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



### →Who is involved?

### →What is LOSA?

### What has been accomplished?

### →How it works?

### →Where do we go next?

Proactive Safety Management: Maintenance and Ramp LOSA May 25-26, 2010



# ATA Mx and Ramp Human Factors Task Force



























UNITED





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# What is LOSA?

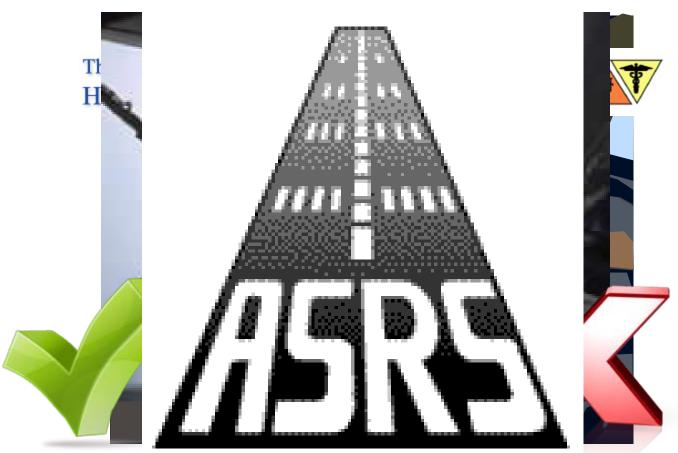
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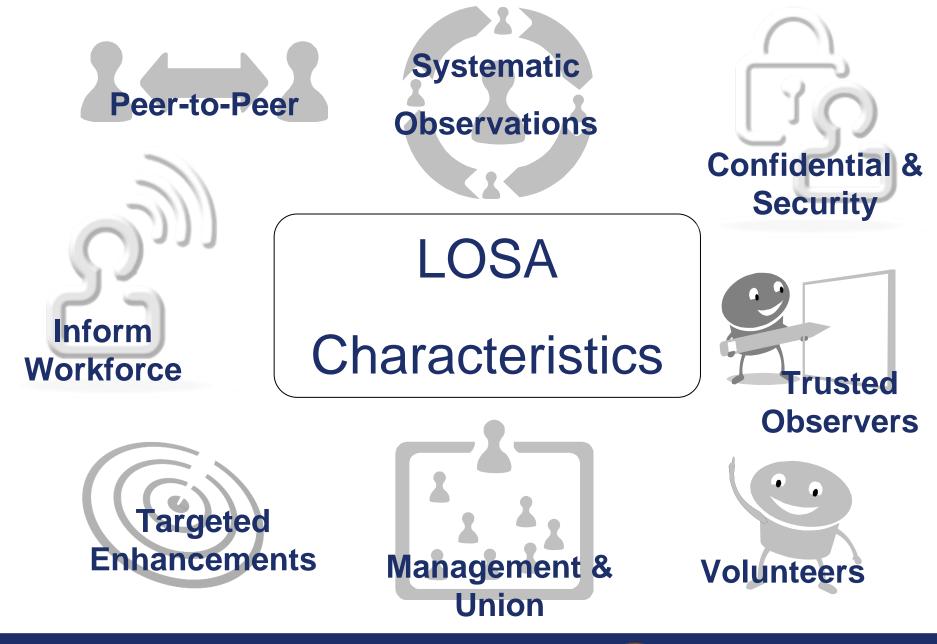
### LOSA is....

### • Line Operation Safety Audit



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# Accomplishments

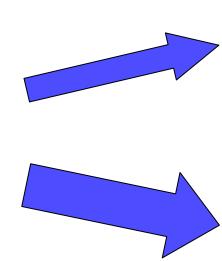
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# **FAA Tech Report**

