

Proactive Safety Management: Maintenance and Ramp Line Operations Safety Audit (LOSA)

Presented to: Regional Airline Association Conference

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ATA Maintenance and Ramp Human Factors
Taskforce

Date: May 24-27, 2010



Federal Aviation
Administration



Agenda

- Who is involved?
- What is LOSA?
- What has been accomplished?
- How it works?
- Where do we go next?

ATA Mx and Ramp Human Factors Task Force



SAINT LOUIS
UNIVERSITY

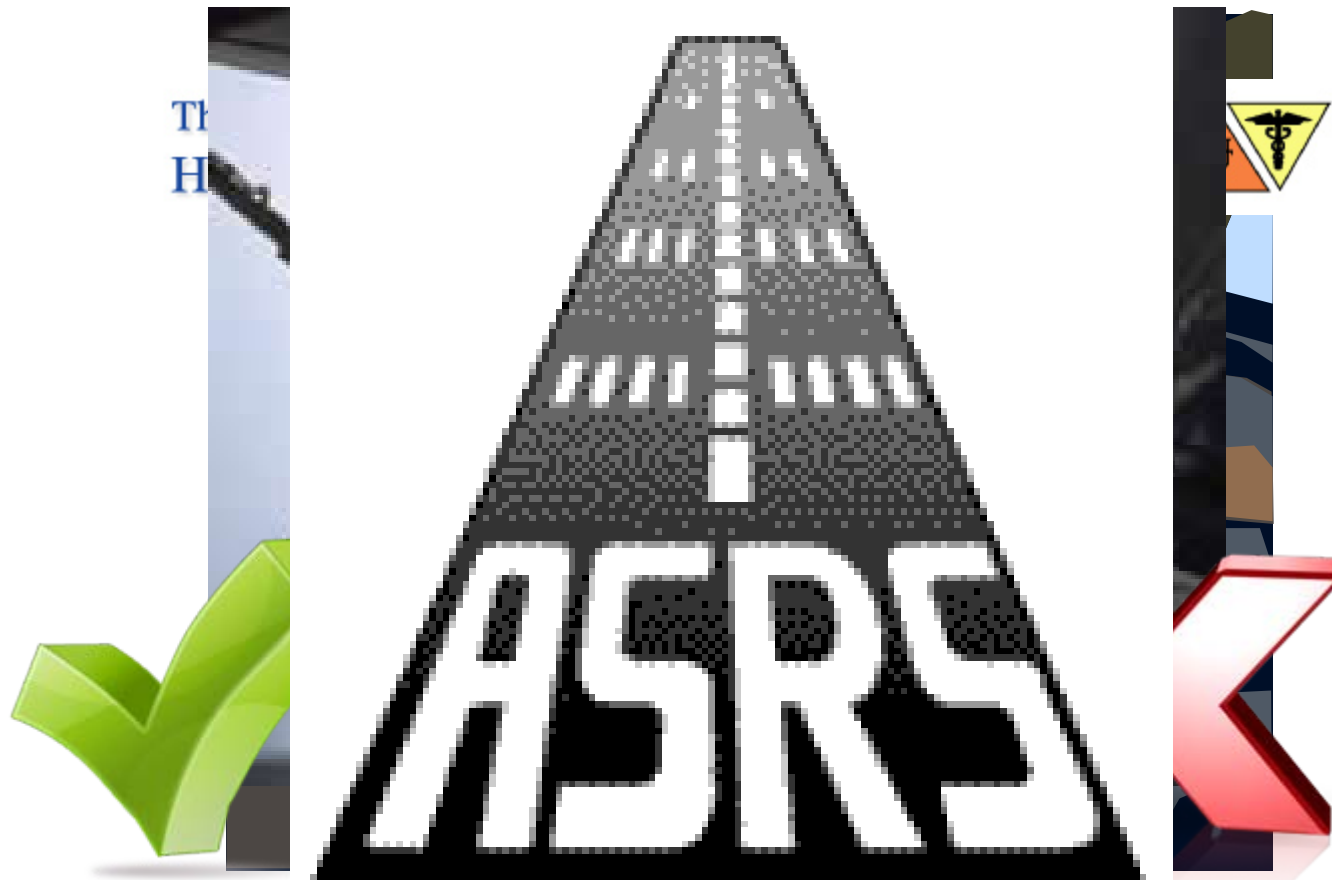




What is LOSA?

LOSA is....

