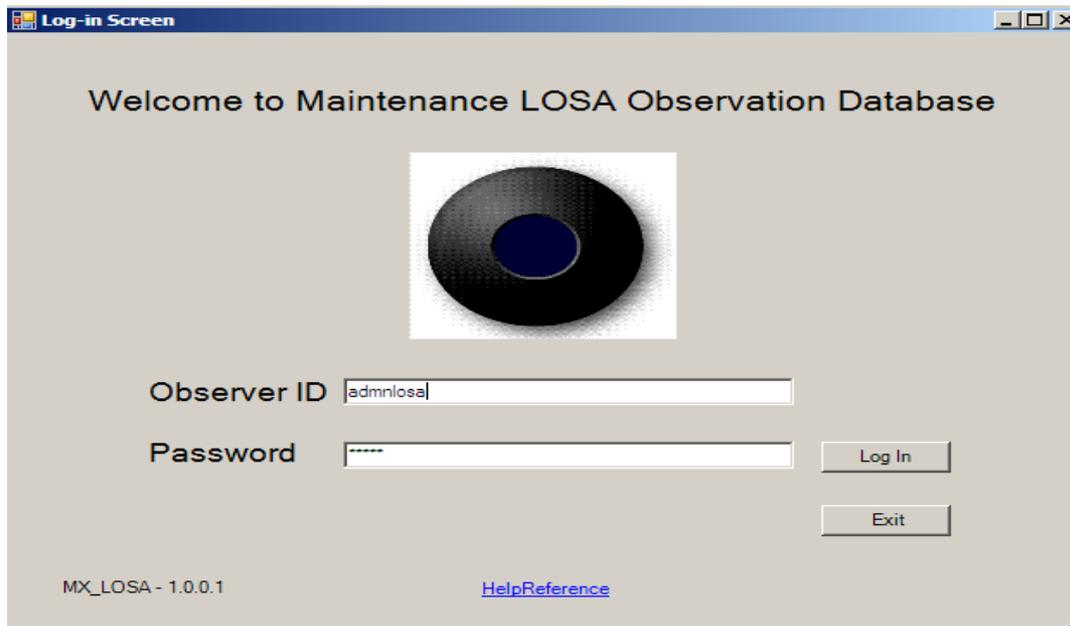


Line Operations Safety
Assessment (LOSA):
Maintenance (Mx)
Operations – Base

Training Scenarios

Observer Training Preparation

- **Prior to the start of this training**
 - Install a free copy of the Maintenance LOSA software: <http://www.MRLOSA.com>
 - Use the training Observer ID and Password to log in



Observer ID: admnlosa
Password: X1234

Observation Forms

Download and Print the Mx LOSA Observation Form from the LOSA Observation Database using the “Mx Forms” link

The screenshot shows the Federal Aviation Administration website interface. At the top left is the FAA logo and the text "Federal Aviation Administration". To the right are login fields for "Admin ID:" and "Password:" with a "Remember me" checkbox and a "forgot my password" link. Below this is a navigation bar with links: "Aircraft Maintenance Human Factors Web Portal", "MX Home", "Organization Info", "Find Info", "Applications", and "Website Help". A secondary navigation bar contains: "MX Home", "Find Info", "Mx Research Projects - Current", "M-LOSA Home", and "Forms, Software, and Training Page".

The main content area is titled "Maintenance (Mx) LOSA Database Software and Forms". On the left is a sidebar menu under "Line Operations Safety Audits" with links: Home, Introduction, Benefits of LOSA, History, Publications, Forms and Software, MX Training, Ramp Training, Management and Labor, Contact, and FAQ.

The main content area features a large blue button with a download icon and the text "Download MX LOSA". Below the button, it says "4.32 MB" and "Software Login Information". Underneath, there are two columns of links. The left column, under "Mx Manuals", includes "Mx Database Administrator Manual (pdf)" and "Mx Database User Manual (pdf)". The right column includes "Mx Forms" (highlighted with a red box), "Mx LOSA Observation Forms (pdf)", "Mx LOSA Threat Codes (pdf)", "Mx LOSA QC Observation Forms (pdf)", and "Mx LOSA QC Threat Codes (pdf)".

At the bottom of the page, there is a footer with the text "Line Operations Ramp LOSA Database Software and Forms".

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**
 - **Observe and take “samples” of behaviors in the hangar or shop or on the ramp**
 - **The 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**
- **Take notes during observation then fill in the forms later**

Observer Preparation

- **Take a few minutes before an observation to review the form**
 - **Make a general plan for your observations**
 - **Be open to changing your plan and look for the unexpected**

Observation Example

Situation

The mechanic I was observing got to work at 6:00 am that morning and started a #2 engine change procedure on a B757-200. After disconnecting the first quick disconnect line, he got paged and went to take a phone call from his wife. He came back and finished up disconnecting and capping the remaining quick disconnects, but he did not cap the first quick disconnect line. He signed the work card without noticing his error.

When answering the demographics questions, the mechanic stated that he was a midnight shift (10:00 pm to 6:00 am) mechanic. He was called in to work the day shift on his second day off. On his first day off, he went bowling with his family until 11:30 pm. He got the call to report at 6:00 am for the day shift after arriving back home around midnight.



Mx LOSA Observation Form Sections

- A. Planning
- B.1 Prepare for Removal
- B.2 Removal
- B.3 Prepare to Install
- B.4 Install
- B.5 Installation Test
- B.6 Close-up/Complete Restore
- C. Fault Isolation/Troubleshooting/Deferral
- D. Servicing

LOSA Observation Form

Threat Codes Legend

Mx/A. Information
 Mx/B. Equipment / Tools / Safety Equipment
 Mx/C. Aircraft Design / Configuration / Parts
 Mx/D. Job / Task
 Mx/E. Knowledge / Skills
 Mx/F. Individual Factors

Mx/G. Environment / Facilities
 Mx/H. Organizational Factors
 Mx/I. Leadership / Supervision
 Mx/J. Communication
 Mx/K. Quality Control
 Mx/L. Other Contributing Factors

B.2 Removal

Observation Number: _____

Did not observe this section

		Safety Risk N/A, Safe (S), At Risk (AR), Didn't Observe (DNO)	Threat Code (See Threat Codes List)	Threat Effectively Managed Y/N	Error Outcome 1.Inconsequential 2.Undesired state 3.Additional error & Remarks
Safety					
1	Notes, cautions, and warnings reviewed				
2	Notes, cautions, and warnings followed				
3	Personal protective equipment (PPE) used				
4	Collective protective equipment (e.g., yellow/black streamers, flags) used				
5	Personnel use correct manual handling, ergonomics (e.g., proper lifting techniques)				
6	Personnel exhibit appropriate work behavior (e.g., no "horseplay")				
Personnel					
7	Required personnel available				
Procedures					
8	Current documentation (e.g., task cards, AMM, service bulletins) available and reviewed				
9	Task identified				
10	Task prioritized				
11	Task delegated				
12	Removal procedures followed				
Threat Management					
13	Strategies developed for identified threats				
14	Generated non-routines for work-not-				

Threat Codes

Mx/A. Information

Mx/B. Equipment / Tools / Safety Equipment

Mx/C. Aircraft Design / Configuration / Parts

Mx/D. Job / Task

Mx/E. Knowledge / Skills

Mx/F. Individual Factors

Mx/G. Environment / Facilities

Mx/H. Organizational Factors

Mx/I. Leadership / Supervision

Mx/J. Communication

Mx/K. Quality Control

Mx/L. Other Contributing Factors

Form Section: B.2 Removal

- **Error “At Risk” item #12: REMOVAL PROCEDURES FOLLOWED**
 - Threat codes:
 - Individual Factors: Mx/F2 (Fatigue), Mx/F8 (Workplace distractions or interruptions during task performance), Mx/F15 (Other; *Technician worked on his regular day off*).
- **Error “At Risk” item #18: INDIVIDUAL WORK STEPS SIGNOFF COMPLETED**
 - Threat codes:
 - Individual Factors: Mx/F8 (Workplace distractions or interruptions during task performance)
- **Effectively managed? → No**
- **Error Outcomes → Undesired state (uncapped quick disconnect line).**

Mx/F. Individual Factors

Mx/F1. Physical health (including hearing and sight)

Mx/F2. Fatigue

Mx/F3. Time pressure

Mx/F4. Peer pressure

Mx/F5. Complacency

Mx/F6. Body size/strength

Mx/F7. Personal event (e.g., family problem, car accident)

Mx/F8. Workplace distractions or interruptions during task performance

Mx/F9. Memory lapse (forgot)

...

