

ATSRAC: Background, Results and Future Impact on the Aviation Industry

presented to

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Systems Engineering Conference

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Who is ATSRAC?

→ Aging Transport Systems Rulemaking Advisory Committee

➤ Initially chartered 19 January 1999

➤ Re-chartered:

➤ 25 January 2001

➤ 28 January 2003

➤ 21 January 2005

➤ See www.mitrecaasd.org/atstrac/index.html

Background

- ✈ Two major 1996 accidents caused national USA attention to aviation safety
- ✈ Growing number of flights will create more accidents, even with a lower rate
- ✈ White House Commission on Aviation Safety and Security - 22 August 1996

Gore Commission Report

- ✈ Final Report published 12 February 1997
- ✈ 1.9 In cooperation with airlines and manufacturers, the FAA's Aging Aircraft Program should be expanded to cover non-structural systems

Initial ATSRAC Members

Chairman: Kent Hollinger

- ✈ FAA
- ✈ DoD
- ✈ ALPA
- ✈ ATA
- ✈ AIA
- ✈ NASA
- ✈ GAMA
- ✈ Flight Safety Foundation
- ✈ JAA
- ✈ Transport Canada
- ✈ AECMA
- ✈ General John Loh
- ✈ Boeing
- ✈ Airbus
- ✈ NEMA
- ✈ SAE (DuPont)

Added ATSRAC Members

- ✈ AirTran Airways
- ✈ Dassault
- ✈ IATA
- ✈ IAM
- ✈ International Federation of Airworthiness
- ✈ NADA/F
- ✈ NBAA
- ✈ Northwest Airlines
- ✈ Garrett Aviation Services

Initial Five Tasks

- ✈ Sampling inspection of the fleet
- ✈ Review of fleet service history
- ✈ Improvement of maintenance criteria
- ✈ Review and update standard practices for wiring
- ✈ Review air carrier and repair station inspection and repair training programs and recommend actions to address aging systems

Status of Initial Tasks

- ✈ All tasks are complete
- ✈ ATSRAC approval of Final Reports during January 2001 meeting
- ✈ Final Reports with recommendations forwarded to FAA