- Line Operation Safety Audit





Peer-to-Peer



**Systematic
Observations**



**Confidential &
Security**



**Inform
Workforce**

**LOSA
Characteristics**



**Trusted
Observers**



**Targeted
Enhancements**



**Management &
Union**



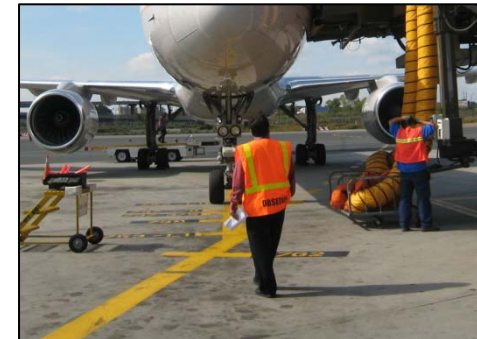
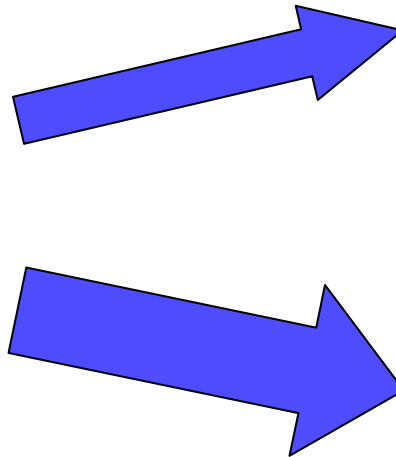
Volunteers



Accomplishments

FAA Tech Report

“A brief history of LOSA programs – from flight operations to maintenance and ramp operations”



LOSA Forms



→ Developed by reviewing and aggregating audit forms of Maintenance and Ramp LOSA (or similar programs) and related references

→ Refined during taskforce discussions & beta testing

Two overlapping screenshots of the Maintenance LOSA Observation Form. The top screenshot shows the 'Observation Form' with fields for 'Date', 'Observer', 'Location', and 'A/C Type'. The bottom screenshot shows the 'Demographics' section with fields for 'Mechanic Type', 'Type of Operation', 'Work Environment', 'Familiarity with Task', 'Experience with Task', and 'Experience with Task'. The form includes a checklist for 'Form of Experience' and 'Form of Experience'.

General Guidelines

- **The form is a guide and a place to record data for later analysis**
 - Do not need to observe everything on the forms
 - Observing and taking “samples” of behaviors on the ramp
 - Form is not in the spirit of a starting engine or pre-takeoff checklist
 - The observer as a Subject Matter Expert (SME) will probably notice threats and errors without needing the form as a cue
 - Can take notes on the ramp and then fill in the forms later

Form Sections

- 1. Arrival**
- 2. Downloading**
- 3. Lavatory/Potable Water Service**
- 4. Catering**
- 5. Cleaning Service**
- 6. Fuel Service**
- 7. Uploading**
- 8. Departure**
- 9. A/C Maintenance (Mx)**
- 10. De-Ice/Anti-Ice**
- 11. Pilot Walkaround**



Ramp LOSA Observation Form

ARRIVAL

Observation Number: _____

Did not observe this section

Scheduled Time of Arrival: _____

Estimated Time of Arrival: _____

Actual Time of Arrival: _____

	Safety Risk N/A, Safe (S), At Risk (AR), Did Not Observe (DNO)				Error Code	Threat Code	Threat Effectively Managed Y/N	Error Outcome 1.Inconsequential 2.Undesired state 3.Additional error	Remarks
	S	AR	DNO	N/A					
Pre-flight briefing (a.k.a. huddle) held	S	AR	DNO	N/A					
Ramp crew ready prior to A/C arrival	S	AR	DNO	N/A					
Arrival FOD/trash walk complete	S	AR	DNO	N/A					
Gate area cleared (clean and orderly)	S	AR	DNO	N/A					



Ramp LOSA Reference 2 -- Error Codes

Instructions for Use:

1. The following categories provide a number for the “Error Code” column in the Ramp LOSA Observation Form.
2. Select a letter and number combination (e.g., E/A-1= General Safety – Safety vests not used, improperly used, or in poor condition)
3. More than 1 code per item is possible

Definitions:

Threat – any condition that increases complexity of the operations and if not managed properly can decrease the safety margin.

Error – a mistake that is made when threats are mismanaged.

Error Codes

E/A – General Safety

E/B – Driving/Parking Errors

E/C – Events Usually Occurring During Pre-arrival and Arrival

E/D – Events Usually Occurring During Download/Upload/Servicing

E/F – Events Usually Occurring During Pushback/Departure

Ramp LOSA Observation Reference 1 – Threat Codes

Instructions for Use:

1. The following categories provide a number for the “Threat Code” column in the Ramp LOSA Observation Form.
2. Select a letter and number combination (e.g., A1= Aircraft – A/C configuration).
3. More than 1 code per item is possible

Definitions:

Threat – any condition that increases complexity of the operations and if not managed properly can decrease the safety margin.