### "A brief history of LOSA programs – from flight operations to maintenance and ramp operations"



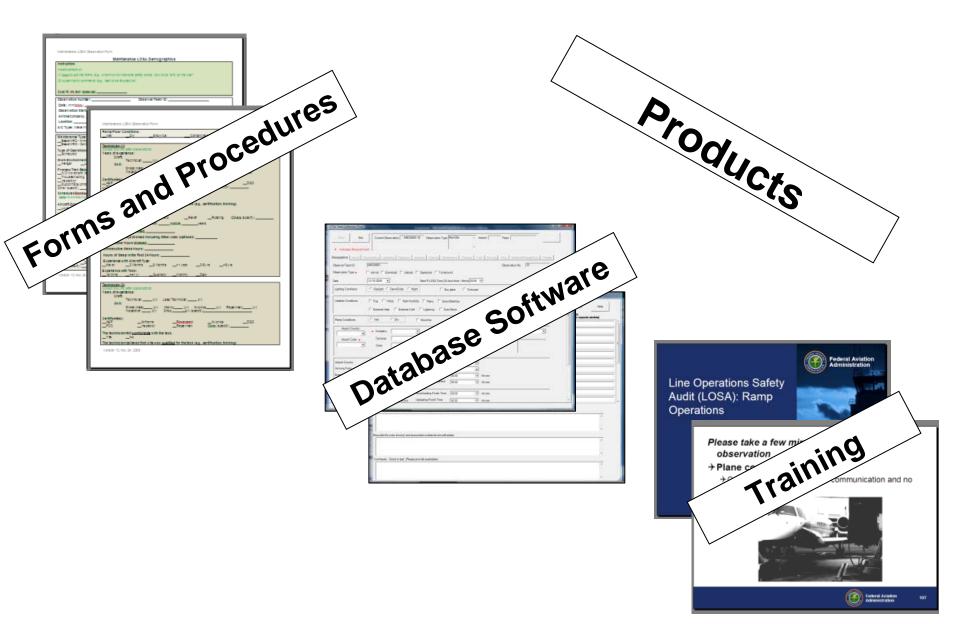




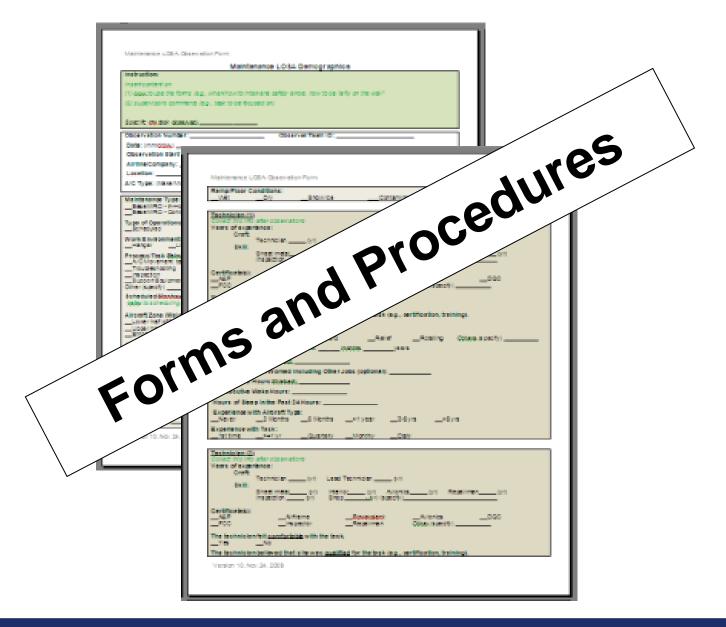


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# **LOSA Forms**



- Developed by reviewing and aggregating audit forms of Maintenance and Ramp LOSA (or similar programs) and related references
- Refined during taskforce discussions & beta testing

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# **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 observ	ve this section
Scheduled Time of Arrival:			Est	imated	Time of	Arrival: _	Actual Time of Arrival:		
	(S)	, At Ris	sk N/A, S sk (AR), erve (Df	Did	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					



#### **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 Prearrival 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