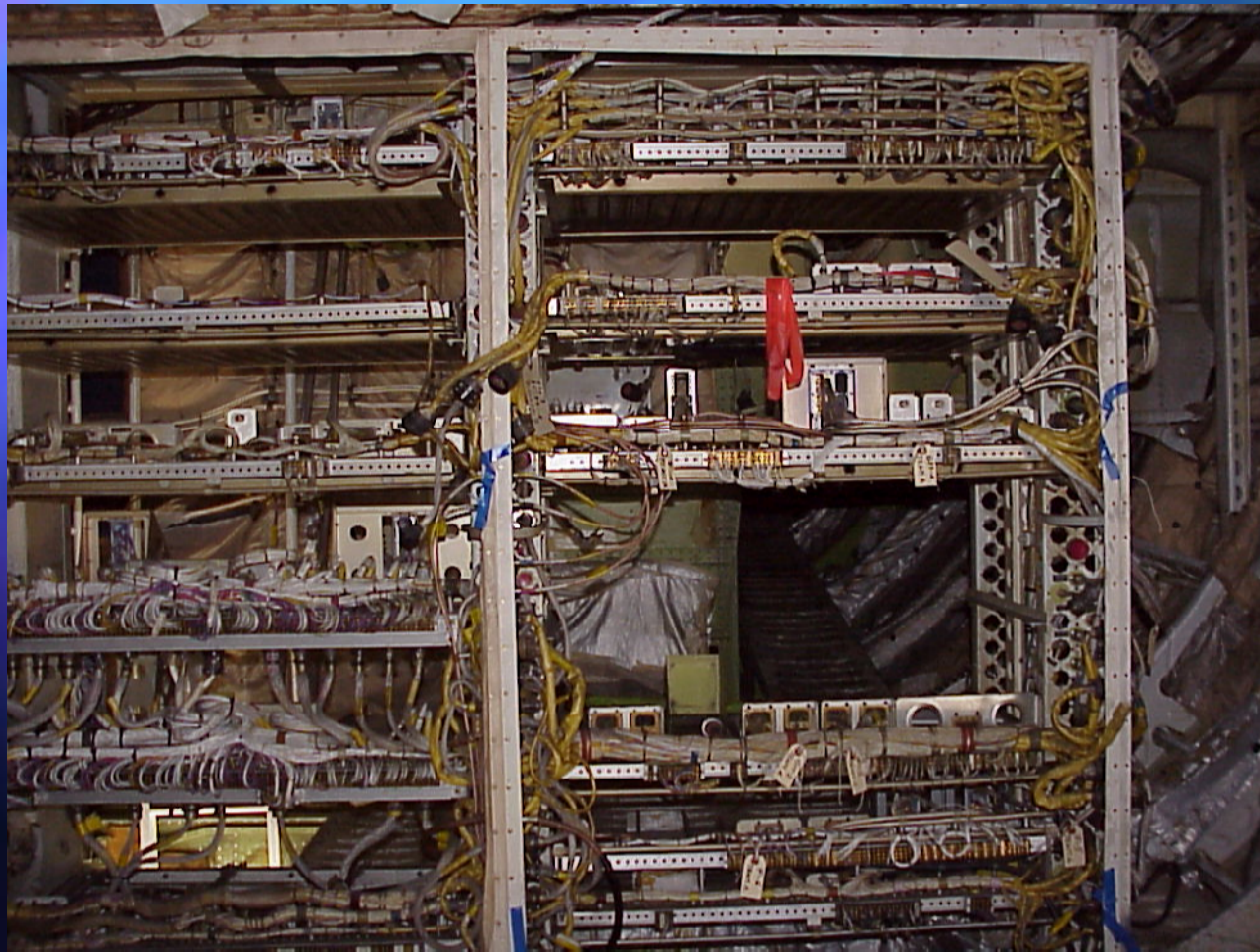
Task 1 Results

- ✈ Non-intrusive Inspections of 81 aircraft
 - Aged up to 82,000 hours and 92,000 cycles
 - 3,372 individual discrepancies (sorted by risk)
 - Immediate Fleet-wide Safety of Flight Concern – 0
 - Potential Hazard or Frequently Occurring Item - 182
 - ➔ SB's required for 3 and enhanced inspection guidelines for 2
 - Defects noted - 3,190

Task 1 Results (continued)

- ✈ Intrusive Inspections of 6 retired aircraft
 - Aged up to 100,241 hours and 100,017 cycles
 - Targeted specific wire types and aircraft zones
 - On-board visual inspection and NDT
 - Wires removed and 25 laboratory tests applied
 - Recommendations:
 - ✈ 1 general - education of inspection & maintenance personnel
 - ✈ 9 research - degradation, chaffing, contamination, NDT, AFCB
 - ✈ 90 specific - splices, heat shields, clamping