Error – a mistake that is made when threats are mismanaged.

Threat Codes

T/A – Aircraft

T/B – Ground Equipment

T/C – Communication/Interactions

T/D – Documents

T/E – Ground Based

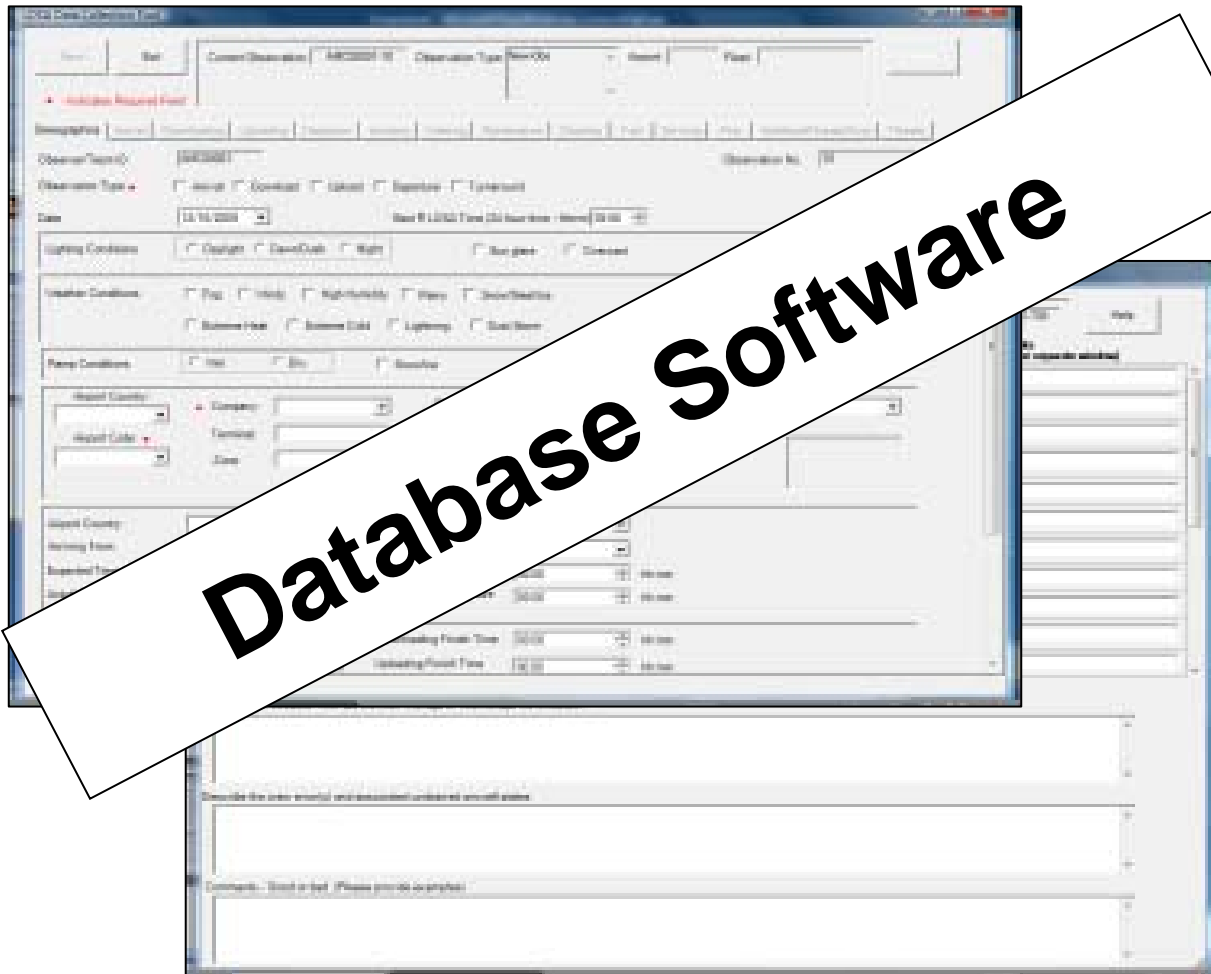
T/F – Human Factors

T/G – Operational

T/H – Leadership & Commitment

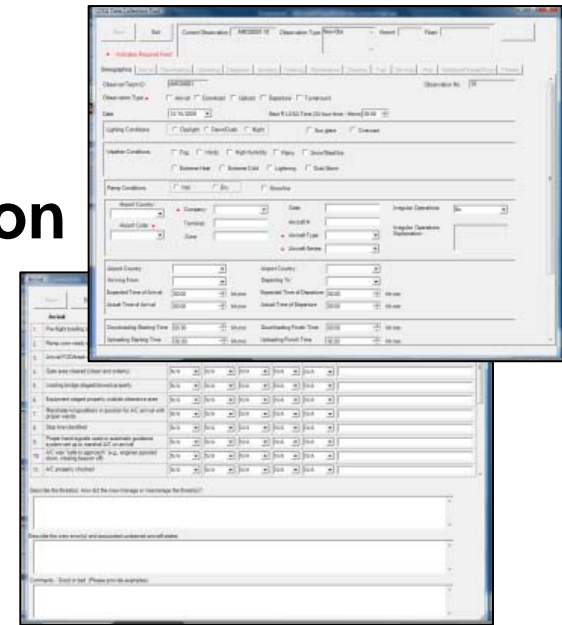
T/I – Environmental Threats





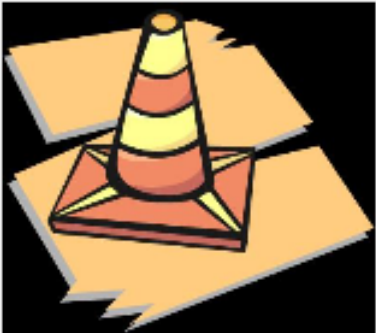
LOSA Database Software

- Basic information about the observation
- Supports all information from forms
- Analysis and report generation
- Data exportable to Excel and other statistical software
- Data will contain no identifying information on the observer or those being observed
- Forms in MSWord and PDF format



Log-in Screen

Welcome to Ramp LOSA Observation Database



Observer ID

Password

[Forgot ID or Password](#)

Log In

Exit

Admin Home

LOSA Observation Database

ObserverID: AMC00001

Print Submit New Observation New Report **Exit**

Home | My Observations | My Reports | Search | Data Management | Manage Users

To view/print any form, click on one of the links to the right.

If you don't have Acrobat Reader, click on the link at the bottom right. It's a free download.

All Ramp Forms - PDF	All Ramp Forms - Word doc
Arrival - PDF	Arrival - Word doc
Catering - PDF	Catering - Word doc
Cleaning - PDF	Cleaning - Word doc
De-Iceing - PDF	De-Iceing - Word doc
Demographics - PDF	Demographics - Word doc
Departure - PDF	Departure - Word doc