Mx/F15. Other (Technician worked on his regular day off)

LOSA Observation Form

B.2 Removal

Observation Number: _____

Did not observe this section

		Safety Risk N/A, Safe (S), At Risk (AR), Didn't Observe (DNO)	Threat Code (See Threat Codes List)	Threat Effectively Managed Y/N	Error Outcome 1.Inconsequential 2.Undesired state 3.Additional error & Remarks
Safety					
1	Notes, cautions, and warnings reviewed	S			
2	Notes, cautions, and warnings followed	S			
3	Personal protective equipment (PPE) used	S			
4	Collective protective equipment (e.g., yellow/black streamers, flags) used	S			
5	Personnel use correct manual handling, ergonomics (e.g., proper lifting techniques)	S			
6	Personnel exhibit appropriate work behavior (e.g., no "horseplay")	S			
Personnel					
7	Required personnel available	S			
Procedures					
8	Current documentation (e.g., task cards, AMM, service bulletins) available and reviewed	S			
9	Task identified	S			
10	Task prioritized	S			
11	Task delegated	S			
12	Removal procedures followed	AR	Mx/F2, Mx/F8, Mx/F15	N	2. Undesired State
Threat Management					
13	Strategies developed for identified threats	DNO			
14	Generated non-routines for work-not-specified in the tech publications	DNO			
Communication & Coordination					
15	Communication among technicians accomplished	DNO			
16	Communication to other departments accomplished	DNO			
Turnover or Completion					
17	Task/shift turnover completed	AR	Mx/F8	N	2. Undesired state
18	Individual work step signoff completed	S			
19	QC inspection signoff completed	S			

Additional Comments

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

When answering the demographics questions the mechanic stated that he was a midnight shift (10:00 pm to 6:00 am) mechanic. He was called in to work the day shift on his second day off. On his first day off, he went bowling with his family until 11:30 pm. He got the call to report for the day shift after arriving back home around midnight.

Describe the technician error(s) and associated undesired states

The mechanic I was observing got to work at 6:00 am that morning and started a #2 engine change procedure on a B757-200. After disconnecting the first quick disconnect line, he got paged and went to take a phone call from his wife. He came back and finished up disconnecting and capping the remaining quick disconnects, but he did not cap the first quick disconnect line. He signed the work card without noticing his error.

Comments - Good or bad (Please provide examples)

We all work fatigued but we need to be more careful.

Practice Observations

Practice Observation Instructions

- **Complete the appropriate section of the observation form for each of the following scenarios.**
- **Identify and mark down the threats and error outcomes and include any remarks.**
- **Following your observation, enter your information into the Mx LOSA software database.**

Scenario #1: Incorrect Tires

Situation

After a test flight following heavy maintenance, a 737-900 arrived late for its scheduled flight in 15 degree F (-9 C) weather. On a maintenance walk-around, the #1 tire (main landing gear) was completely deflated, which required both the #1 and #2 tires to be changed.

The technician had a limited amount of time to do the job and to get the aircraft turned around in time to meet the Estimated Time of Release. He installed the tires for a 737-900 ER on a 737-900. The two aircraft require different tires, although both tires look the same and will fit on either aircraft. The inspector found the mistake before the aircraft was returned to the line.



LOSA Observation Form

Threat Codes Legend

Mx/A. Information
 Mx/B. Equipment / Tools / Safety Equipment
 Mx/C. Aircraft Design / Configuration / Parts
 Mx/D. Job / Task
 Mx/E. Knowledge / Skills
 Mx/F. Individual Factors

Mx/G. Environment / Facilities
 Mx/H. Organizational Factors
 Mx/I. Leadership / Supervision
 Mx/J. Communication
 Mx/K. Quality Control
 Mx/L. Other Contributing Factors

B.4 Install

Observation Number: _____

Did not observe this section

		Safety Risk N/A, Safe (S), At Risk (AR), Didn't Observe (DNO)	Threat Code (See Threat Codes List)	Threat Effectively Managed Y/N	Error Outcome 1.Inconsequential 2.Undesired state 3.Additional error & Remarks
	Safety				
1	Notes, cautions, and warnings reviewed				
2	Notes, cautions, and warnings followed				
	Personnel				
3	Required personnel available				
	Procedures				
4	Current documentation (e.g., task cards, AMM, service bulletins) available and reviewed				
5	Effectivity/configuration verified				
6	Materials utilized				
7	Servicing procedures followed				
8	Installation procedures followed				
	Communication & Coordination				
9	Communication among technicians accomplished				
10	Communication to other departments accomplished				
	Threat Management				
11	Strategies developed for identified threats				
12	Generated non-routines for work-not-specified in the tech publications				
	Turnover or Completion				
13	Task/shift turnover completed				
14	Individual work step signoff completed				
15	QC inspection signoff completed				
16	Access panels installed				
	Other				
17					
18					
19					

Threat Codes

Mx/A. Information

Mx/B. Equipment / Tools / Safety Equipment

Mx/C. Aircraft Design / Configuration / Parts

Mx/D. Job / Task

Mx/E. Knowledge / Skills

Mx/F. Individual Factors

Mx/G. Environment / Facilities

Mx/H. Organizational Factors

Mx/I. Leadership / Supervision

Mx/J. Communication

Mx/K. Quality Control

Mx/L. Other Contributing Factors

Errors and Threats

- **Error “At Risk” item #5:
Effectivity/Configuration Verified.**
 - Threat codes:
 - Aircraft Design/Configuration/Parts: Mx/C3 (Aircraft configuration variability)
- **Error “At Risk” item #8: Installation procedures followed.**
 - Threat codes:
 - Aircraft Design/Configuration/Parts: Mx/C6 (Easy to install incorrectly)
 - Environment/Facilities: Mx/G3 (Environment/Facilities – Cold)
- **Effectively managed? → Yes**
- **Error Outcomes → Inconsequential**

Mx/C. Aircraft Design / Configuration / Parts

Mx/C1. Complex

Mx/C2. Inaccessible

Mx/C3. Aircraft configuration variability

Mx/C4. Parts unavailable

Mx/C5. Parts incorrectly labeled/certified

Mx/C6. Easy to install incorrectly

Mx/C7. Parts not used

Mx/C8. Other (explain below)

Mx/G. Environment / Facilities

Mx/G1. High noise level

Mx/G2. Hot

Mx/G3. Cold

Mx/G4. Humidity

Mx/G5. Rain

Mx/G6. Snow

Mx/G7. Lightning

...

