The Research Aviation Facility

Meeting Challenges: Acting like a large organization when we are not so big….

Jeff Stith
RAF Manager

NCAR

NSF/NCAR C130 Research Aircraft

Atmospheric Boundary Layer Surveys

Oceanographic Investigations

Air/Sea Interaction Measurements

Cloud Physics Studies

Tropospheric Profiling

Radiometric Measurements

Atmospheric Chemistry Sampling

Aerosol Measurements

- 10 Hours Endurance
- Range 3100nmi
- Max Operating Altitude 26,000 ft
- 23,000 lb (13,000 with max fuel)
- Electrical Power
  - 40 kVA @ 115 Vac 400 Hz;
  - 28 kVA @ 115Vac 60 Hz;
  - 400A @ 28 Vdc

Photo courtesy of Tony Clarke, Univ. of Hawaii

NSF/NCAR G-V Aircraft

- 6000 lbs science payload
- 6000 nautical miles
- 51,000 max altitude
- South Pole and back

- Six under-wing hardpoints
- Up and Down (2) Co-Aligned 21 inch optical viewports
- Several Aperture/inlet locations
- Flexible seat/rack system
- Over $14 M in instrumentation
- New technology data system

NCAR

What we do:

- Airborne Measurements
- Research
- Support for Visiting Scientists
- Software Development and Data Processing
- Field Support and Project Management
- Aircraft Flight Operations
- Aircraft Maintenance and Modifications
- Instrument Development

RAF Staff

Administration Dr. Jeff Stith Gerry Albright Shannon Aguilar	**Science** Dr. Dave Rogers Dr. Julie Haggerty (+RAL) Dr. Jorgen Jensen Dr. Don Lenschow (+ MMM) Dr. Teresa Campos (+ACD) Dr. Britton Stephens (+ TIMES) Dr. Al Cooper Dr. Cindy Twohy (+OSU) Dr. Jeff Stith Dr. Jacob Fugal (+ASP)	**Technicians** Kurt Zrubek Bill Irwin Larry Murphy Hung Viet Ta John Cowan Dave Allbee Greg Bruning Andy Watt John Munnerlyn
Safety Committee Lowell Genzlinger Mark Lord Allen Schanot Bill Irwin Bob Olson Dr. Teresa Campos Gerry Albright Melinda Powers (Dir. Office)	**Aircraft Maintenance** Bob Olson Bob Beasley Brent Kidd Jason Morris John Cusack Kip Eagan	**Optical and Electrical Engineering** Dr. Mike Spowart Dr. Stuart Beaton
Flight Operations Henry Boynton Lowell Genzlinger Ed Ringleman Kip Eagan John Cusack	**Aeronautical Engineering** Mark Lord Velimir Randic Kurt Zrubek	**Project Management** Dr. Jorgen Jensen Ron Ruth Janine Goldstein Allen Schanot Dr. Pavel Romashkin

- A national resource for the advancement of airborne research in the geosciences.
- Conducts and improves fundamental airborne measurements of broad interest to the geosciences.
- Supports the NSF Geosciences Airborne Research Needs

1. Needs identified based upon a National Aircraft Facility Survey in 1963
2. Established 1965
3. First field deployment in 1967
4. Needs have remained consistent

Challenge: Act like an airline (but use different rules)

- Government Aircraft Operate Under (some) Different (and additional) Rules than Civil Aircraft
  - NSF aircraft: Perhaps the smallest fleet in the Government!
  - Show effective utilization (difficult for non-standard operations!)
  - Show safe operations
  - Procure, modify, operate according to multiple standards and regulations (Public and Civil)
  - Don't compete with private sector
- Increasing/changing regulations, oversight, and reporting requirements in line with agencies with large fleets of aircraft
- Difficult fit for a small fleet/small staff. Expand staff at NSF or ask more of NCAR? Hard to justify.
- Every mission is different—equal time to "build" a payload as to fly it. System not setup for this.