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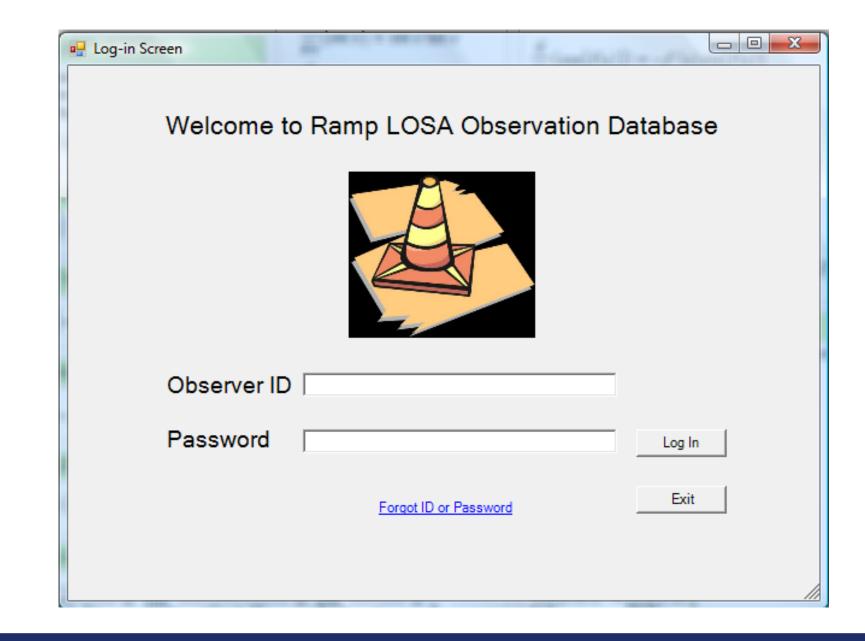
# **LOSA Database Software**

- 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



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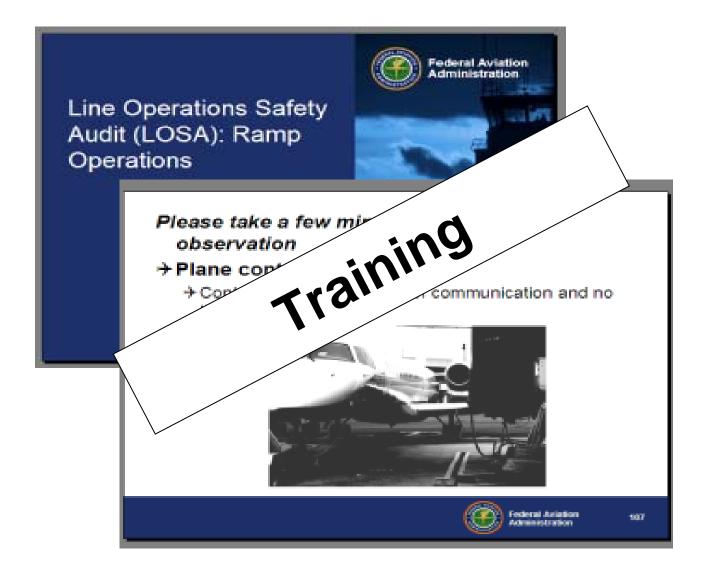


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Arriving From		•	Departing To	-			
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Actual Time of Arrival	00:00	hh:mm	Actual Time of Departure	00:00	hh:mm		
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Uploading Starting Time	00:00	🕂 hh:mm	Uploading Finish Time	00:00	hh:mm		



	Arrival	Safety Risk	Error Code		Threat Code		Effectiv Manac		Error Outcome		Remarks (Double Click to edit in separate window)
	Pre-flight briefing (a.k.a. huddle) held	N/A 💌	N/A	•	N/A	_	N/A	•	N/A	•	
	Ramp crew ready prior to A/C arrival	N/A 💌	N/A	•	N/A	-	N/A	•	N/A	•	
	Arrival FOD/trash walk complete	N/A 💌	N/A	•	N/A	-	N/A	•	N/A	•	
	Gate area cleared (clean and orderly)	N/A 💌	N/A	•	N/A	-	N/A	•	N/A	•	
	Loading bridge staged/stowed properly	N/A 💌	N/A	•	N/A	•	N/A	•	N/A	•	
	Equipment staged properly outside clearance area	N/A 💌	N/A	•	N/A	•	N/A	•	N/A	•	
	Marshaler/wingwalkers in position for A/C arrival with proper wands	N/A 💌	N/A	•	N/A	•	N/A	•	N/A	•	
	Stop line identified	N/A 💌	N/A	•	N/A	-	N/A	•	N/A	•	
	Proper hand signals used or automatic guidance system set up to marshal A/C on arrival	N/A 💌	N/A	•	N/A	-	N/A	•	N/A	•	
	A/C was "safe to approach" (e.g., engines spooled down, rotating beacon off)	N/A 💌	N/A	•	N/A	-	N/A	•	N/A	•	
	A/C properly chocked	N/A 💌	N/A	•	N/A	-	N/A	•	N/A	•	
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### >Threat and Error Management (TEM)