Downloading - PDF	Downloading - Word doc
Fuel - PDF	Fuel - Word doc
Lavatory - PDF	Lavatory - Word doc
Maintenance - PDF	Maintenance - Word doc
Pilot - PDF	Pilot - Word doc
Uploading - PDF	Uploading - Word doc

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LOSA Data Collection Tool

Save Exit Current Observation: AMC00001-10 Observation Type: New-Obs Airport: Fleet: Help

* - Indicates Required Field

Demographics Arrival Downloading Uploading Departure Lavatory Catering Maintenance Cleaning Fuel De-icing Pilot AdditionalThreats/Error Threats

Observer/Team ID AMC00001 Observation No. 10

Observation Type * Arrival Download Upload Departure Turnaround

Date 12/16/2009 Start R LOSA Time (24 hour-time - hhmm) 09:08

Lighting Conditions Daylight Dawn/Dusk Night Sun glare Overcast

Weather Conditions Fog Windy High Humidity Rainy Snow/Sleet/Ice
 Extreme Heat Extreme Cold Lightning Dust Storm

Ramp Conditions Wet Dry Snow/Ice

Airport Country: Company: Gate: Irregular Operations: No
 Airport Code: * Terminal: Aircraft #: Irregular Operations Explanation:
 Zone: Aircraft Type: * Aircraft Series: *

Airport Country: Arriving From Expected Time of Arrival 00:00 hh:mm
 Airport Country: Departing To Expected Time of Departure 00:00 hh:mm
 Actual Time of Arrival 00:00 hh:mm Actual Time of Departure 00:00 hh:mm

Downloading Starting Time 00:00 hh:mm Downloading Finish Time 00:00 hh:mm
 Uploading Starting Time 00:00 hh:mm Uploading Finish Time 00:00 hh:mm