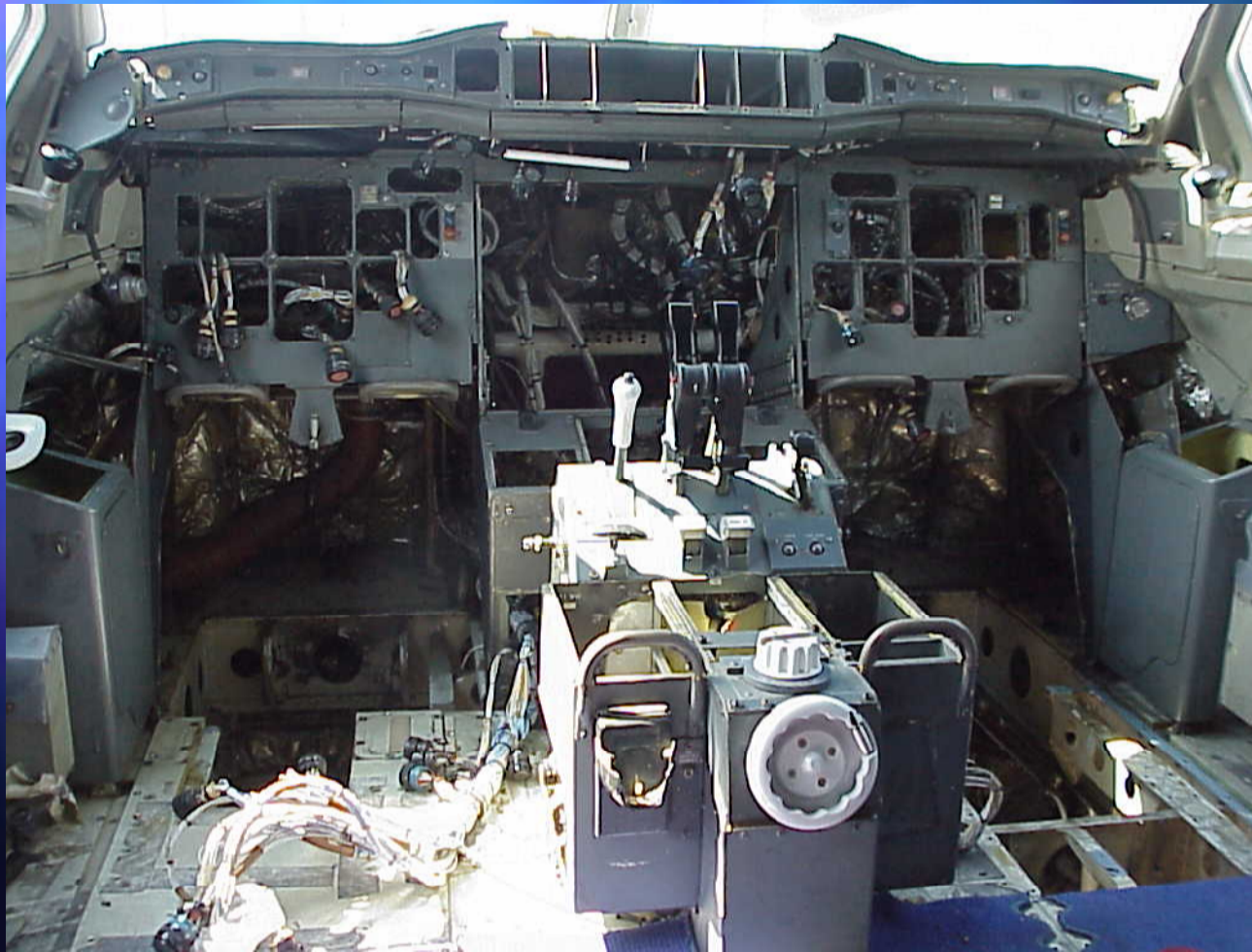
Typical Aircraft Zones (1 of 4)