EOL Deployment Development Data Services

NCAR

Elements of an Aircraft Safety Program

National Transportation Safety Board
Washington, D.C. 20594

Safety Recommendation

Date: April 23, 2004

In reply refer to: A-04-29 through -33

Honorable Ann M. Veneman
Secretary
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Background

Accident History – In-Flight Breakups of Firefighting Aircraft

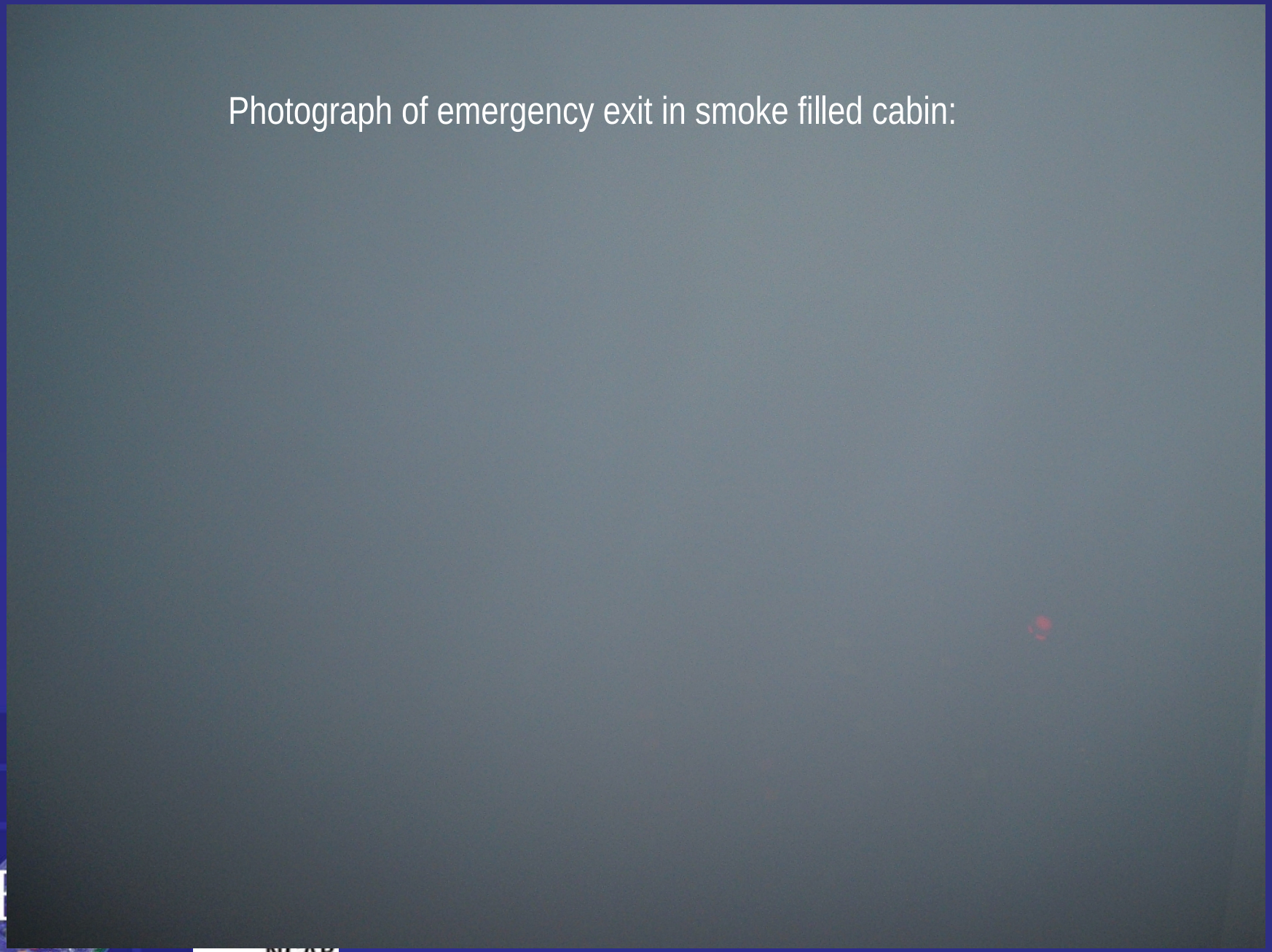
This report describes the causes of the recent crashes of fire fighting aircraft—one was based 50 yards from the RAF. It documents the need for a proper corrosion-based inspection program.

- Progressive corrosion-based Mx program
- Professional training standards for all flight crew
- Safety Risk Assessment program
- Risk Management Program
- Working Safety Committee
- Regular Review of Safety procedures
- Safety Program for Participants: All aspects of Safety