LOSA Observation Form

B.4 Install

Observation Number: _____

Did not observe this section

#

		Safety Risk N/A, Safe (S), At Risk (AR), Didn't Observe (DNO)	Threat Code (See Threat Codes List)	Threat Effectively Managed Y/N	Error Outcome 1.Inconsequential 2.Undesired state 3.Additional error & Remarks
Safety					
1	Notes, cautions, and warnings reviewed	S			
2	Notes, cautions, and warnings followed	S			
Personnel					
3	Required personnel available	S			
Procedures					
4	Current documentation (e.g., task cards, AMM, service bulletins) available and reviewed				
5	Effectivity/configuration verified	AR	Mx/C3	Y	1. Inconsequential
6	Materials utilized	S			
7	Servicing procedures followed	N/A			
8	Installation procedures followed	AR	Mx/C6, Mx/G3	Y	1. Inconsequential
Communication & Coordination					

Additional Comments

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

After a post-heavy Mx test flight a 737-900 arrived late in 15 degree F (-9 C) weather. On a maintenance walk-around, the #1 tire (main landing gear) was completely deflated, which required both #1 and #2 tires to be changed. The technician had a limited amount of time to do the job and to get the aircraft turned around in time to meet the Estimated Time of Release (ETR).

Describe the technician error(s) and associated undesired states

He installed the tires for a 737-900 ER on a 737-900. The two aircraft require different tires, although both tires look the same and will fit on either aircraft.

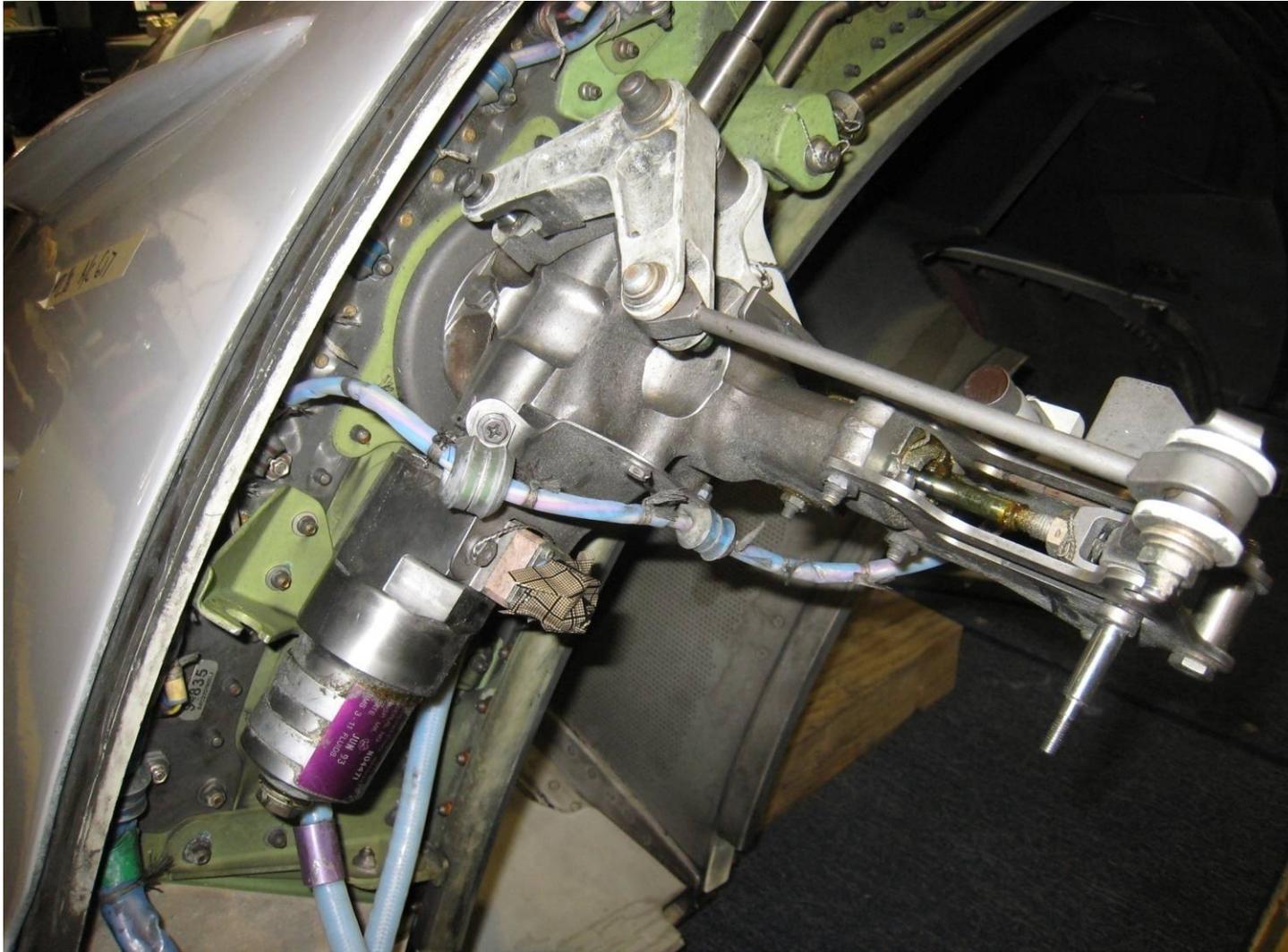
Comments - Good or bad (Please provide examples)

The inspector found the mistake before the aircraft was returned to the line. This is fine but we need to find a way to reduce the chance of this happening. The extra work and expense of fixing the mistake probably cost more than some solutions.

Scenario #2: Transducer Out of Rig

Situation

Two technicians replaced a #1 engine T/R inboard center drive unit (the CDU) on a B767-200. The LOSA observer overheard the manager say that the airplane needed to be ready in three and a half hours and there was another plane they needed to work after this one. The airplane was outside the hangar on a 100-degree F. (38 degree C.) sunny day. The LOSA observer also saw the technicians begin work without reviewing the procedure. Although they read the manual after beginning the task, the transducer was not rigged properly during the installation. The T/R subsequently failed the operational check.



LOSA Observation Form

B.4 Install

Observation Number: _____

Did not observe this section

		Safety Risk N/A, Safe (S), At Risk (AR), Didn't Observe (DNO)	Threat Code (See Threat Codes List)	Threat Effectively Managed Y/N	Error Outcome 1.Inconsequential 2.Undesired state 3.Additional error & Remarks
	Safety				
1	Notes, cautions, and warnings reviewed				
2	Notes, cautions, and warnings followed				
	Personnel				
3	Required personnel available				
	Procedures				
4	Current documentation (e.g., task cards, AMM, service bulletins) available and reviewed				
5	Effectivity/configuration verified				
6	Materials utilized				
7	Servicing procedures followed				
8	Installation procedures followed				
	Communication & Coordination				

Threat Codes

Mx/A. Information

Mx/B. Equipment / Tools / Safety Equipment

Mx/C. Aircraft Design / Configuration / Parts

Mx/D. Job / Task

Mx/E. Knowledge / Skills

Mx/F. Individual Factors

Mx/G. Environment / Facilities

Mx/H. Organizational Factors

Mx/I. Leadership / Supervision

Mx/J. Communication

Mx/K. Quality Control

Mx/L. Other Contributing Factors

Errors and Threats

- **Error “At Risk” item #8: INSTALLATION PROCEDURES FOLLOWED**
 - **Threat codes:**
 - **Knowledge/Skills: Mx/E6 (Task planning; *did not take enough time to go over the procedure*)**
 - **Individual Factors: Mx/F3 (Time pressure)**
 - **Environment/Facilities: Mx/G2 (Hot)**
- **Effectively managed? → No**
- **Error Outcomes → Undesired state (improperly rigged transducer)**