**B747
Electronics
Rack,
E&E Bay**

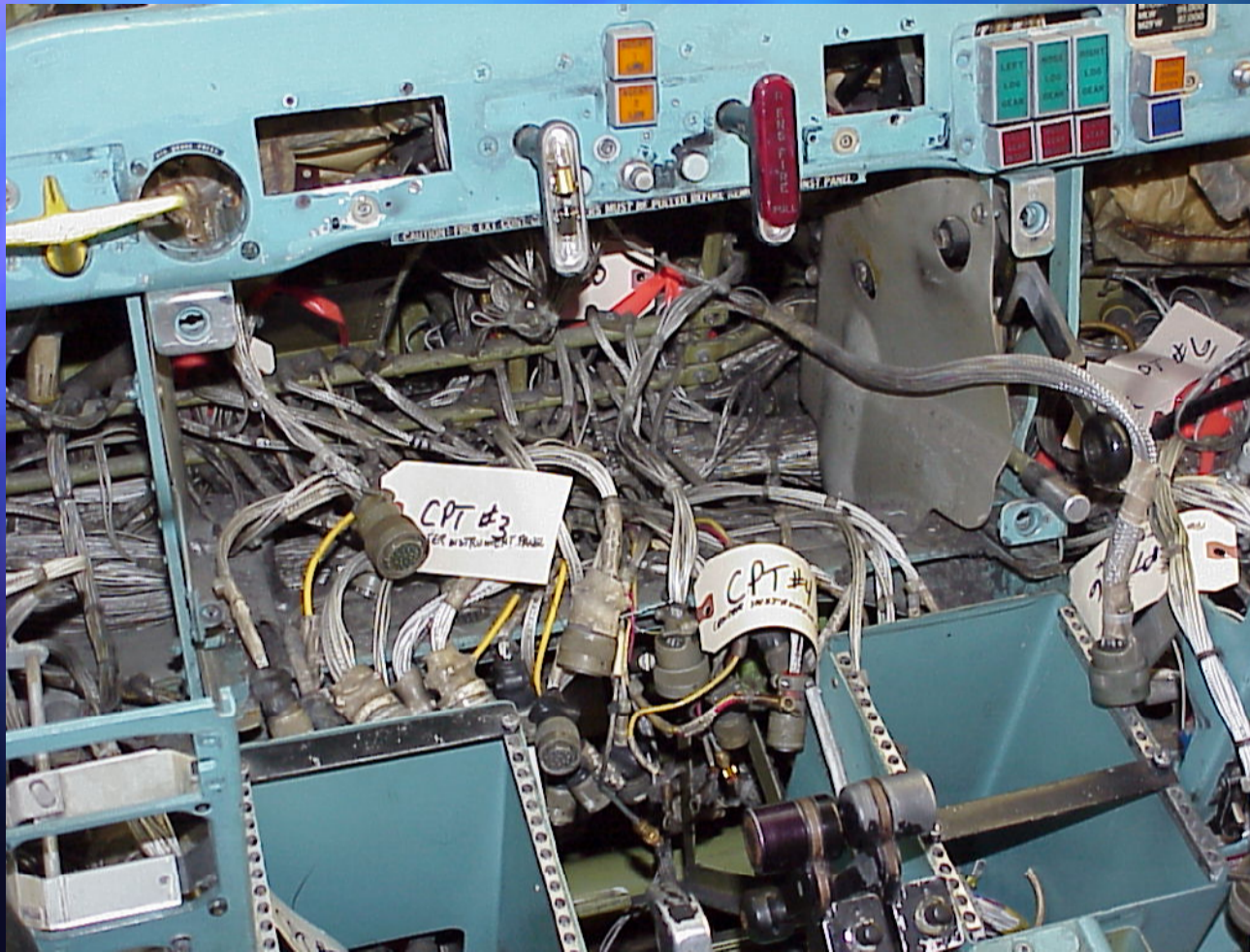
ATSRAC

Typical Aircraft Zones (2 of 4)