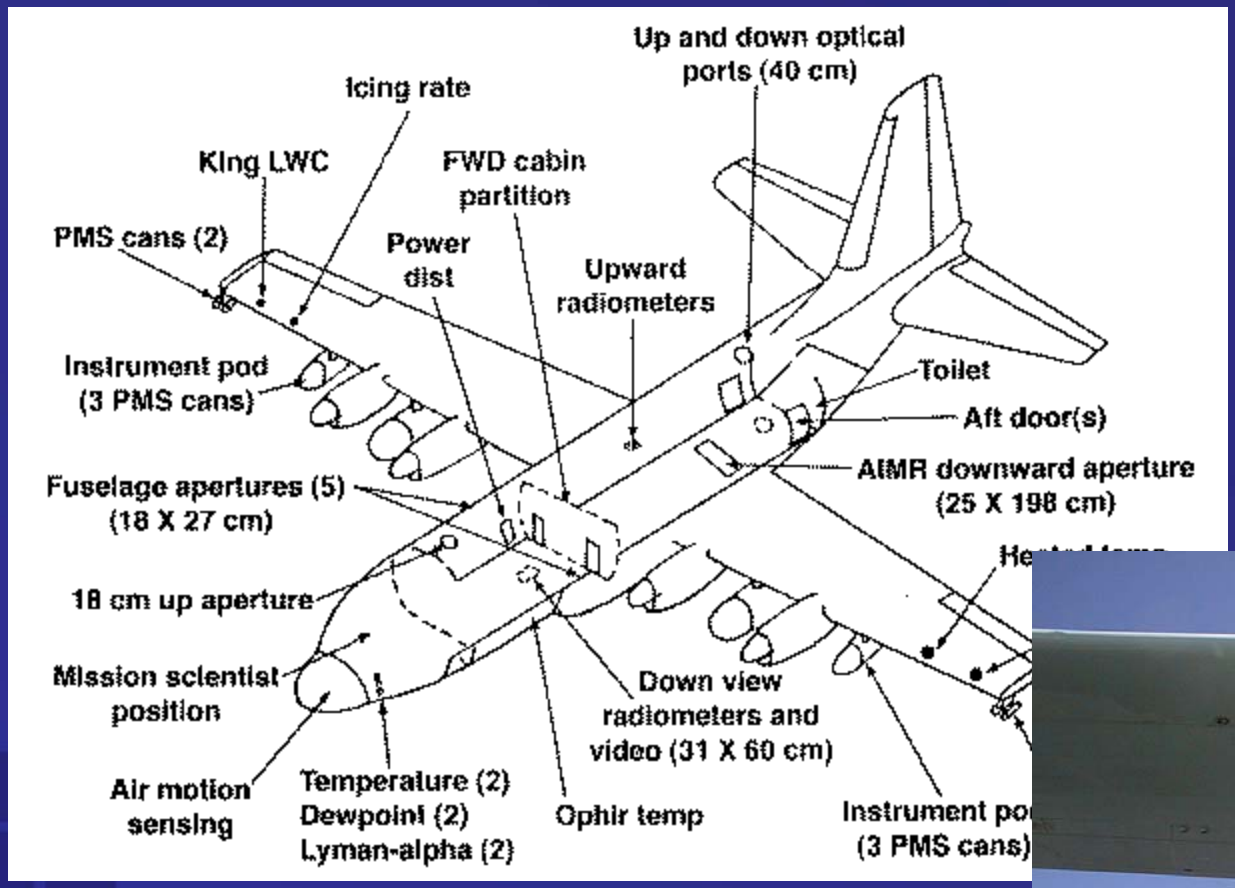
Crew Training: Cabin Evacuation in Smoke

EOL
Deployment
Development
Data Services

Photograph of emergency exit in smoke filled cabin:



Challenge: Act like an aircraft manufacturer--build new parts for aircraft (and get them approved by the FAA)



Strategy:

1. Highly skilled engineering
2. Access to first-rate design and build
3. Selective outsourcing

Challenge: Conduct expeditions all over the world

- Specialized Project Management
- Two-year+ planning process
- Challenges:
  - Risk Management: Cost, mission success, safety
  - Shipping
  - Export Regulations (esp. post 9/11)
  - Cost factors (read: jet fuel)
  - Diplomatic Clearances
  - Access to airspace
- Getting government agencies from many countries to agree to support the project: Priceless!

A community-driven approach

Reflects fundamental NSF and NCAR mission

- Provide unique facilities that meet specific community needs
  - **Challenge**: ***<u>Understand these needs</u>***
- Provide unique capabilities
  - Design and build capabilities
  - Set safety standards and certification
  - Develop new instruments in critical areas
  - Develop new methods for conducting field exploration
  - Develop tools for educational use
  - **Challenge: Setting priorities**

The Greatest Challenge: To bring state of the art measurements to the broad community

- Getting the best specialists
  - Hint: they are not all at NCAR (but some are)
- Develop partnerships to bring measurements/capabilities on-line (not just for specialists!)
  - Why would they want to collaborate with NCAR?