The Introduction of
LOSA characteristics and operation in Asiana.

노선안전운항감사(LOSA)특성및운영

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ABSTRACT

LOSA is spreading rapidly over the world to improve safety of the airlines using threat and error management system. LOSA has shown its success on the major improvement on many areas including the riskiest phase called the blue box, which is the busiest during approach and landing. Asiana Airlines has completed data collection in 2004 and round table for the data cleaning, to implement safety change process. The propose of this paper is to introduce the LOSA, ICAO DOC 9803, and the experience of Asiana.

I. LOSA INTRODUCTION

1. HISTORY OF LOSA AND ASIANA LOSA

The beginning of LOSA was initiated with Delta Airlines and UT to confirm the actual line application after the CRM training in 1994. TWA, US Airways, and American Airlines performed CRM audits with UTHF (The University of Texas Human Factors Research Project) after Delta. The first Threat and Error Management LOSA was developed in 1996 in collaboration with Continental Airlines. When they measured second LOSA in 2000, they found many improvements including 70% reduction in checklist usages. This success was recognized as industry best practice by ICAO.

The CEO and the managements of Asiana Airlines committed to participate in LOSA and share the information within the membership airlines after the 45th AAPA (Association of Asia Pacific Airlines) in 2001. Asiana sent the delegation to Dubai at the 3rd LOSA week on OCT 2002, and formed the preparation committee on MAR 2003 to implement LOSA on OCT 2004 for 230 sectors on B737, 767, 777, 747 and A321 for a month and a half.

Now we are waiting for the final reports

from TLC on May 2005. Initially 3 pilots(line and retired) have worked studying LOSA for full time for 3 month. After the management approved to form a prep committee, we formed 2 full time (1 line pilot, 1 admin staff) and 2 part time line pilots for the prep committee and independent office). When we formed LOSA committee, we added 10 more pilots a day per month. There were 2 more part time admin staff 1 month prior to LOSA data collection.

2. AIRLINE HEALTH CHECK

LOSA is like a cholesterol check during regular health check. LOSA gives a system check and diagnostic snapshot of safety performance. It uses normal flight observation on the backseat in the cockpit like a camera or a fly on the wall using threat and error management model. LOSA explains why errors happen and how it is managed while other conventional SMS gives what happened.

LOSA data is confidential, non-punitive, and voluntary crew participation to ensure the pilots trust the observations so that they show normal operations instead of "an angel performance" in a check ride.

Every airline should do LOSA regularly like physical check in order to find good and bad area of the flight operations and cure the symptoms. LOSA can give the numbers in detail in comparisons with other fleets and airlines for normal flight operations so the managers may know exactly what areas are weak and how bad it is in order to improve the safety systems and environment.

Asiana Airline implemented LOSA to check the safety status of the system in the line operations and to enhance threat and error management before introducing new fleet of Airbus 330 and as airline is growing larger. The insurance company recommenced LOSA to us as well. The insurance company are strongly interested in LOSA, since LOSA shows great successful results in other airlines, and accepted by FAA, ICAO, and IATA.

3. LOSA AIRLINES

There are around 25 LOSA user groups which airlines have done LOSA in the LOSA advisory board. LOSA airline share the experiences and information.

LOSA user groups are Continental Airlines, Continental Latin America, Continental Express, Gulfstream Express, Air New Zealand, Air Micronesia, Continental (2nd LOSA), Delta, USAir, Cathay Pacific Airways, EVA Airlines, Uni Air (Taiwan), Qantas, Braathens (Norway), Singapore Airlines, Silkair, Air Alaska, Air New Zealand (2nd LOSA), China Airlines, Aero Mexico, Malaysia Airlines, Asiana, Delta (2nd LOSA), US Air (2nd LOSA), and Mt Cook (NZ First "Regional").

We have visited EVA, QF, ANZ, SIA and MAS to benchmark LOSA. We have had good picture how to implement LOSA. All of them whom we visited are satisfied with LOSA to improve managing errors. We shared with JAL, ANA, KAL and Airbus human factors symposium on our experiences of the preparation of LOSA.

4. THREATS AND ERRORS.

4.1. THREATS

Threats are events or errors happened

outside the flight crew's influence, but need to be managed to keep safety. Threats increase the risk during the flight regarding safety. Errors caused out side of the cockpit crew are regarded as a threat. LOSA can help flight crew to manage threats when we know kinds of threats and how they effect on causing errors through training and systems. Threats originate but require their attention and management in order to maintain adequate safety margins.

There are average 4 threats per flight recently in 10 LOSA airlines according to TLC. Most frequent threats are adverse weather (26% of all threats) and ATC (21% of all threats). Around 25% of the flights had a mismanaged threat that lead to a crew error or undesired state. Around 25% of flights had an undesired aircraft states. Mismanaged undesired aircraft states are as close to accidents.

