

The Introduction of LOSA and The implementation in Asiana Airlines.

노선안전운항감사(LOSA)운용 및 항공사내 운영

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I. LOSA INTRODUCTION

1. HISTORY OF LOSA AND ASIANA LOSA

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 phase during approach and landing.

Asiana Airlines has completed data collection in 2004 and round table for the data cleaning in 2005, to implement safety change process with TLC. The propose of this paper is to introduce the LOSA, ICAO DOC 9803, and the experience of Asiana

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. Asiana Airlines made LOSA data collection on OCT 2004 and data cleaning round table in 2005. Now we are waiting for the final reports from TLC on May 2005.

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. Also, the insurance company recommenced LOSA to us. They are strongly interested in LOSA, since LOSA shows great successful results in other airlines, and recommended by FAA, ICAO, and IATA. The insurance company has requested us to report on LOSA process on regular basis and valued the efforts to improve the system regarding flight safety.

IOSA audit from IATA also recognised that Asiana Airlines are making great efforts to improve systems of flight operations and to implement new forms of line audits which can reveal normal line operations, threats and errors.

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 Airlines, Delta (2nd LOSA), US Air (2nd LOSA), and Mt Cook (NZ First "Regional").

The preparation team of Asiana Airlines visited Airlines who implemented LOSA already to get informations for the preparation. All of the airlines welcomed the preparation team with LOSA spirit of sharing safety information. We have come to the conclusion that all the airlines we visited which have completed LOSA were satisfied with the safety change process with specific findings of LOSA data and comparisons that gives managements which area should be focused to be improved in detail and what direction they should train the crew to minimize the occurrence of threats, errors and undesired aircraft states. All the user group Asiana visited showed the good spirit of LOSA of sharing information to keep our sky safer and help each other out.

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.

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.

The pilots are trained to trap and avoid errors. However, 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.

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. 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 trained 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. Initially, 3 pilots (line and retired) have worked studying LOSA for full time for 3 month in Asiana Airline. 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). Asiana LOSA working committee was formed with 12 pilots (6 technical pilots and 6 line pilots) and 2 administration staff. There were meetings every month. There were 2 more part time admin staff joined 1 month prior to LOSA data collection for the final preparation.

STEP2: Gather information.

The preparation team of the Asiana Airlines have visited EVA, QF, ANZ, SIA and MAS to benchmark LOSA. Asiana LOSA prep team visited SIA with pilot union to show how LOSA can help line pilot to improve safety of the flight and to share the LOSA characteristics. We have had good picture how to implement LOSA. All of them whom we visited are satisfied with LOSA to improve managing errors and recommended without hesitation.

We also shared with JAL, ANA, KAL and Airbus human factors symposium on our experiences of the preparation and the implementation of LOSA.

STEP3: Identify what to look at

The LOSA committee of the Asiana Airlines

had several meetings to identify weak areas by studying and discussing the FOQA data, confidential reports, incidents reports, crew interviews and evaluation of the training and simulator checks.

STEP 4: Determine how many segment to observe

TLC calculate the number of the segments depending on the size of the operations in an airline and the size of the LOSA.

STEP 5: Schedule audit dates, select observers and schedule training

STEP6:Conduct observer training

AUDIT

STEP 7:Analyse audit finding

STEP8:Provide feedback to system and carry out improvement to system

STEP 9: Develop enhanced policies, procedures and a safer environment

SAFEROPERATION

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, researchers from aviation universities, and regulators from CASA 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. PILOTUNION

Pilot Union is part of the LOSA Steering Committee, making LOSA a joint project between Asiana and the pilot union. It is great experience making efforts to achieve safety together with the pilot union through LOSA.

Through LOSA process, Asiana Airlines formed close 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 experienced airlines as TLC advised. We selected the observers together and went to the round table in Austin Texas with the representative from 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 and UT.

III. LOSA DATA COLLECTION

1. SECTORS

Asiana Airlines implemented LOSA data collection for 230 sectors on B737, 767, 777, 747 and A321 for two months 40 sectors

each except B737. These numbers are carefully calculated from TLC research laboratory to meet statistical requirements for the number of the percentage of daily departures on each fleet.

2.OBSERVERS

There are some conditions that observers must meet. Observers must be trust worthy. Observers should be able to understand and communicate with the instructors from TLC during the observer training in English, and write the narrations of the observation report in English. Observers must be able to keep the information he/she acquired during the observation in confidential. Besides, observers should have basic the computer skills which he will use to write the report with.

There are many ways to select observers. The Asiana pilot union selected 28 applicants, then the company selected 14 observers from the union list. Both company and the pilot union were satisfied and involved on the selection of the observers and this built trust among the line pilots with the advice from TLC.

Asiana Airlines selected 14 Internal observers, 3 external observers.

3.PILOTTRUST

It is not worth to implement LOSA if there is not enough trust of the line pilot, because they will not show the natural performance in the cockpit according to TLC. Here are key characteristics of LOSA to guaranty the trust of the line pilots.

- 1) Voluntary consent: Crews have the right to refuse a LOSA observation.
- 2) Confidentiality: Data are sent directly to TLC (The LOSA Collaborative), observers made the agreement to keep the observations confidential, and the record files of the observations in the note book

can not be decoded except TLC, because these files are encrypted.

- 3) Pilot anonymity: No names, employee numbers, dates or flight numbers are recorded. Identity of LOSA observers are not revealed to the airline, because the name of the observers are not recorded.

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
- FEED BACK

2. The final reports

TLC makes presentations to CEO and the managements of the airlines regarding the final reports after the round table data cleaning process and the final analysis. The final report should be presented to managements in safety, operations, training, standards, quality assurance and related department. It is so great to show the comparisons with other airlines in each threat and error categories and comparisons with other fleets to the management for the effective safe change process.

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 existing SOPs.

V. CONCLUSIONS

Over 90% of flights in the LOSA Archive encountered threats. 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.

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). Over 25% of the flights had mismanaged error that leads to an additional error or undesired aircraft states. 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 .

Around 25% of flights had an undesired aircraft states. Mismanaging undesired aircraft states can cause accidents.

We can make safer flight when we know these errors through LOSA. 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.

LOSA helps flight crew to avoid committing errors, manage threats, manage their own errors, and manage undesired aircraft states

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