Mx/E. Knowledge / Skills

Mx/E1. Technical skills

Mx/E2. Computer skills

Mx/E3. Teamwork skills

Mx/E4. English proficiency

Mx/E5. Task knowledge

Mx/E6. Task planning

Mx/E7. Company process knowledge

Mx/E8. Aircraft system knowledge

Mx/E9. Other (explain below)

Mx/F. Individual Factors

Mx/F1. Physical health (including hearing and sight)

Mx/F2. Fatigue

Mx/F3. Time pressure

Mx/F4. Peer pressure

Mx/F5. Complacency

Mx/F6. Body size/strength

Mx/F7. Personal event (e.g., family problem, car accident)

Mx/F8. Workplace distractions or interruptions during task performance

Mx/F9. Memory lapse (forgot)

...

Mx/G. Environment / Facilities

Mx/G1. High noise level

Mx/G2. Hot

Mx/G3. Cold

Mx/G4. Humidity

Mx/G5. Rain

Mx/G6. Snow

Mx/G7. Lightning

...

LOSA Observation Form

B.4 Install

Observation Number: _____

Did not observe this section

		Safety Risk N/A, Safe (S), At Risk (AR), Didn't Observe (DNO)	Threat Code (See Threat Codes List)	Threat Effectively Managed Y/N	Error Outcome 1.Inconsequential 2.Undesired state 3.Additional error & Remarks
Safety					
1	Notes, cautions, and warnings reviewed	S			
2	Notes, cautions, and warnings followed	S			
Personnel					
3	Required personnel available	S			
Procedures					
4	Current documentation (e.g., task cards, AMM, service bulletins) available and reviewed	S			
5	Effectivity/configuration verified	S			
6	Materials utilized	S			
7	Servicing procedures followed	N/A			
8	Installation procedures followed	AR	Mx/E6, Mx/F3, Mx/G2	Y	

Additional Comments

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

Two technicians replaced a #1 engine T/R inboard center drive unit (the CDU) on a B767-200. The LOSA observer overheard the manager say that the airplane needed to be ready in three and a half hours and there was another plane they needed to work after this one. The airplane was outside the hangar on a 100-degree F. (38 degree C.) sunny day. The LOSA observer also saw the technicians begin work without reviewing the procedure. Although they read the manual after beginning the task, the transducer was not rigged properly during the installation. The T/R subsequently failed the operational check.

Describe the technician error(s) and associated undesired states

Although they read the manual the transducer was not rigged properly during the installation. The thrust reverser failed the ops check and needed to be re-rigged.

Comments - Good or bad (Please provide examples)

**Scenario #3:
B737-500 Down-Jacking**

Situation

Technicians were performing gear swing on a 737-500. After completing the operational check, one of the technicians cleared the aircraft for down jacking. As the aircraft was being lowered, the LOSA observer realized a maintenance stand had not been removed from under the tail compartment access door, and stopped the down jacking. They removed the stand and continued lowering the aircraft.



LOSA Observation Form

B.6 Close-up/Complete Restore

Observation Number: _____

Did not observe this section

		Safety Risk N/A, Safe (S), At Risk (AR), Didn't Observe (DNO)	Threat Code (See Threat Codes List)	Threat Effectively Managed Y/N	Error Outcome 1.Inconsequential 2.Undesired state 3.Additional error & Remarks
	Safety				
1	Notes, cautions, and warnings reviewed				
2	Notes, cautions, and warnings followed				
	Personnel				
3	Required personnel available				
	Tools & Equipment				
4	Support equipment (e.g., PIV/GSE, hoist, machinery) removed				
	Parts & Materials				
5	Parts, materials, and wastes dispositioned				
	Procedures				
6	Current documentation (e.g., task cards, AMM, service bulletins) available and reviewed				
7	Servicing procedures followed				
8	Required reactivation and restoration procedures followed				
9	Required reactivation and restoration documented				
10	Access panels secured				
11	Return to normal condition procedures followed				
	Threat Management				
12	Strategies developed for identified threats				
13	Generated non-routines for work-not-specified in the tech publications				
	Communication & Coordination				
14	Communication among technicians accomplished				
15	Communication to other departments accomplished				
	Turnover or Completion				

Threat Codes

Mx/A. Information

Mx/B. Equipment / Tools / Safety Equipment

Mx/C. Aircraft Design / Configuration / Parts

Mx/D. Job / Task

Mx/E. Knowledge / Skills

Mx/F. Individual Factors

Mx/G. Environment / Facilities

Mx/H. Organizational Factors

Mx/I. Leadership / Supervision

Mx/J. Communication

Mx/K. Quality Control

Mx/L. Other Contributing Factors

Form Section:

B.6 Close Up/Complete Restore

- **Error “At Risk” item #11: Return to normal condition procedures followed**
 - **Threat codes:**
 - **Individual Factors: Mx/F13 (Situational Awareness)**
 - **Communication: Mx/J4 (Maintenance crew and lead)**
- **Effectively managed? → No**
- **Error Outcomes → Undesired state (LOSA observer intervened due to imminent damage)**

Mx/F. Individual Factors

- Mx/F1. Physical health (including hearing and sight)**
- Mx/F2. Fatigue**
- Mx/F3. Time pressure**
- Mx/F4. Peer pressure**
- Mx/F5. Complacency**
- Mx/F6. Body size/strength**
- Mx/F7. Personal event (e.g., family problem, car accident)**
- Mx/F8. Workplace distractions or interruptions during task performance**
- Mx/F9. Memory lapse (forgot)**
- Mx/F10. Visual perception**
- Mx/F11. Assertiveness**
- Mx/F12. Stress**
- Mx/F13. Situational awareness**
- Mx/F14. Not properly dressed (e.g., for weather)**
- Mx/F15. Other (explain below)**

Mx/J. Communication

Mx/J1. Between departments

Mx/J2. Between mechanics

Mx/J3. Between shifts

Mx/J4. Between maintenance crew and lead

Mx/J5. Between lead and management

Mx/J6. Between flight crew and maintenance

Mx/J7. Other (explain below)

LOSA Observation Form

B.6 Close-up/Complete Restore

Observation Number: _____

Did not observe this section

		Safety Risk N/A, Safe (S), At Risk (AR), Didn't Observe (DNO)	Threat Code (See Threat Codes List)	Threat Effectively Managed Y/N	Error Outcome 1.Inconsequential 2.Undesired state 3.Additional error & Remarks
Safety					
1	Notes, cautions, and warnings reviewed	S			
2	Notes, cautions, and warnings followed	S			
Personnel					
3	Required personnel available	S			
Tools & Equipment					
4	Support equipment (e.g., PIV/GSE, hoist, machinery) removed	S			
Parts & Materials					
5	Parts, materials, and wastes disposed	S			
Procedures					
6	Current documentation (e.g., task cards, AMM, service bulletins) available and reviewed	S			
7	Servicing procedures followed	S			
8	Required reactivation and restoration procedures followed	S			
9	Required reactivation and restoration documented	S			
10	Access panels secured				
Communication & Coordination					
14	Communication among technicians accomplished	AR	Mx/F13, Mx/J4	N	2. Undesired state
15	Communication to other departments accomplished	DNO			

Additional Comments

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

Technicians were performing gear swing on a Boeing 737-500. After completing the ops check, one of the technicians cleared the aircraft for down jacking.