Arrival

Save Exit Current Observation Observation Type Airport Fleet Help

Arrival	Safety Risk	Error Code	Threat Code	Effectively Managed	Error Outcome	Remarks (Double Click to edit in separate window)
1. Pre-flight briefing (a.k.a. huddle) held	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	
2. Ramp crew ready prior to A/C arrival	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	
3. Arrival FOD/trash walk complete	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	
4. Gate area cleared (clean and orderly)	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	
5. Loading bridge staged/stowed properly	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	
6. Equipment staged properly outside clearance area	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	
7. Marshaler/wingwalkers in position for A/C arrival with proper wands	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	
8. Stop line identified	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	
9. Proper hand signals used or automatic guidance system set up to marshal A/C on arrival	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	
10. A/C was "safe to approach" (e.g., engines spooled down, rotating beacon off)	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	
11. A/C properly chocked	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>	

Describe the threat(s). How did the crew manage or mismanage the threat(s)?

Describe the crew error(s) and associated undesired aircraft states

Comments - Good or bad (Please provide examples)

Line Operations Safety Audit (LOSA): Ramp Operations




Federal Aviation Administration



Please take a few minutes for observation

- Plane control
- Communication and no



Federal Aviation Administration

1007

Training

LOSA Training



→ Threat and Error Management (TEM)

→ LOSA Procedures

→ Scenario-based Practice

Two overlapping presentation slides from the Federal Aviation Administration. The top slide is titled "Line Operations Safety Audit (LOSA): Ramp Operations" and features the FAA logo. The bottom slide contains the text: "Please take a few minutes to code this observation", "→ Plane contacts jet bridge", and "→ Contributing factors: Lack of communication and no lighted wands". It also includes a photograph of an aircraft at a gate and the FAA logo at the bottom right.

Beta Testing

→ Forms

- Maintenance – August 2009
- Ramp – October 2009
- Cargo – March 2010

→ Software



Observation Example

Situation

- ➔ **On December 16, 2009, a B737-700 departed Tampa, FL en route to Edmonton, AB. The Captain reported smoke in the cockpit and was diverted to OKC for maintenance at 9:30 am.**
- ➔ **Captain had waited 2 minutes before the ramp crew arrived at the gate to be marshaled to the gate. There was no huddle before the aircraft arrived, wingwalkers were not in place prior to arrival, and no FOD walk was completed.**

LOSA Observation Form

ARRIVAL

Observation Number: 12-03-01

Did not observe this section

Scheduled Time of Arrival: _____ Estimated Time of Arrival: _____ Actual Time of Arrival: _____

	Safety Risk N/A, Safe (S), At Risk (AR), Did Not Observe (DNO)				Error Code	Threat Code	Threat Effectively Managed Y/N	Error Outcome 1.Inconsequential 2.Undesired state 3.Additional error	Remarks
Pre-flight briefing (a.k.a. huddle) held	S	AR	DNO	N/A					
Ramp crew ready prior to A/C arrival	S	AR	DNO	N/A					
Arrival FOD/trash walk complete	S	AR	DNO	N/A					
Gate area cleared (clean and orderly)	S	AR	DNO	N/A					



LOSA Observation Form

ARRIVAL

Observation Number: _____

Did not observe this section

Scheduled Time of Arrival: _____

Estimated Time of Arrival: _____

Actual Time of Arrival: _____

	Safety Risk N/A, Safe (S), At Risk (AR), Did Not Observe (DNO)				Error Code	Threat Code	Threat Effectively Managed Y/N	Error Outcome 1.Inconsequential 2.Undesired state 3.Additional error	Remarks
Pre-flight briefing (a.k.a. huddle) held	S	AR	DNO	N/A	E/C-1			1	
Ramp crew ready prior to A/C arrival	S	AR	DNO	N/A	E/C-5.2	T/G-2	N	3	No one there to marshal
Arrival FOD/trash walk complete	S	AR	DNO	N/A	E/C-2			1	
Gate area cleared (clean and orderly)	S	AR	DNO	N/A					



Admin Home

LOSA Observation Database

ObserverID: AMC00001

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Downloading - PDF	Downloading - Word doc
Fuel - PDF	Fuel - Word doc
Lavatory - PDF	Lavatory - Word doc
Maintenance - PDF	Maintenance - Word doc
Pilot - PDF	Pilot - Word doc
Uploading - PDF	Uploading - Word doc

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Demographics

Save Exit Current Observation Observation Type Airport Fleet Help

* - Indicates Required Field

Demographics | Arrival | Downloading | Uploading | Departure | Lavatory | Catering | Maintenance | Cleaning | Fuel | De-icing | Pilot | Additional Threats/Error | Threat Summary

Observer/Team ID * Observation Number:

Observation Type * Arrival Download Upload Departure Turnaround

Date of Observation: * Observation Start Time (24 hour-time - hhmm) * Observation End Time: *

Type of Operation Normal IRROP Domestic International

Lighting Conditions Daylight Dawn/Dusk Night Sun glare Overcast Artificial Light

Weather Conditions Clear Fog Windy High Humidity Rainy Snow/Sleet/Ice
 Extreme Heat Extreme Cold Lightning Dust Storm Others(Specify):

Ramp Conditions Wet Dry Snow/Ice Contaminated N/A

Airport Country: Company Country: Gate: Irregular Operations:

Airport Code: Company: Aircraft #: Irregular Operations Explanation:

Terminal: * Aircraft Type: * Aircraft Series:

Zone:

Airport Country: Airport Country:

Arriving From: Departing To:

Scheduled Time of Arrival: hh:mm Scheduled Time of Departure: hh:mm

Expected Time of Arrival: hh:mm Expected Time of Departure: hh:mm



Demographics

Save Exit Current Observation Observation Type Airport Fleet Help

* - Indicates Required Field

Demographics | Arrival | Downloading | Uploading | Departure | Lavatory | Catering | Maintenance | Cleaning | Fuel | De-icing | Pilot | Additional Threats/Error | Threat Summary

Observer/Team ID * Observation Number:

Observation Type * Arrival Download Upload Departure Turnaround

Date of Observation: * Observation Start Time (24 hour-time - hhmm) * Observation End Time: *

Type of Operation Normal IRROP Domestic International

Lighting Conditions Daylight Dawn/Dusk Night Sun glare Overcast Artificial Light

Weather Conditions Clear Fog Windy High Humidity Rainy Snow/Sleet/Ice
 Extreme Heat Extreme Cold Lightning Dust Storm Others(Specify):

Ramp Conditions Wet Dry Snow/Ice Contaminated N/A

Airport Country: Company Country: Gate: Irregular Operations:

Airport Code: Company: Aircraft #: Irregular Operations Explanation:

Terminal: * Aircraft Type: * Aircraft Series:

Zone:

Airport Country: Departing To: Port Country:

Arriving From: Departing To:

Scheduled Time of Arrival hh:mm Scheduled Time of Departure hh:mm

Expected Time of Arrival hh:mm Expected Time of Departure hh:mm



LOSA Data Collection Tool

Save Exit Current Observation: AMC00001-10 Observation Type: Turnaround Airport: KOKC Fleet: Boeing-B737-700 Help

* - Indicates Required Field

Demographics | Arrival | Downloading | Uploading | Departure | Lavatory | Catering | Maintenance | Cleaning | Fuel | De-icing | Pilot | AdditionalThreats/Error | Threats

Extreme Heat Extreme Cold Lightning Dust Storm

Ramp Conditions Wet Dry Snow/Ice

Airport Country: United States of Ame Company: PanAm Gate: Irregular Operations: No
 Airport Code: KOKC-Oklahoma City Terminal: Aircraft #: Irregular Operations Explanation:
 Zone: Aircraft Type: Boeing Aircraft Series: B737-700

Airport Country: United States of Ame Airport Country: Canada
 Arriving From: KTPA-Tampa/Intl, FL Departing To:
 Expected Time of Arrival: 00:00 Expected Time of Departure: CYDO-Dolbeau-St-Methode, Q
 Actual Time of Arrival: 00:00 Actual Time of Departure: CYDP-Nain, Nfld.
 CYDQ-Dawson Creek, B.C.
 CYEA-Empress, Alta.
 CYED-Edmonton/Namao Cfb, A
 CYEE-Midland/Huronia, Ont.
 CYEG-Edmonton/Intl, Alta.
 CYEK-Arviat, N.W.T.

Downloading Starting Time: 00:00 Downloading Finish Time:
 Uploading Starting Time: 00:00 Uploading Finish Time: 00:00

(Agent 1) (Agent 2)
 Ramp Crew Shift Start Time: 00:00 Length of Shift:
 Time Into Shift:
 Trainee: No

