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Sifting Lessons from the Ashes: Avoiding Lost Learning Opportunities

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ISASI 2009 Seminar

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Key insights we learned from our study:

Prevention results from changed behavior
Need formal structure for investigation data
Behavior sets analysis is essential
Users need a lessons learning system
We need a metric for prevention efforts

ISASI's Motto: "Safety Through Investigation"

ISASI 2009 Seminar Theme: "Accident Prevention Beyond Investigation"

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What do we mean by Lessons Learned?

- *Lessons* = Behavior patterns that produce undesired outcomes
- *Learned* = Applying lessons to change those behavior patterns to prevent recurrence of undesired outcomes

How Effective Have We Been Learning and Applying Lessons to Prevent Accidents?

How Effective Have We Been Learning and Applying Lessons to Prevent Accidents?

NOT VERY!

Retrocursors

Retrocursors

• Are incidents and accidents that repeat behavior patterns from earlier incidents or accidents

• Are a valid *METRIC* for measuring prevention effectiveness

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Retrocursor Accidents in the Past Year :

- JK5022: MD-80 Madrid ES
- CO3407: DHC8-402 Buffalo NY
- TK1951: B-737 Amsterdam NL
- FedEx N526FE: MD-11 Narita JP
- AF447: AB-330-200 Atlantic Ocean
- NMSP: Ag-109A near Santa Fe NM
- Sayano-Shushenskaya Powerplant RU

"... never ... captured in 'lessons learned' reports."

-- from USAF Accident Report





Organizations with Specific Lessons Learned Procedures

- FAA ASIAS Aviation Safety Information, Analysis and Sharing Center
- NASA ASRS Aviation Safety Reporting System
- DoD CELL Center for Engineering Lessons Learned
- Army CALL Center for Army Lessons Learned
- DoE SELLS = Society for Effective Lessons Learned Sharing

- NASA LLIS Lesson Learning Information system
- USGS Earthquakes
- NIOSH Medical Devices program
- OSHA -Safe Tank Alliance program
- Wildland Fire Lessons Learning Center
- DoT RITA Research and Innovative Technologies Lessons Learned Reports For Programs

Needed: A genuine Lessons Learning System

Goals for Lessons Learning Systems:

- Capture all lessons to be learned from accidents
- Structure lessons as "Behavior Sets"
- Produce lists of explicit "Lessons to be Learned" in investigation reports and repositories
- Make the Lessons-to-be-Learned easily accessible to all potential end users

What is a Behavior Set?

A description of an interactive behavior among people, things or energies during accident or incident processes

EACH BEHAVIOR IS A BEHAVIORAL EVENT BLOCK



Who are End Users?

- Equipment designers & manufacturers
- Aviation system operators
- Supervisors & managers
- Trainers & procedures writers
- Safety analysts

What is needed? Lessons that are tailored to Users' Needs

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What DO Users Need?

- Behavior set data from accidents or incidents, compatible with their dynamic operations
- Information that enables them to match accident behavior set data to behavior sets in their operations
- Timely and efficient access to accurate accident behavior set data

Lessons Learning System Objective:

Changed behavior in dynamic operations to prevent known risks from recurring.

Lessons Learning System Metric:

Number of occurrences of "Retrocursors"

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	OLD VIEW	NEW VIEW
Learning System Focus?	Causes	Behavioral interactions
Needs served?	Investigators	End users
Who defines lesson?	Analysts	Investigators
What is product?	Recommendations	Lessons list
Lesson accessibility?	Limited	Universal

Priorities for Change

As of 7/1/2009 Paper Submission

- Redefine investigation data products to require that lessons learned be an explicitly documented output of investigation processes.
- Redesign the form and substance of lessons-tobe-learned source data to improve their usefulness for end users.

More insights recognized

since 7/1/2009 paper submission

- Structured input data criticality
- Social networking impact
- Digitized operating data potential

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• and more...

New Open Source (LGPL) Library:

http://code.google.com/p/meslib/

OPEN SOURCE = there for you to use free...

The Library needs contributions of updates. Derivative applications are invited. Add your ideas to this public library!

See handout for details

Bonus slides

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Boyd's OODA Loop



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Source: http://en.wikipedia.org/wiki/OODA_Loop

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The User's Part of the System





The Developer's Part of the System