### → LOSA Procedures

### Scenario-based Practice





# **Beta Testing**

### → Forms

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

### → Software



### **Observation Example**

Proactive Safety Management: Maintenance and Ramp LOSA May 25-26, 2010



# 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: <u>12-03-01</u>								□Did not observ	ve this section	
Scheduled Time of Arrival:			<u>Esti</u>	mated	Time of	Arrival:	<u>A</u>	Actual Time of Arrival:		
	(S)	, At Ris	sk N/A, S sk (AR), erve (DN	Did	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**

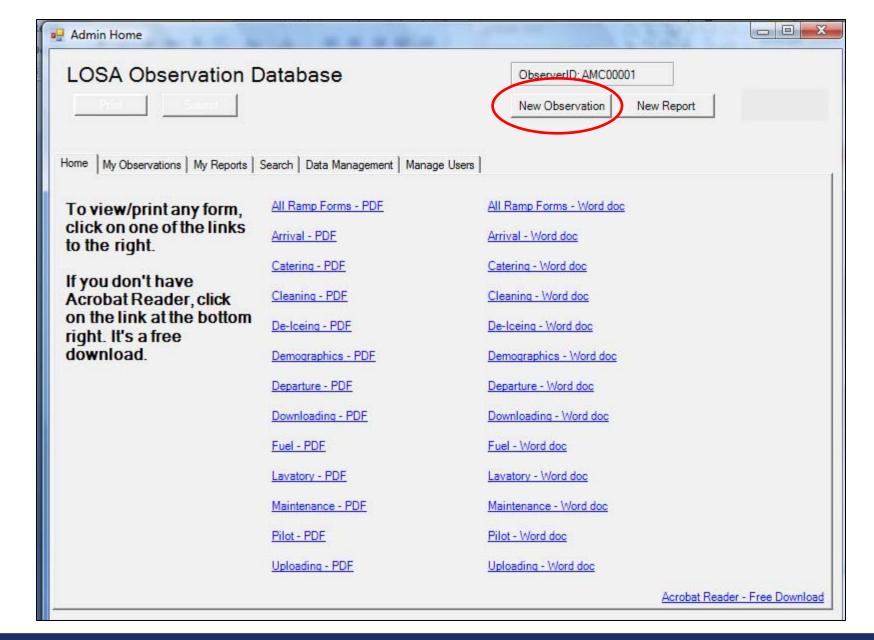
ARRIVAL

Observation Number:\_\_\_\_\_

**Did not observe this section** 

Scheduled Time of Arri	Scheduled Time of Arrival: Estimation						<u>A</u>	<u>ctual</u> Time of Arriv	al:
	S	afe (S (AR),	Risk N 6), At R Did No ve (DN	isk ot	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	DN O	N/A	E/C-1			1	
Ramp crew ready prior to A/C arrival	S	AR	DN O	N/A	€/C-5.2	T/G-2	N	3	No one there to marshal
Arrival FOD/trash walk complete	S	AR	DN O	N/A	€/C-2			1	
Gate area cleared (clean and orderly)	S	AR	DN O	N/A					