Describe the technician error(s) and associated undesired states

As the aircraft was being lowered, I realized a Mx stand had not been removed from under the tail compartment access door, and stopped the down jacking. They removed the Mx stand and continued the lowering the aircraft.

Comments - Good or bad (Please provide examples)

I had to intervene before they damaged the aircraft. We need to take a closer look at what went wrong.

Scenario #4: Improperly Pinned Slide

Situation

A senior mechanic with 24 years of experience was working a double shift following a “trade” day. He was installing a B737-500 aft entry door slide assembly. He did not use the maintenance manual, even though he was providing on-the-job training to two inexperienced technicians.

The R & R was done under very poor lighting conditions. The mechanic forgot to remove the safety pin from the new slide raft after installation.

The QC inspector found that the pin was not removed from the installed slide.



LOSA Observation Form

B.4 Install

Observation Number: _____

Did not observe this section

		Safety Risk N/A, Safe (S), At Risk (AR), Didn't Observe (DNO)	Threat Code (See Threat Codes List)	Threat Effectively Managed Y/N	Error Outcome 1.Inconsequential 2.Undesired state 3.Additional error & Remarks
Safety					
1	Notes, cautions, and warnings reviewed				
2	Notes, cautions, and warnings followed				
Personnel					
3	Required personnel available				
Procedures					
4	Current documentation (e.g., task cards, AMM, service bulletins) available and reviewed				
5	Effectivity/configuration verified				
6	Materials utilized				
7	Servicing procedures followed				
8	Installation procedures followed				
Communication & Coordination					

Threat Codes

Mx/A. Information

Mx/B. Equipment / Tools / Safety Equipment

Mx/C. Aircraft Design / Configuration / Parts

Mx/D. Job / Task

Mx/E. Knowledge / Skills

Mx/F. Individual Factors

Mx/G. Environment / Facilities

Mx/H. Organizational Factors

Mx/I. Leadership / Supervision

Mx/J. Communication

Mx/K. Quality Control

Mx/L. Other Contributing Factors

Errors and Threats

- **Error “At Risk” item #8: INSTALLATION PROCEDURES FOLLOWED**
 - **Threat codes:**
 - **Individual Factors: Mx/F9 (Memory lapse; *forgot*)**
 - **Environment/Facilities: Mx/G8 (Illumination)**
 - **Organizational Factors: Mx/H8 (Work process/procedure not followed)**
 - **Information: Mx/A9 (Information not used)**
- **Effectively managed? → Yes (caught by QC inspector)**
- **Error Outcomes → Inconsequential**

Mx/F. Individual Factors

Mx/F1. Physical health (including hearing and sight)

Mx/F2. Fatigue

Mx/F3. Time pressure

Mx/F4. Peer pressure

Mx/F5. Complacency

Mx/F6. Body size/strength

Mx/F7. Personal event (e.g., family problem, car accident)

Mx/F8. Workplace distractions or interruptions during task performance

Mx/F9. Memory lapse (forgot)

...

Mx/G. Environment / Facilities

Mx/G1. High noise level

Mx/G2. Hot

Mx/G3. Cold

Mx/G4. Humidity

Mx/G5. Rain

Mx/G6. Snow

Mx/G7. Lightning

Mx/G8. Illumination

...

Mx/H. Organizational Factors

Mx/H1. Quality of internal support from technical organizations

Mx/H2. Quality of external support from technical organizations

Mx/H3. Company policies

Mx/H4. Not enough staff

Mx/H5. Corporate change / restructuring

Mx/H6. Labor action

Mx/H7. Work process / procedure

Mx/H8. Work process / procedure not followed

...

Mx/A. Information

Mx/A1. Not understandable

Mx/A2. Unavailable or inaccessible

Mx/A3. Incorrect

Mx/A4. Inadequate (e.g., missing graphics)

Mx/A5. Uncontrolled (e.g., outdated)

Mx/A6. Too much conflicting information

Mx/A7. Updated process is too long or complicated

Mx/A8. Incorrectly modified manufacturer's Maintenance Manual/Service Bulletin

Mx/A9. Information not used

Mx/A10. Other (explain below)

LOSA Observation Form

B.4 Install

Observation Number: _____

Did not observe this section

		Safety Risk N/A, Safe (S), At Risk (AR), Didn't Observe (DNO)	Threat Code (See Threat Codes List)	Threat Effectively Managed Y/N	Error Outcome 1.Inconsequential 2.Undesired state 3.Additional error & Remarks
Safety					
1	Notes, cautions, and warnings reviewed	AR			
2	Notes, cautions, and warnings followed	AR			
Personnel					
3	Required personnel available	S			
Procedures					
4	Current documentation (e.g., task cards, AMM, service bulletins) available and reviewed	S			
5	Effectivity/configuration verified	DNO			
6	Materials utilized				
7	Servicing procedures followed				
8	Installation procedures followed	AR	Mx/F9, Mx/G8, Mx/H8	Y	1. Inconsequential
Communication & Coordination					

Additional Comments

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

I was observing a senior mechanic. He was performing a B737-500 aft entry door slide assembly install. He did not use the maintenance manual, even though he was providing on-the-job training to two inexperienced technicians.

The remove and replace task was done under very poor lighting conditions.

During the demographics questions he stated he has 24 years of experience. He was also working a double shift following a “trade” day.

Describe the technician error(s) and associated undesired states

The mechanic did not remove the pin from the new slide raft after installation.

The QC inspector found that the pin was not removed from the installed slide.

Comments - Good or bad (Please provide examples)

This Concludes
the Line Operations Safety
Assessment (LOSA): Maintenance
(Mx) Operations – Base
Training Scenarios

Line Operations Safety
Assessment (LOSA):
Maintenance (Mx)
Operations – Line

Training Scenarios

Observation Example

Situation

A technician was observed performing routine maintenance on an ATR-42. He was closing out the aircraft during a Remain Over Night (RON) check following a RON work card. The work card listed the systems that needed to be checked but did not include instructions to switch the main battery off. The technician left the main battery switch on. Another more experienced technician was assisting him with closing the aircraft, and found the main battery switch on. He switched it off thereby correcting the first technician's error.



LOSA Observation Form

Threat Codes Legend

Mx/A. Information
 Mx/B. Equipment / Tools / Safety Equipment
 Mx/C. Aircraft Design / Configuration / Parts
 Mx/D. Job / Task
 Mx/E. Knowledge / Skills
 Mx/F. Individual Factors

Mx/G. Environment / Facilities
 Mx/H. Organizational Factors
 Mx/I. Leadership / Supervision
 Mx/J. Communication
 Mx/K. Quality Control
 Mx/L. Other Contributing Factors

B.6 Close-up/Complete Restore

Observation Number: _____

Did not observe this section

		Safety Risk N/A, Safe (S), At Risk (AR), Didn't Observe (DNO)	Threat Code (See Threat Codes List)	Threat Effectively Managed Y/N	Error Outcome 1.Inconsequential 2.Undesired state 3.Additional error & Remarks
	Safety				
1	Notes, cautions, and warnings reviewed				
2	Notes, cautions, and warnings followed				
	Personnel				
3	Required personnel available				
	Tools & Equipment				
4	Support equipment (e.g., PIV/GSE, hoist, machinery) removed				
	Parts & Materials				
5	Parts, materials, and wastes dispositioned				
	Procedures				
6	Current documentation (e.g., task cards, AMM, service bulletins) available and reviewed				
7	Servicing procedures followed				
8	Required reactivation and restoration procedures followed				
9	Required reactivation and restoration documented				
10	Access panels secured				
11	Return to normal condition procedures followed				
	Threat Management				
12	Strategies developed for identified threats				