4.2. ERRORS

Error is an action or inaction by the cockpit crew that leads to deviations. Errors tend to reduce margin of safety and increase the probability of the accidents or the incidents. We make errors in the cockpit, because we are human and human is not perfect. LOSA helps in detecting errors in normal flight so we can learn from them. We can make safer flight when we know these errors. LOSA can help management to train and set up the system for crew to avoid committing errors, manage their errors, and manage undesired aircraft states.

There are average 3 errors per flight in recent LOSA airlines according to TLC. Over 90% of flights in LOSA had observable crew errors, and around 30% of errors are

intentional noncompliance (Violations). Most often mismanaged errors are Aircraft handling during hand flying, speed and vertical deviations, decision errors and automation errors. Around 50% of the errors went undetected .

4.3. THREAT AND ERROR MANAGEMENT MODEL (ICAO)

THREAT→THREAT MANAGEMENT→ CREW ERROR→CREW ERROR RESPONSES→UNDESIRED AIRCRAFT STATES→CREW UNDESIRED AIRCRAFT STATE RESPONSES→ERROR-INDUCED INCIDENTS OR ACCIDENT

4.4. UNDESIRED AIRCRAFT STATES

Most often mismanaged undesired aircraft states is unstable approaches on speed deviations in descent / approach / land. Over 25% of the flights had mismanaged errors that lead to an additional error or undesired aircraft state according to TLC.

5. 10 LOSA CHARACTERISTICS (ICAO PROCEDURE)

There must be 10 characteristics implementing LOSA according to ICAO DOC 9803. If any of these is missing, it does not meet the requirement of LOSA.
1) Jump seat operations during normal flight operations
2) Anonymous and confidential data collection
3) Voluntary flight crew participation
4) Joint management, pilot association sponsorship
5) Safety targeted data collection form
6) Trusted and rained observers
7) Trusted data collection sites
8) Data cleaning round tables
9) Data-derived targets for enhancement

10) Result feed back to line pilot

II. SETTING UP LOSA

1. MAJOR STEPS (ICAO PROC)
STEP 1: Form initial development team
STEP 2: Gather information
STEP 3: Identify what to look at
STEP 4: Determine how many segment to observe
STEP 5: Schedule audit dates, select observers and schedule training
STEP 6: Conduct observer training
AUDIT
STEP 7: Analyse audit finding
STEP 8: Provide feedback to system and carry out improvement to system
STEP 9: Develop enhanced policies, procedures and a safer environment
SAFER OPERATION

2. COMMITTEE
The support from other department is very important to have successful output from LOSA. Asiana LOSA Committee members are from safety, standards, flight operations, training department and pilot union. Quality assurance department is dealing the LOSA.

We had great support from committee members for the preparation and promotion of LOSA to line pilot for their participation in Asiana Airlines through monthly meeting. It was great to have aviation psychologist and regulators to be part of the special committee members for the maximum benefits and their professional support.

The committee suggested to make posters and stickers to promote the LOSA for active participation of the line pilots. The committee also suggested to give brief introduction at the recurrent ground school training, and pilots asked so many questions,

3. PILOT UNION

Through LOSA process, Asiana Airlines formed great relationship enhancing mutual target toward the safety. Pilot union guaranteed the confidentiality, non-punitive and voluntary participation to the pilots with the written agreement from the company as TLC requires. This made line pilot to open their cockpit doors to the observers to show their actual operations naturally.

In the early stage, pilot union questioned about LOSA if it is another form of line check to discipline proposes. The company asked pilot union to read the document from IFALPA and contacted other ALPAs and LOSA airlines as TLC advised. We selected the observers together and went to the round table in Austin Texas with the pilot union. Now we are getting great support from the pilot union completely opposite way then we started as a result from consulting with TLC.

IV. SAFETY CHANGE PROCESS (ICAO PROCEDURE)

1. MAJOR STEPS
MEASUREMENTS (DATA COLLECTION) →ANALYSIS OF TARGETS→LISTING OF POTENTIAL CHANGES→ RISK ANALYSIS AND PRIORITIZATION OF CHANGES→ SELECTION AND FUNDING OF CHANGES →IMPLEMENTATION OF CHANGES→ TIME ALLOCATION FOR CHANGES→ RE-MEASUREMENT→

2. SCP

The final report should be presented to managements in safety, operations, training, standards, quality assurance and related department.

3. Typical expected SCP actions (ICAO)

1) Modifying procedures or implementing new ones.
2) Redefining operational philosophies and guidelines
3) Arranging specific training in error management and crew countermeasures.
4) Reviewing checklist to ensure relevance of the content and then issuing clear guidelines for their initiation and execution.
5) Defining tolerances for stabilized approaches, as opposed to the "perfect approach" parameters promoted by exisiting SOPs.

VI.   REFERENCES

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