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Observer/Team ID AMC00001   Conservation Number:	•
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Date of Observation: * 3/31/2010 🔹 Observation Start Time (24 hour-time - hhmm) * 🛄 00:00 🚊 Observation End Time: * 🗐 00:00	
Type of Operation INormal IRROP Domestic International	
Lighting Conditions 🖸 Daylight O Dawn/Dusk O 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):	E
Ramp Conditions         C Wet         C Dry         Snow/Ice         C Contaminated         N/A	
Airport Country:     Company Country:     United States of Ame ▼     Gate:     Irregular Operations:	
Airport Code: Company: Aircraft #: Irregular Operations	
Terminal:     Aircraft Type:     Explanation:	
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Demographics Arrival Downloading Uploading Departure Lavatory Catering Maintenance Cleaning Fuel De-icing Pilot Threats/Error Summary	
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Observation Type 🔹 🔽 Arrival 🗌 Download 🗌 Upload 🔲 Departure 🗌 Turnaround	
Date of Observation: * 3/31/2010 🗸 Observation Start Time (24 hour-time - hhmm)* 🔽 14:00 🚊 Observation End Time: * 🕅 14:45 🚊	
Type of Operation 🔽 Normal 🔲 IRROP 🔲 Domestic 🦳 International	
Lighting Conditions 🕞 Daylight C Dawn/Dusk C Night 🗌 Sun glare 🔲 Overcast 🔲 Artificial Light	
Weather Conditions       Image: Clear in Fog in Windy in High Humidity in Rainy in Snow/Sleet/Ice         Image: Extreme Heat in Extreme Cold in Lightning in Dust Storm in Others (Specify):	III
Ramp Conditions O Wet O Dry Snow/Ice O Contaminated N/A	
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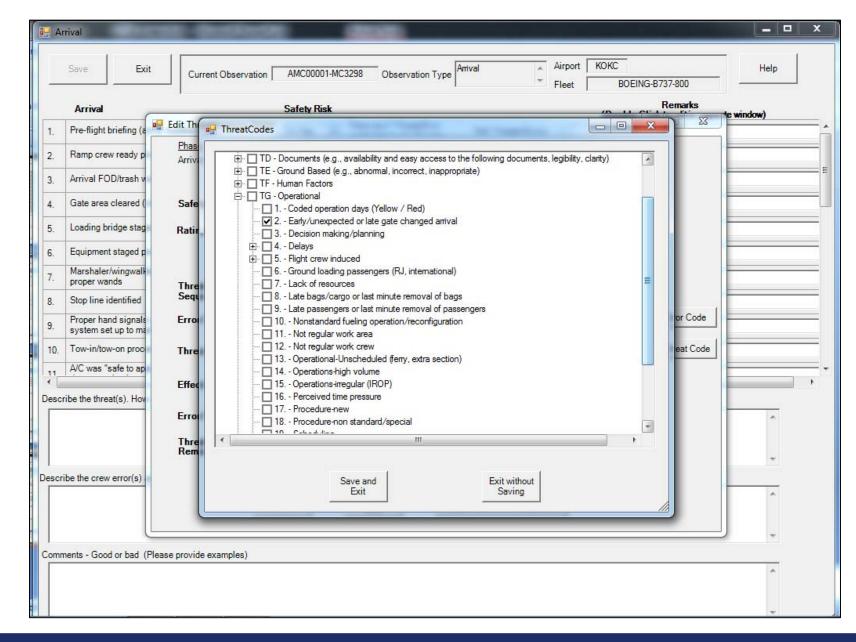


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			Aircraft Series:	B737-700	
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	(Agent 1)		(Agent 2)		
Ramp Crew Shift Start Time	00:00	hh:mm	00:00	h:mm	
Length of Shift		-			
Time Into Shift					
Trainee	No	7			



