

Performance Tools and Measurements Breakout

6th Annual FAA/NASA Risk Analysis Workshop

Arlington, Virginia

August 19, 2004

What's being done

- Rutgers University
 - Developing a risk model for identifying causal factors and their interactions. Why do they interact the way they do?
 - Building causal models – able to evaluate effectiveness of interventions.
 - Use Subject Matter Experts to get out of the lab and into the field
 - Operational experience is so important. Understand real life and not just theory. What was the norm yesterday, may not be today.
 - Industry should also take advantage of work in academia.

What's being done

- Action Item Database

- Runway Safety Action Team meeting – what's going on at the airport.
- Action Items recorded in database – alerts when due date is approaching.
- Holds people's feet to the fire.

What's being done

- Helicopter Maintenance Malfunction Information Reporting System
 - Online – Automated – Free
 - Fulfills all SDR requirements
 - Sanitizes data for use by all operators
 - Does away with “We’ve never heard that before”

What's needed

- **ASAP's and ASRS'**
 - ASAP and ASRS forms for ramp personnel – ground ops
 - Automated/electronic submission of any ASRS report
 - Electronic dump from ASAP, ASRS
 - Should we differentiate between dispatchers and pilots?
 - ASRS form revised to make it more useful for maintenance personnel.
 - Need more input into ASRS from mechanics
 - People have to buy-in. Must feel the data will be handled properly. Some companies still want to retain maintenance “stick”. A culture shift required.
 - Would like to see ASAP extended to repair stations – to industry as a whole.
- **A risk assessment tool that would id the biggest thing on your list and tell you how long you have to fix it.**

What's needed

- DB mining techniques that tell why, not just what happened.
- NASA – We have a program to increase capacity and a safety program, but no mechanism to evaluate capacity increase ideas through the safety program.
- Quit reinventing the wheel. Mechanism to find out what is available.
- Ultimately we need tools to help us analyze and share the disparate data that exists.

What's needed

- Risk Assessment Alternatives Analysis Tool. Be sure we aren't just moving the problem around.
- Tools to ensure the appropriate level of risk is assigned to reported incident
- Aircarrier version of MMIR – airlines don't have access to manufacturers incident databases – liability issues

Issues and Concerns

- Human Factors

- Why so little attention to error and error recovery when so many problems are caused by human error?
- Most accidents caused by failure to follow procedures
- Many technology solutions result from addressing human error
- The difference between an accident or not is recognizing that something is wrong in time to do something about it.
- Training can help – knowing what to do is crucial
- Design involves making assumptions – training is sometimes needed to overcome design assumptions

Issues and Concerns

- Safety and costs
 - Airlines have to hold down costs. Tool developers need feedback to insure their tools are cost effective, easy to use, and require no more than a high school education. Come down to reality.
 - A jetway tool that costs as much as a jetway is not going to fly
 - We are not always good at measuring what safety costs.
 - Easier to sell a solution for something that is happening now than for a rare event that may happen in the future.
 - Savings are tied closely with finance and insurance.
 - Alaska Air has an accounting system that captures a lot of indirect costs. Would like to know more about it.
 - There are also political costs to consider.
 - The Safety Office needs to find out what other organizations are capturing as costs – not always easy to do.

Issues and Concerns

- Sharing of Information

- Tools – with sharing, there has to be a standard so we can compare apples to apples, but we also need flexibility to go beyond the standard set to address the different ways we work.
- How do we collect info from airline to airline when it's not the same format – incompatible databases.
- Data mining tools may help, but we're still not there.
- How do we collect data and make sure it is all relevant?
- Do insurance companies have information that could be useful?

Issues and Concerns

- The Spinning Cheese Problem
 - What is true today, may not be true tomorrow. FOQA deals with yesterday. How do you get ahead? What triggers going back?
 - How we measure risk should look at what barriers exist and which were breached.
 - Does anyone track data and associated defenses that might indicate a previous defense has been breached?
 - Have tried to analyze the size of the holes in each defense.

Issues and Concerns

- Rare Events

- Is there a way to prevent in advance a very rare event that really isn't so rare due to the number of aircraft involved?
- Need to think laterally
- Human factors is a major part of the problem.
- There is a lot of operational data to be mined.
- Types of mitigations to prevent rare, catastrophic incidents:
 - Training
 - Automation
 - Redundancy
- Need more tools for modeling corrective actions.
- Need more simulation time to evaluate safety changes and avoid unintended consequences.
- Outliers can send you in the direction of the rare event.
- With the rate low, the spotlight will fall on any occurrence. It's even more important to avoid future accidents.

Issues and Concerns

- General Aviation
 - GA builder/operator – What preflight risk evaluation processes used by the commercial airlines could help us score the various inputs that go into deciding if it's safe to make this flight?
 - Maintenance Release Procedures could be translated into GA policies and procedures.
 - Minimum equipment lists – represent an ongoing risk assessment tool.
 - “Stress Point Flight Check for GA”