle used, color of flame, defined tolerances, etc. Do not use tie wraps in location of flame although they may be necessary to maintain the geometry of the bundle.
- 3) The end result of this work should be information for further guidance material.

Development of an Electrical Wire Interconnect System Risk Assessment Tool DOT/FAA/AR-xx/xx

Recommendation to the FAA that they continue research toward further development of this tool since it shows promise for industry-wide applications. Also, continue effort towards standardization of nomenclature used by this tool, where applicable.

Extended Material Testing Research and Technical Enhancements of IPAM3 Equipment for Determining Aging of Wire Insulation in Aircraft

Recommendation that the report be published and distributed, but no further research be done in this area.