	An	ival								
		Save Exit Current Observation	AMC00001-MC3298 Observation Type Arrival Airport KOKC Fleet BOEING-B737-800	Help						
		Arrival	Safety Risk Remarks (Double Click to edit in separate	window)						
	1.	Pre-flight briefing (a.k.a. huddle) held	N/A There are 0 Threat/Error combinations for this line.	^						
	2.	Ramp crew ready prior to A/C arrival	N/A e are 0 Threat/Error Safe binations for this line. Edit Threats/Errors							
	3.	Arrival FOD/trash walk complete	At Risk re are 0 Threat/Error Edit Threats/Errors	======================================						
	4.	Gate area cleared (clean and orderly)	N/A There are 0 Threat/Error combinations for this line.							
	5.	Loading bridge staged/stowed properly	N/A There are 0 Threat/Error combinations for this line.							
	6.	Equipment staged properly outside clearance area	N/A There are 0 Threat/Error combinations for this line.							
	7.	Marshaler/wingwalkers in position for A/C arrival with proper wands	N/A There are 0 Threat/Error combinations for this line.							
	8.	Stop line identified	N/A There are 0 Threat/Error combinations for this line.							
	9.	Proper hand signals used or automatic guidance system set up to marshal A/C on arrival	N/A There are 0 Threat/Error combinations for this line.							
	10.	Tow-in/tow-on procedures followed	N/A There are 0 Threat/Error combinations for this line.							
	11 ∢	A/C was "safe to approach" (e.g., engines spooled	There are 0 Threat/Error Edit Threats/Errors							
1	Describe the threat(s). How did the crew manage or mismanage the threat(s)?									
C	escri	be the crew error(s) and associated undesired aircraft s	tates							
				~ ~						
Comments - Good or bad (Please provide examples)										
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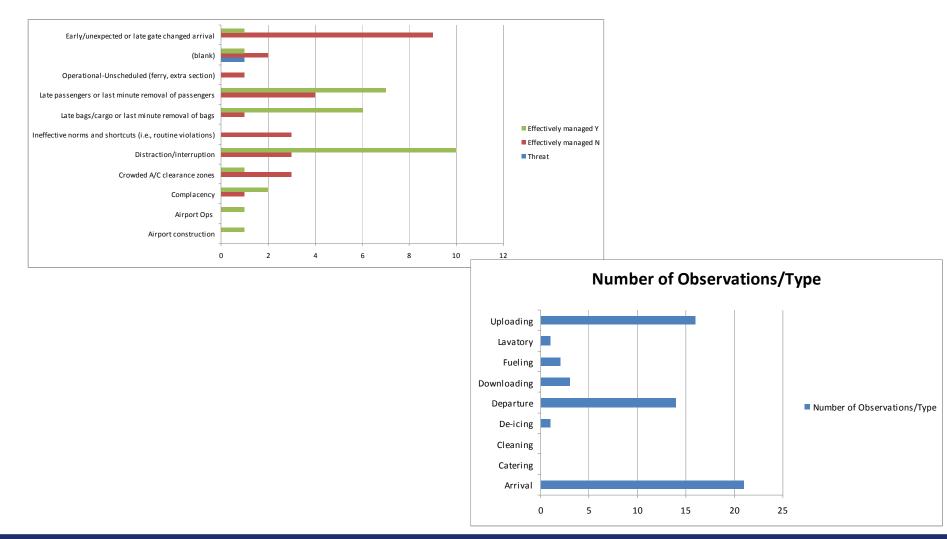
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2.	Ramp crew ready p	Phase Line Numbe Arrival 2	r <u>Description</u> Ramp crew ready prior	r to A/C arrival				
3.	Arrival FOD/trash							
4.	Gate area cleared	Safety Risk	At Risk					
5.	Loading bridge sta	Rating Remarks			~			
6.	Equipment staged				+			
7.	Marshaler/wingwal proper wands	Threat/Error	1					
8.	Stop line identified	Sequence Number					1	
9.	Proper hand signal system set up to m					Select an Error cod		
10.	and the second second second	1 2010/07/07/07/07	TG2 Early/unexpecte	ed or late gate changed arrival		Select a Threat cod	e Clear Threat Code	
11 ∢ Desc	A/C was "safe to an cribe the threat(s). Ho	Effectively Managed	No					
		Error Outcome	N/A N/A	•				^
		Threat/Error Remarks	Inconsequential Undesired State Additional Error		*			
Desci	ribe the crew error(s)				Ŧ			
		Si	ave E	Create New	Error/Th	reatComb		Î.
					_			J -
Com	ments - Good or bad	(Please provide examples)						
								*
								<b>v</b>



🔛 Ar	rival			l						_ 🗆 X
	Save	Exit	Current Ob	servation AMC	00001-MC3298 Ob	servation Type	Arrival 🔶	Airport T	KOKC BOEING-B737-800	Help
	Arrival	Ed	it ThreatError	540	u fisik					×
1. 2.	Arrival 2 Barry and prior to A/C arrival									
3. Arrival FOD/										=E
4.	Gate area cl	• I I	∢  1 of1		×				Exit	
5.	Loading brid		TENumb	ErrorCode	ThreatCode	Managed	ErrorOutcome	Remarks	_	
6.	Equipment st	<u>}</u>			TG2 Early/une	No	Additional Error		_	
7.	Marshaler/wi									
	proper wand Stop line ide	-11								
8.	Proper hand									
9.	system set u									
10.	Tow-in/tow-o	<b>P</b>								
11	A/C was "saf									-
	ribe the threat(									
Descr	ibe the crew er	18								
										*
Com	n <mark>ents - Good</mark> o	or bad (P	lease provide examp	les)						
										*
		_	16	11						*



# **Reporting Features**





# **Next Step**

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# **Next Steps**

### Beta Tests

- Regional Carriers
- International
- Complete Training
- Complete Software



# **Questions?**

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