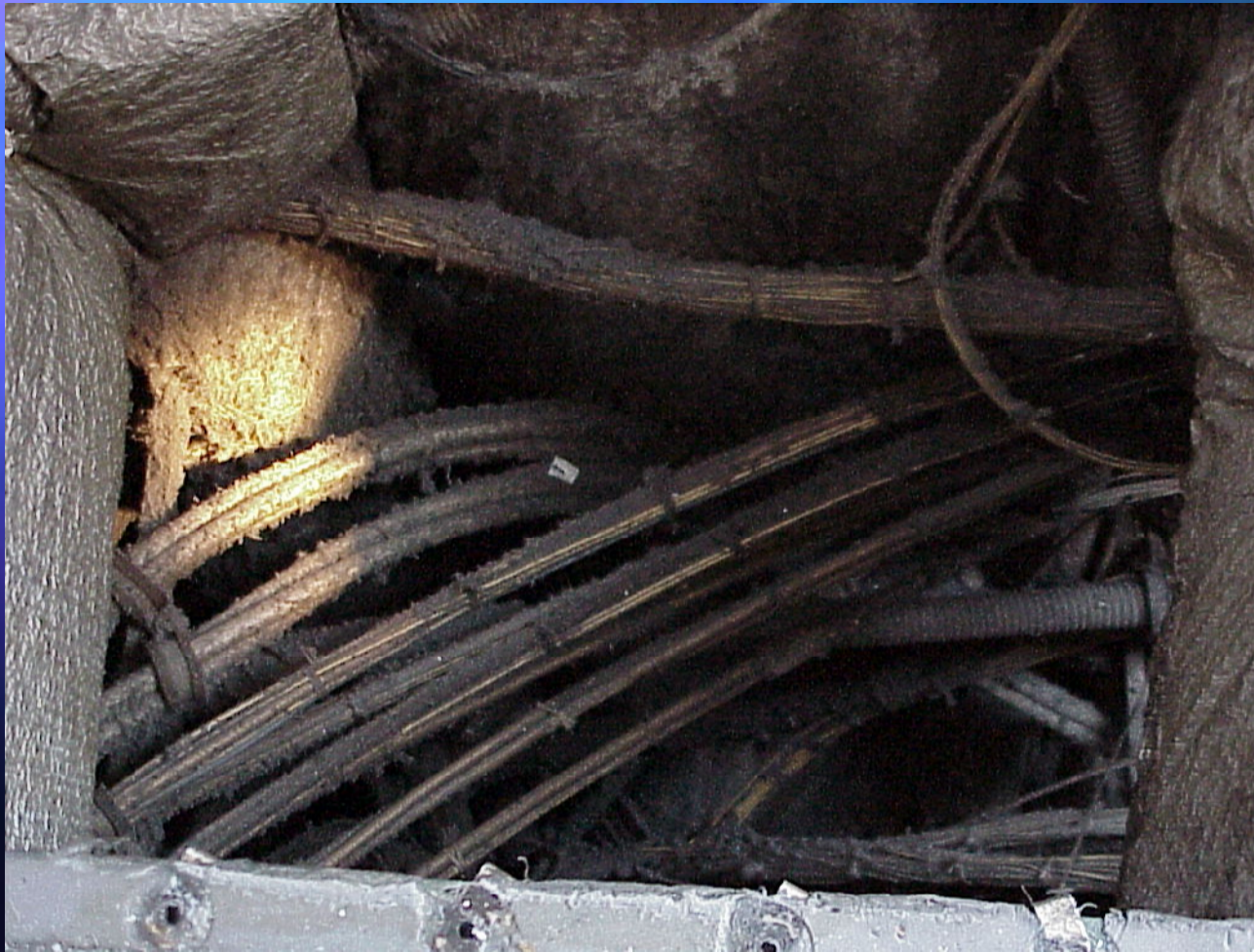
**A300
Cockpit**

Typical Aircraft Zones (3 of 4)



DC-9
Cockpit

Typical Aircraft Zones (4 of 4)