Arrival

Save Exit

Current Observation Observation Type Airport Fleet Help

Arrival	Safety Risk	Remarks (Double Click to edit in separate window)
1. Pre-flight briefing (a.k.a. huddle) held	<input type="text" value="N/A"/>	There are 0 Threat/Error combinations for this line. <input type="button" value="Edit Threats/Errors"/>
2. Ramp crew ready prior to A/C arrival	<input type="text" value="N/A"/>	There are 0 Threat/Error combinations for this line. <input type="button" value="Edit Threats/Errors"/>
3. Arrival FOD/trash walk complete	<input type="text" value="N/A"/>	There are 0 Threat/Error combinations for this line. <input type="button" value="Edit Threats/Errors"/>
4. Gate area cleared (clean and orderly)	<input type="text" value="N/A"/>	There are 0 Threat/Error combinations for this line. <input type="button" value="Edit Threats/Errors"/>
5. Loading bridge staged/stowed properly	<input type="text" value="N/A"/>	There are 0 Threat/Error combinations for this line. <input type="button" value="Edit Threats/Errors"/>
6. Equipment staged properly outside clearance area	<input type="text" value="N/A"/>	There are 0 Threat/Error combinations for this line. <input type="button" value="Edit Threats/Errors"/>
7. Marshaler/wingwalkers in position for A/C arrival with proper wands	<input type="text" value="N/A"/>	There are 0 Threat/Error combinations for this line. <input type="button" value="Edit Threats/Errors"/>
8. Stop line identified	<input type="text" value="N/A"/>	There are 0 Threat/Error combinations for this line. <input type="button" value="Edit Threats/Errors"/>
9. Proper hand signals used or automatic guidance system set up to marshal A/C on arrival	<input type="text" value="N/A"/>	There are 0 Threat/Error combinations for this line. <input type="button" value="Edit Threats/Errors"/>
10. Tow-in/tow-on procedures followed	<input type="text" value="N/A"/>	There are 0 Threat/Error combinations for this line. <input type="button" value="Edit Threats/Errors"/>
11. A/C was "safe to approach" (e.g., engines spooled)	<input type="text" value="N/A"/>	There are 0 Threat/Error combinations for this line. <input type="button" value="Edit Threats/Errors"/>

Describe the threat(s). How did the crew manage or mismanage the threat(s)?

Describe the crew error(s) and associated undesired aircraft states

Comments - Good or bad (Please provide examples)



Arrival

Save Exit

Current Observation AMC00001-MC3298 Observation Type Arrival Airport KOKC
Fleet BOEING-B737-800 Help

Arrival Safety Risk Remarks

1.	Pre-flight briefing (a
2.	Ramp crew ready p
3.	Arrival FOD/trash v
4.	Gate area cleared (
5.	Loading bridge stag
6.	Equipment staged p
7.	Marshaler/wingwalk proper wands
8.	Stop line identified
9.	Proper hand signals system set up to ma
10.	Tow-in/tow-on proc
11.	A/C was "safe to ap

Describe the threat(s). How

Describe the crew error(s)

Comments - Good or bad (Please provide examples)

Edit ThreatCodes

ThreatCodes

- TD - Documents (e.g., availability and easy access to the following documents, legibility, clarity)
- TE - Ground Based (e.g., abnormal, incorrect, inappropriate)
- TF - Human Factors
- TG - Operational
 - 1. - Coded operation days (Yellow / Red)
 - 2. - Early/unexpected or late gate changed arrival
 - 3. - Decision making/planning
 - 4. - Delays
 - 5. - Flight crew induced
 - 6. - Ground loading passengers (RJ, international)
 - 7. - Lack of resources
 - 8. - Late bags/cargo or last minute removal of bags
 - 9. - Late passengers or last minute removal of passengers
 - 10. - Nonstandard fueling operation/reconfiguration
 - 11. - Not regular work area
 - 12. - Not regular work crew
 - 13. - Operational-Unscheduled (ferry, extra section)
 - 14. - Operations-high volume
 - 15. - Operations-irregular (IROP)
 - 16. - Perceived time pressure
 - 17. - Procedure-new
 - 18. - Procedure-non standard/special
 - 19. - Schedule

Save and Exit Exit without Saving

Arrival

Save Exit

Current Observation AMC00001-MC3298 Observation Type Arrival Airport KOKC Fleet BOEING-B737-800 Help

Arrival	Safety Risk	Remarks
1. Pre-flight briefing (a		
2. Ramp crew ready p		
3. Arrival FOD/trash v		
4. Gate area cleared (
5. Loading bridge stag		
6. Equipment staged p		
7. Marshaler/wingwalk		
8. Stop line identified		
9. Proper hand signals		
10. Tow-in/tow-on proo		
11. A/C was "safe to ap		

Edit ThreatAnalysis Detail

Phase	Line Number	Description
Arrival	2	Ramp crew ready prior to A/C arrival

Safety Risk: At Risk

Rating Remarks:

Threat/Error Sequence Number: 1

Error Code: Select an Error code Clear Error Code

Threat Code: TG2. - Early/unexpected or late gate changed arrival Select a Threat code Clear Threat Code