Threat Codes

Mx/A. Information

Mx/B. Equipment / Tools / Safety Equipment

Mx/C. Aircraft Design / Configuration / Parts

Mx/D. Job / Task

Mx/E. Knowledge / Skills

Mx/F. Individual Factors

Mx/G. Environment / Facilities

Mx/H. Organizational Factors

Mx/I. Leadership / Supervision

Mx/J. Communication

Mx/K. Quality Control

Mx/L. Other Contributing Factors

Form Section:

B.6 Close Up/Complete Restore

- Error “At Risk” item #7: **SERVICING PROCEDURES FOLLOWED**
 - Threat codes:
 - Information: Mx/A4 (Inadequate)
 - Knowledge/Skills: Mx/E5 (Task knowledge)
 - Mx/E8 (Aircraft system knowledge)
- Effectively managed? → Yes
- Error Outcomes → Inconsequential

- Mx/A.** Information (e.g. work cards, maintenance manuals, service bulletins, maintenance tips, non-routines, IPC, warning/signal, etc.)

- Mx/A1.** Not understandable
- Mx/A2.** Unavailable or inaccessible
- Mx/A3.** Incorrect
- Mx/A4.** Inadequate (e.g., missing graphics)
- Mx/A5.** Uncontrolled (e.g., outdated)
- Mx/A6.** Too much conflicting information
- Mx/A7.** Update process is too long or complicated
- Mx/A8.** Incorrectly modified manufacturer's Maintenance Manual/Service Bulletin
- Mx/A9.** Information not used
- Mx/A10.** Other (explain below)

Mx/E. Knowledge / Skills

Mx/E1. Technical skills

Mx/E2. Computer skills

Mx/E3. Teamwork skills

Mx/E4. English proficiency

Mx/E5. Task knowledge

Mx/E6. Task planning

Mx/E7. Company process knowledge

Mx/E8. Aircraft system knowledge

Mx/E9. Other (explain below)

LOSA Observation Form

Threat Codes Legend	
Mx/A. Information	Mx/G. Environment / Facilities
Mx/B. Equipment / Tools / Safety Equipment	Mx/H. Organizational Factors
Mx/C. Aircraft Design / Configuration / Parts	Mx/I. Leadership / Supervision
Mx/D. Job / Task	Mx/J. Communication
Mx/E. Knowledge / Skills	Mx/K. Quality Control
Mx/F. Individual Factors	Mx/L. Other Contributing Factors

B.6 Close-up/Complete Restore

Observation Number: _____

Did not observe this section

		Safety Risk N/A, Safe (S), At Risk (AR), Didn't Observe (DNO)	Threat Code (See Threat Codes List)	Threat Effectively Managed Y/N	Error Outcome 1.Inconsequential 2.Undesired state 3.Additional error & Remarks
Safety					
1	Notes, cautions, and warnings reviewed	S			
2	Notes, cautions, and warnings followed	S			
Personnel					
3	Required personnel available	S			
Tools & Equipment					
4	Support equipment (e.g., PIV/GSE, hoist, machinery) removed	S			
Parts & Materials					
5	Parts, materials, and wastes dispositioned	S			
Procedures					
6	Current documentation (e.g., task cards, AMM, service bulletins) available and reviewed	S			
7	Servicing procedures followed	AR	Mx/A4, Mx/E5, Mx/E8	Y	1. Inconsequential
8	Required reactivation and restoration procedures followed	S			
9	Required reactivation and restoration documented	S			

Additional Comments

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

They sent us one of the base mx guys because we were short. He did bring the RON work card for the close out. The work card listed the systems that needed to be checked but did not have instruction to secure the main battery switch. The technician left the main battery switch on. One of our senior line guys was also on the close out and found the main battery switch on.

Describe the technician error(s) and associated undesired states

Nothing came of this but we would almost had a dead aircraft in the morning.

Comments - Good or bad (Please provide examples)

When we have inexperienced mechanics we should have a second set of eyes if we have the manpower.

Practice Observations

Practice Observation Instructions

- **Please complete the appropriate section of the observation form for each of the following scenarios.**
- **Identify and mark down the threats and errors and include any remarks.**
- **Following your observation, enter your information into the Mx LOSA software database.**

**Scenario #1:
Rag Left in Equipment Bay**

Situation

A technician was in the aft equipment bay searching for fluid leaks of a CRJ-700. The LOSA observer noticed that a technician left a rag which was stuck in one of the control pulleys. A second technician found and removed the rag during the final check before closing the bay.



LOSA Observation Form

Threat Codes Legend

Mx/A. Information
 Mx/B. Equipment / Tools / Safety Equipment
 Mx/C. Aircraft Design / Configuration / Parts
 Mx/D. Job / Task
 Mx/E. Knowledge / Skills
 Mx/F. Individual Factors

Mx/G. Environment / Facilities
 Mx/H. Organizational Factors
 Mx/I. Leadership / Supervision
 Mx/J. Communication
 Mx/K. Quality Control
 Mx/L. Other Contributing Factors

B.6 Close-up/Complete Restore

Observation Number: _____

Did not observe this section

		Safety Risk N/A, Safe (S), At Risk (AR), Didn't Observe (DNO)	Threat Code (See Threat Codes List)	Threat Effectively Managed Y/N	Error Outcome 1.Inconsequential 2.Undesired state 3.Additional error & Remarks
	Safety				
1	Notes, cautions, and warnings reviewed				
2	Notes, cautions, and warnings followed				
	Personnel				
3	Required personnel available				
	Tools & Equipment				
4	Support equipment (e.g., PIV/GSE, hoist, machinery) removed				
	Parts & Materials				
5	Parts, materials, and wastes dispositioned				
	Procedures				
6	Current documentation (e.g., task cards, AMM, service bulletins) available and reviewed				
7	Servicing procedures followed				
8	Required reactivation and restoration procedures followed				
9	Required reactivation and restoration documented				
10	Access panels secured				
11	Return to normal condition procedures followed				
	Threat Management				
12	Strategies developed for identified threats				

Threat Codes

Mx/A. Information

Mx/B. Equipment / Tools / Safety Equipment

Mx/C. Aircraft Design / Configuration / Parts

Mx/D. Job / Task

Mx/E. Knowledge / Skills

Mx/F. Individual Factors

Mx/G. Environment / Facilities

Mx/H. Organizational Factors

Mx/I. Leadership / Supervision

Mx/J. Communication

Mx/K. Quality Control

Mx/L. Other Contributing Factors

Form Section:

B.6 Close Up/Complete Restore

Your sheets and software entries should contain something similar to the following...

- Error “At Risk” item #5: Parts, materials, and wastes dispositioned
 - Threat codes:
 - Individual Factors: Mx/F9 (Memory Lapse; *forgot*)
 - Environment/Facilities: Mx/G19 (Restricted/confined Work Area)
- Effectively managed? → Yes
- Error Outcomes → Inconsequential

Mx/F. Individual Factors

Mx/F1. Physical health (including hearing and sight)

Mx/F2. Fatigue

Mx/F3. Time pressure

Mx/F4. Peer pressure

Mx/F5. Complacency

Mx/F6. Body size/strength

Mx/F7. Personal event (e.g., family problem, car accident)

Mx/F8. Workplace distractions or interruptions during task performance

Mx/F9. Memory lapse (forgot)

Mx/F10. Visual perception

Mx/F11. Assertiveness

Mx/F12. Stress

Mx/F13. Situational awareness

Mx/F14. Not properly dressed (e.g., for weather)

Mx/F15. Other (explain below)

Mx/G. Environment / Facilities

...