**L1011
Under
Floor Panels**

Defects Found by NDI



Hot Stamp Damage



Installation Problems



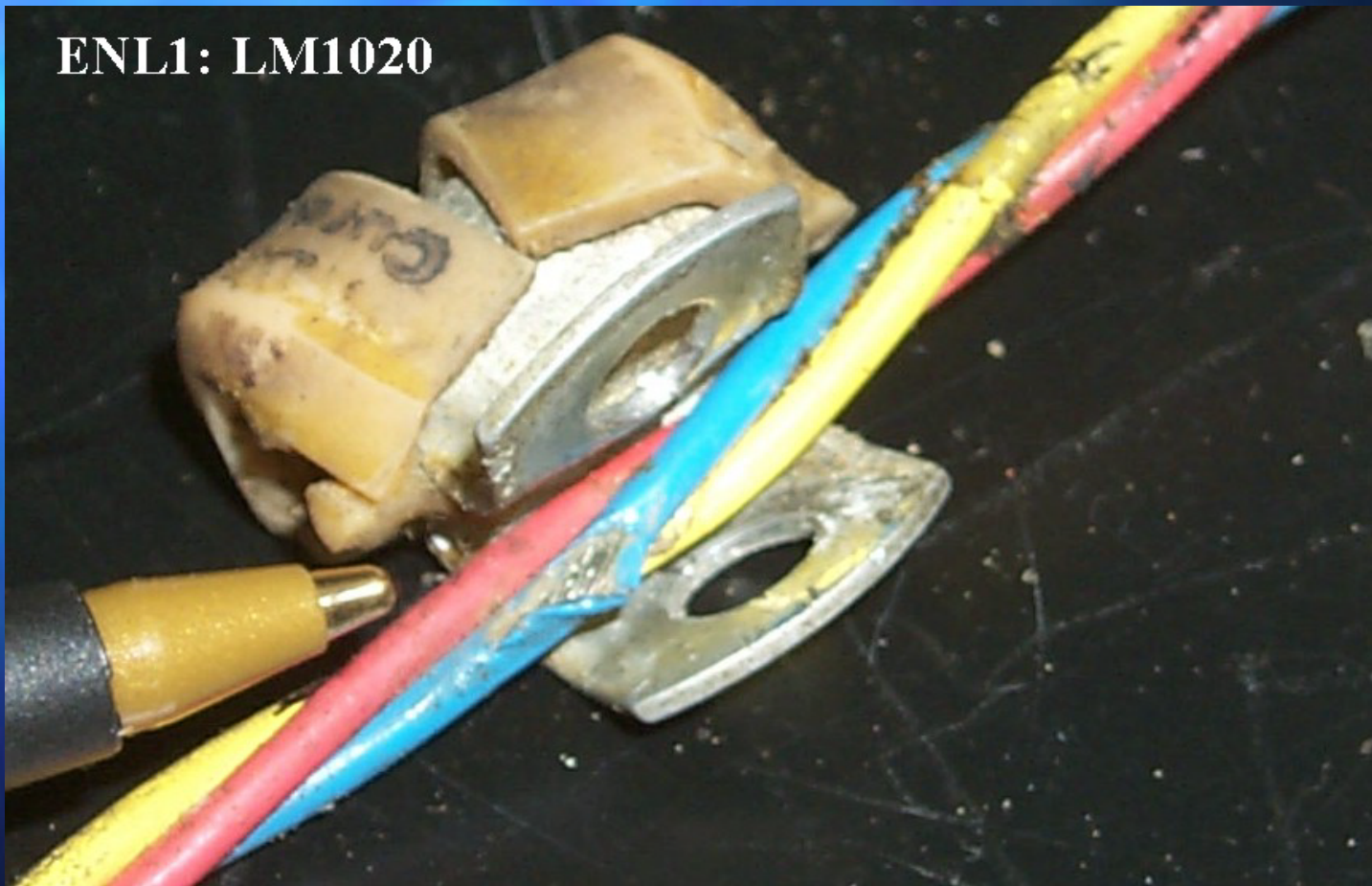
Contact with hot duct



Power feeder chafing

Clamping Problem

ENL1: LM1020



Further Information

✈ Intrusive Inspection Report available at:

http://www.mitrecaasd.org/atstrac/intrusive_inspection.html

Task 2 Results

- ✈ Reviewed 714 Service Documents
 - Boeing - 27 upgraded to Alert status
 - Airbus - 3 upgraded to Alert status
 - Lockheed - no further action required

- ✈ Reviewed 79 ADs with repetitive inspections
 - Recommended 8 for terminating action

Next Four Tasks (Phase II)

✈ Federal Register 29 May 2001 p. 29203

- Wire system certification requirements
- Standard format and content of SWPM
- Enhanced training program for wire systems
- Enhanced maintenance criteria for systems

Status of Phase II Tasks

- ✈ All tasks are complete
- ✈ Final Reports with recommendations forwarded to FAA in 2002
- ✈ Small airplane recommendations forwarded to FAA in January 2003

Task 6 Results

- ✈ Created new FAR 25 Subpart H for Electrical Wiring Interconnection Systems
 - Consolidated current wiring regulations
 - Wire system separation
 - Wire system identification
 - Wire system safety assessments

- ✈ Revised current FAR 25 sections and created Advisory Circulars

Task 7 Results

- ✈ Defined minimum content for Electrical Standard Wire Practices Manual (ESWPM)
- ✈ Defined standard format for new ESWPM
- ✈ Created a Master Breakdown Index (MBI) for use with existing ESWPM

Task 8 Results

- ✈ Created an Advisory Circular titled "*Aircraft Electrical Wiring Interconnection Systems Training Program*"
- ✈ Applicable to air carriers, maintenance providers, OEMs and STC holders
- ✈ Voluntary incorporation is encouraged

Task 9 Results

- ✈ SFAR to require OEMs to implement and communicate an Enhanced Zonal Analysis Program (EZAP) to airlines
- ✈ Created Special Maintenance Program Requirements for >30 seat airplanes
- ✈ Created new FARs to require training on electrical systems (see AC from Task 8)

Current HWG#12

- ✈ Numerous recommendations to FAA:
 - Industry standard for EWIS routing
 - Aging circuit breakers (cycling by industry)
 - Arc Fault Circuit Breakers (AFCB)
 - Effects of additives on wiring qualification
 - Maintenance training requirements
 - Improved shield terminators

Current Schedule

- ✈ Notice of Proposed Rule Making (NPRM) scheduled for 6 October 2005
- ✈ Final Rules and Advisory Circulars are expected by year end 2006
- ✈ Inclusion of airplanes with <30 seats is required for new designs but is still under consideration retroactively (ATSRAC split)

Future Public Meetings

- ✈ 10 – 12 January 2006 @ ATA
- ✈ 4 – 6 April 2006 @ Airbus North America
- ✈ **Sunset** of ATSRAC

Are There Any

Questions?