Effectively Managed: No

Error Outcome: N/A

Threat/Error Remarks: Inconsequential, Undesired State, Additional Error

Save Exit Create New Error/Threat Comb

Describe the threat(s). How

Describe the crew error(s)

Comments - Good or bad (Please provide examples)

Arrival

Save Exit

Current Observation Observation Type Airport Help

Fleet

Arrival

Edit ThreatError

Phase	Line Number	Description
Arrival	2	Ramp crew ready prior to A/C arrival

1 of 1

Exit

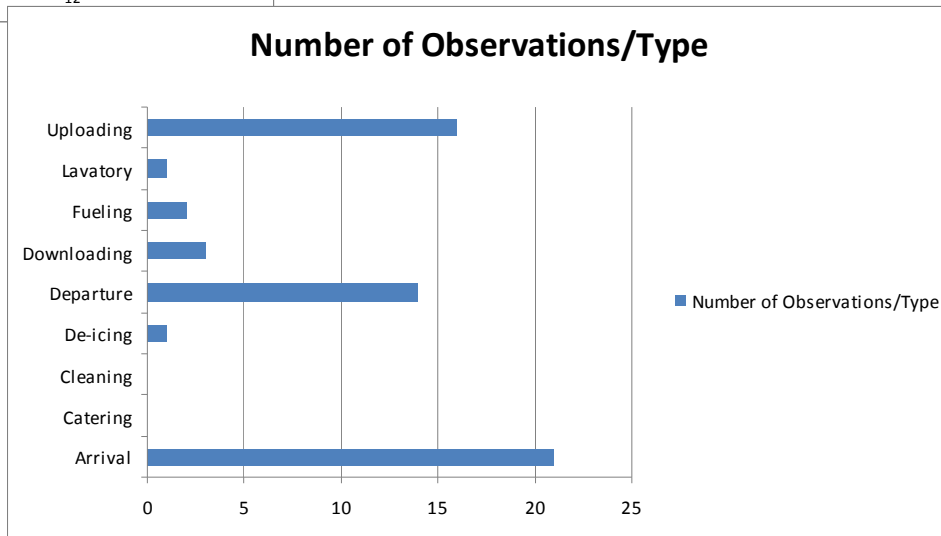
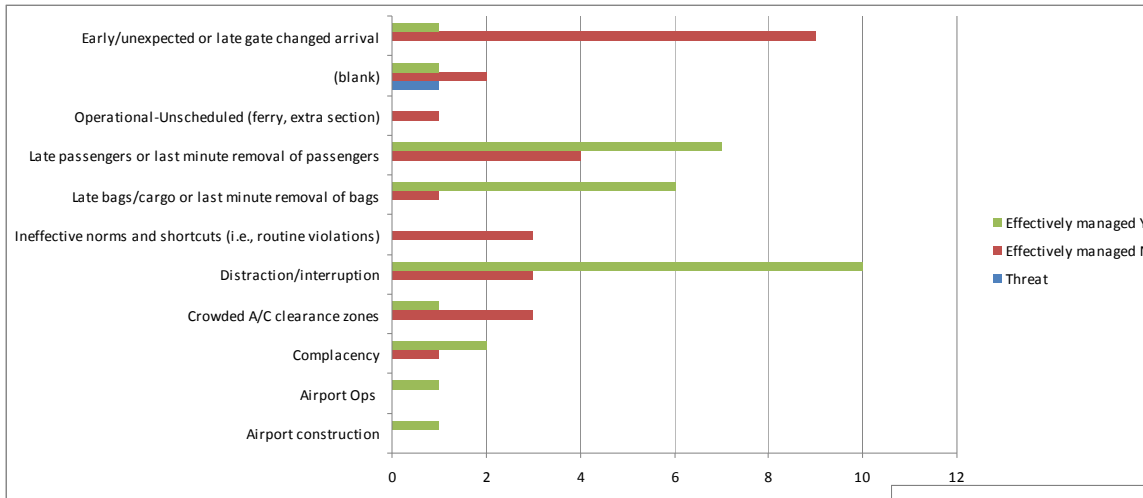
TENumb	ErrorCode	ThreatCode	Managed	ErrorOutcome	Remarks
1		TG2. -- Early/une...	No	Additional Error	
*					

Describe the threat(s)

Describe the crew error

Comments - Good or bad (Please provide examples)

Reporting Features





Next Step



Next Steps

- **Beta Tests**
 - Regional Carriers
 - International
- **Complete Training**
- **Complete Software**





Questions?