Mx/G8. Illumination

Mx/G9. Wind

Mx/G10. Jet blast

Mx/G11. Vibrations

Mx/G12. Cleanliness

Mx/G13. Hazardous or toxic substances

Mx/G14. Contaminated surfaces

Mx/G15. Power sources

Mx/G16. Inadequate ventilation

Mx/G17. Slippery

Mx/G18. Uneven work surface

Mx/G19. Restricted/confined work area

Mx/G20. Elevated work space

...

LOSA Observation Form

Threat Codes Legend	
Mx/A. Information	Mx/G. Environment / Facilities
Mx/B. Equipment / Tools / Safety Equipment	Mx/H. Organizational Factors
Mx/C. Aircraft Design / Configuration / Parts	Mx/I. Leadership / Supervision
Mx/D. Job / Task	Mx/J. Communication
Mx/E. Knowledge / Skills	Mx/K. Quality Control
Mx/F. Individual Factors	Mx/L. Other Contributing Factors

B.6 Close-up/Complete Restore

Observation Number: _____

Did not observe this section

		Safety Risk N/A, Safe (S), At Risk (AR), Didn't Observe (DNO)	Threat Code (See Threat Codes List)	Threat Effectively Managed Y/N	Error Outcome 1. Inconsequential 2. Undesired state 3. Additional error & Remarks
Safety					
1	Notes, cautions, and warnings reviewed	DNO			
2	Notes, cautions, and warnings followed	S			
Personnel					
3	Required personnel available	S			
Tools & Equipment					
4	Support equipment (e.g., PIV/GSE, hoist, machinery) removed				
Parts & Materials					
5	Parts, materials, and wastes disposed	AR	Mx/F9, Mx/G19	Y	1. Inconsequential
Procedures					
6	Current documentation (e.g., task cards, AMM, service bulletins) available and reviewed				
7	Servicing procedures followed	S			
8	Required reactivation and restoration procedures followed				

Additional Comments

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

Two mechanics came out for the first flight of the day because of 'Fluid leak from APU.' The Captain had the aft equipment bay door open because he thought "the leak was coming from the ACM in the equipment bay, not the APU." One mechanic entered the aft equipment bay and tightened the moisture/condenser unit clamp to the forward duct. The second technician handed him some rags and went to retrieve the logbook, because the aircraft was already boarded. When the second technician came back, the first technician told him to check the equipment bay. The second technician found and removed a rag during his final check.

Describe the technician error(s) and associated undesired states

The mechanic in the equipment bay did not do a good enough check on his way out. The rag he left behind was caught in one of the control pulleys so this was not a small problem.

Comments - Good or bad (Please provide examples)

Final checks and accounting for all materials are critical. This could have been a bad situation.

Scenario #2: MEL Violation

Situation

A line technician deferred inoperative ground power lights on an B737 aircraft which was allowed by the Minimum Equipment List (MEL). However he did not carry out the maintenance procedure that was required by the MEL to verify that the avionics vent fan warning horn was operative.



LOSA Observation Form

Threat Codes Legend

Mx/A. Information
 Mx/B. Equipment / Tools / Safety Equipment
 Mx/C. Aircraft Design / Configuration / Parts
 Mx/D. Job / Task
 Mx/E. Knowledge / Skills
 Mx/F. Individual Factors

Mx/G. Environment / Facilities
 Mx/H. Organizational Factors
 Mx/I. Leadership / Supervision
 Mx/J. Communication
 Mx/K. Quality Control
 Mx/L. Other Contributing Factors

C. Fault Isolation/Troubleshooting/Deferral

Observation Number: _____

Did not observe this section

		Safety Risk N/A, Safe (S), At Risk (AR), Didn't Observe (DNO)	Threat Code (See Threat Codes List)	Threat Effectively Managed Y/N	Error Outcome 1.Inconsequential 2.Undesired state 3.Additional error & Remarks
	Safety				
1	Notes, cautions, and warnings reviewed				
2	Notes, cautions, and warnings followed				
	Communication & Coordination				
23	Supervision/logistics support responded when needed				
24	Communication among crew members accomplished				
25	Communication to other departments accomplished				

Threat Codes

Mx/A. Information

Mx/B. Equipment / Tools / Safety Equipment

Mx/C. Aircraft Design / Configuration / Parts

Mx/D. Job / Task

Mx/E. Knowledge / Skills

Mx/F. Individual Factors

Mx/G. Environment / Facilities

Mx/H. Organizational Factors

Mx/I. Leadership / Supervision

Mx/J. Communication

Mx/K. Quality Control

Mx/L. Other Contributing Factors

Errors and Threats

- **Error “At Risk” item #20: Maintenance action properly execute.**
 - **Threat codes:**
 - **Information: Mx/A9 (Information not used)**
 - **Organizational Factors: Mx/H8 (Work process/procedure not followed)**
- **Effectively managed? → No**
- **Error Outcomes → Undesired state (A/C would have been dispatched in a non-airworthy condition)**

- Mx/A.** Information (e.g. work cards, maintenance manuals, service bulletins, maintenance tips, non-routines, IPC, warning/signal, etc.)

- Mx/A1.** Not understandable
- Mx/A2.** Unavailable or inaccessible
- Mx/A3.** Incorrect
- Mx/A4.** Inadequate (e.g., missing graphics)
- Mx/A5.** Uncontrolled (e.g., outdated)
- Mx/A6.** Too much conflicting information
- Mx/A7.** Update process is too long or complicated
- Mx/A8.** Incorrectly modified manufacturer's Maintenance Manual/Service Bulletin
- Mx/A9.** Information not used
- Mx/A10.** Other (explain below)

Mx/H. Organizational Factors

- Mx/H1. Quality of internal support from technical organizations (e.g., engineering, planning, technical pubs)**
- Mx/H2. Quality of external support from technical organizations (e.g., manufacturer)**
- Mx/H3. Company policies**
- Mx/H4. Not enough staff**
- Mx/H5. Corporate change / restructuring**
- Mx/H6. Labor action**
- Mx/H7. Work process / procedure**
- Mx/H8. Work process / procedure not followed**
- Mx/H9. Work process / procedure not documented**
- Mx/H10. Work group normal practice (norm)**
- Mx/H11. Team building**
- Mx/H12. Other (explain below)**

LOSA Observation Form

Threat Codes Legend

Mx/A. Information
 Mx/B. Equipment / Tools / Safety Equipment
 Mx/C. Aircraft Design / Configuration / Parts
 Mx/D. Job / Task
 Mx/E. Knowledge / Skills
 Mx/F. Individual Factors

Mx/G. Environment / Facilities
 Mx/H. Organizational Factors
 Mx/I. Leadership / Supervision
 Mx/J. Communication
 Mx/K. Quality Control
 Mx/L. Other Contributing Factors

C. Fault Isolation/Troubleshooting/Deferral

Observation Number: _____

Did not observe this section

		Safety Risk N/A, Safe (S), At Risk (AR), Didn't Observe (DNO)	Threat Code (See Threat Codes List)	Threat Effectively Managed Y/N	Error Outcome 1. Inconsequential 2. Undesired state 3. Additional error & Remarks
	Safety				
1	Notes, cautions, and warnings reviewed	S			
2	Notes, cautions, and warnings followed	S			
20	Maintenance action properly executed	AR	Mx/A9, Mx/H8	N	2. Undesired state
21	Maintenance log updated	S			
22	Close up procedures followed				
	Communication & Coordination				
23	Supervision/logistics support responded when needed	DNO			
24	Communication among crew members accomplished	DNO			
25	Communication to other departments accomplished				

Additional Comments

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

A line technician found that three of four ground power lights were inop on test. He checked the MEL in the Operating Manual for ground power lights. He thought the power light was secondary and that the aircraft was serviceable since only the light function was out.

