Line Operations Safety Audit (LOSA): A Practical Overview

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Introduction: James Klinect

• University of Texas (UT) – TEM/LOSA research
  – FAA funded research (AAR-100) (presentations and publications)
  – Director: Robert Helmreich (retired June 2007)
  – Role: TEM / LOSA Project Manager (1996-Present)

• The LOSA Collaborative (TLC) – LOSA implementation
  – Private organization - Home of the LOSA Archive (a.k.a., Archie)
  – Role: Founder and CEO
  – Also present, Stephen Ingham – Project Manager / Expert Observer
## LOSA Airlines: 1996-Present

5,647 flights crews on 6,977 observations in 36 airlines

| AeroMexico | Continental | Malaysia Airlines |
| Asiana | Continental Express | Mexicana |
| Alaska Airlines | Continental Micronesia | Mt. Cook |
| Air Freight NZ | Delta Air Lines | Regional Express |
| Air New Zealand | Emirates | Singapore Airlines |
| Air Transat | EVA Air | SIA Cargo |
| ANA | Frontier | Silk Air |
| Braathens | Horizon Air | TACA |
| Cathay Pacific | Japan Airlines | TACA Peru |
| China Airlines | JetBlue | UNI Air |
| Click Mexicana | LACSA | US Airways |
| COPA | QANTAS | WestJet |
Presentation Outline: Four Questions

• How does LOSA fit within the current SMS guidelines?

• What are the objectives for LOSA?

• What are the defining characteristics of LOSA?

• What are the most frequently asked questions about LOSA?
How does LOSA fit within the current SMS guidelines?

What are the objectives for LOSA?
• **Proactive** *(sec 5.1.2)* - The adoption of an approach which emphasizes prevention through the identification of hazards and the introduction of risk mitigation measures before the risk-bearing event occurs and adversely affects safety performance.
Has anyone wondered what kinds of safety tools can proactively measure the holes in the Swiss Cheese?
Using the Swiss Cheese safety concept, LOSA is a tool that searches for system safety performance…….

- **Strengths (+)**: Thick, no-hole cheese slices/sections

  AND

- **Weaknesses (-)**: Location and hole sizes in the cheese

**Measure** - Flight crew Threat and Error Management (TEM) performance

**Method** – Jumpseat observations in regular, everyday flight operations
Threat and Error Management (TEM)

- Threat Management
- Error Management
- Undesired Aircraft State Management

Everyday Operations (Routine flights)

1. Manage operational complexity
2. Manage their own errors
3. Manage aircraft deviations

- LOSA “proactively” identifies system safety and flight crew performance strengths and weaknesses using TEM as its safety measure
What are the defining characteristics of LOSA?
LOSA data quality is dependent on **methodology AND execution**

- Low pilot trust = Low quality LOSA data
  - Objective for LOSA is to get as close as possible to collecting natural flight crew performance data
LOSA: How to Gain Pilot Trust

1. Jumpseat observations during normal operations
2. Anonymous, confidential, and non-punitive data collection
3. Voluntary crew participation
4. Trusted and trained observers
5. Joint management / union sponsorship
6. Systematic observation instrument
7. Secure data collection repository
8. Data verification roundtables
9. Data-derived targets for enhancement
10. Feedback of results to line pilots

LOSA is defined by 10 operating characteristics
1. Jumpseat observations during normal operations
   • Routine flights only - no line checks or training flights
   • No debriefings or post-flight interviews asking crews why they committed so many errors and/or undesired aircraft states

2. Anonymous, confidential, and non-punitive data collection
   • No names, flight numbers, or other identifying information
   • Observer identity kept anonymous
   • Data used for safety purposes only – no disciplinary action

3. Voluntary crew participation
   • Flight crews have the right to decline a LOSA observation
   • Typical denial rate is very low – 1 per 100 flights
4. Trusted and trained observers
   – Observer selection – management/union list of candidates
   – Diverse observer team – Captains, First Officers, Flight Engineers, ground simulator instructors, and retired pilots
     • Training length (Five days)
       • Ground school (2), test observations (2) & recalibration (1)

5. Joint management / union sponsorship
   • Steering committee – Flight Ops, Training, Safety and Union
   • Symbolized with a signed agreement and sent to all pilots
6. Systematic observation instrument based on TEM
   - Observers record TEM events that they see and/or hear and then write narratives for contextual support

7. Secure data collection repository
   - Third party or pilot association gate keeper
   - Pilots must believe that observations will not be “misplaced”

8. Data verification roundtables
   - TEM data checked for coding accuracy and consistency with SOP
   - On completion, data analysis begins
9. Data-derived targets for enhancement
   • Serve as benchmarks for organizational change
   • LOSA adopts a “Measure, change, measure again” approach

10. Feedback of results to line pilots
    • LOSA findings and information on how airline management intends to respond to the findings with organizational change

    • To ensure standardization, LOSA must have all ten operating characteristics
      – If you have less than ten characteristics, then you have to find another acronym
      – Endorsed by: ICAO, FAA, IATA, IFALPA, and US ALPA
What are the most frequently asked questions about LOSA?
• Depends on a number of factors – indirect and direct costs
  – Number of observations to be collected
  – Number of external and internal observers
  – Depth of data analysis
  – External provider fee – LOSA Collaborative or other providers
  – Insurance discounts?

• Some “misleading” efforts to lower costs
  – Observations only – no roundtables or data analysis
  – Operating crew as their own observers / self report
  – Interviewing crews instead of observing performance
  – These projects might have value but they are not LOSA
Length and Size of LOSA?

• Project Length
  – Average 8 months from planning to a final report
  – Airline – 75% of time spent on planning
  – LOSA Collaborative
    • 30% of time spent on planning, observer training, data collection
    • 70% spent on data verification, analysis and final report

• Project Size – Want to extrapolate to everyday operations
  – Weighted sample to match daily departure rates per fleet
  – Minimum number of observations per fleet: 50 observations
  – Cap observers to no more than 15 observations
Current Sources of Information on LOSA

- FAA LOSA Advisory Circular (120-90) – Published in 2006
  - Best general information source on LOSA

- UT website – www.psy.utexas.edu/humanfactors
  - Research publications on TEM and LOSA
  - LOSA validation source: Klinect Ph.D. dissertation

- LOSA Collaborative Airlines – AeroMexico, Mexicana, Click, COPA, LACSA, TACA, and TACA Peru

- ICAO (Doc 9803) – Published in 2002 - TEM information presented is outdated
Muchas gracias