Describe the technician error(s) and associated undesired states

I told the line technician before he dispatched the aircraft that he needed to complete the check on the avionics vent fan horn. He was ready to dispatch this aircraft with an illegal deferral.

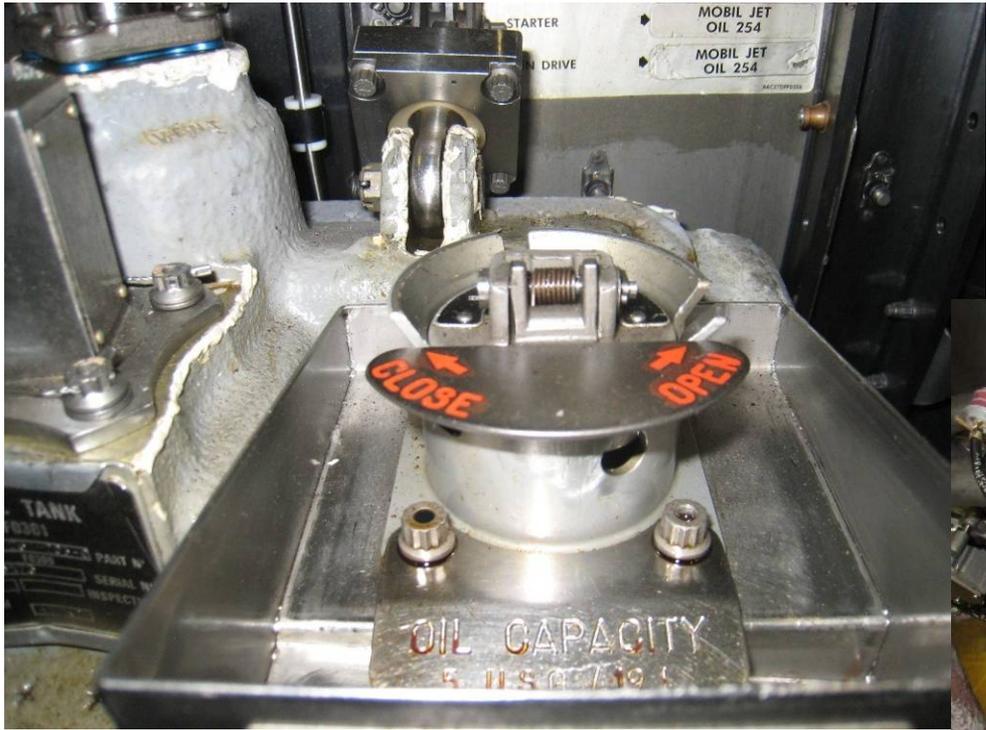
Comments - Good or bad (Please provide examples)

All of the safety nets failed on this. I had to intervene and have him do the checks before he dispatched this unairworthy aircraft.

Scenario #3: Engine Oil Filler Cap

Situation

An inexperienced line technician was servicing oil on the right engine on a B737-800 after engine shutdown. The technician was observed putting on the oil filler cap, but did not lock it down. A lead technician standing nearby saw that it was not locked and corrected the problem. The technician was unfamiliar with the cap.



LOSA Observation Form

Threat Codes Legend

Mx/A. Information
 Mx/B. Equipment / Tools / Safety Equipment
 Mx/C. Aircraft Design / Configuration / Parts
 Mx/D. Job / Task
 Mx/E. Knowledge / Skills
 Mx/F. Individual Factors

Mx/G. Environment / Facilities
 Mx/H. Organizational Factors
 Mx/I. Leadership / Supervision
 Mx/J. Communication
 Mx/K. Quality Control
 Mx/L. Other Contributing Factors

D. Servicing

Observation Number: _____

Did not observe this section

		Safety Risk N/A, Safe (S), At Risk (AR), Didn't Observe (DNO)	Threat Code (See Threat Codes List)	Threat Effectively Managed Y/N	Error Outcome 1.Inconsequential 2.Undesired state 3.Additional error & Remarks
	Safety				
1	Notes, cautions, and warnings reviewed				
2	Notes, cautions, and warnings followed				
18	Close up procedures followed				
	Communication & Coordination				
19	Supervision/logistics support responded when needed				
20	Communication among crew members accomplished				
21	Communication to other departments accomplished				

Threat Codes

Mx/A. Information

Mx/B. Equipment / Tools / Safety Equipment

Mx/C. Aircraft Design / Configuration / Parts

Mx/D. Job / Task

Mx/E. Knowledge / Skills

Mx/F. Individual Factors

Mx/G. Environment / Facilities

Mx/H. Organizational Factors

Mx/I. Leadership / Supervision

Mx/J. Communication

Mx/K. Quality Control

Mx/L. Other Contributing Factors

Form Section: D. Servicing

- **Error “At Risk” item #18: CLOSE UP PROCEDURES FOLLOWED**
 - **Threat codes:**
 - **Job/Task: Mx/E1 (Technical Skills)**
- **Effectively managed? → Yes**
- **Error Outcomes → Inconsequential**

Mx/E. Knowledge / Skills

Mx/E1. Technical skills

Mx/E2. Computer skills

Mx/E3. Teamwork skills

Mx/E4. English proficiency

Mx/E5. Task knowledge

Mx/E6. Task planning

Mx/E7. Company process knowledge

Mx/E8. Aircraft system knowledge

Mx/E9. Other (explain below)

LOSA Observation Form

Threat Codes Legend

Mx/A. Information
 Mx/B. Equipment / Tools / Safety Equipment
 Mx/C. Aircraft Design / Configuration / Parts
 Mx/D. Job / Task
 Mx/E. Knowledge / Skills
 Mx/F. Individual Factors

Mx/G. Environment / Facilities
 Mx/H. Organizational Factors
 Mx/I. Leadership / Supervision
 Mx/J. Communication
 Mx/K. Quality Control
 Mx/L. Other Contributing Factors

D. Servicing

Observation Number: _____

Did not observe this section

±

		Safety Risk N/A, Safe (S), At Risk (AR), Didn't Observe (DNO)	Threat Code (See Threat Codes List)	Threat Effectively Managed Y/N	Error Outcome 1. Inconsequential 2. Undesired state 3. Additional error & Remarks
Safety					
1	Notes, cautions, and warnings reviewed	DNO			
2	Notes, cautions, and warnings followed	S			
15	Open up procedures followed	S			
16	Proper cool down/drain down/temperature requirements observed	S			
17	Replenishment procedures followed	S			
18	Close up procedures followed	AR	Mx/E5	Y	1. Inconsequential
Communication & Coordination					
19	Supervision/logistics support responded when needed	S			
20	Communication among crew members accomplished				
21	Communication to other departments accomplished				

Additional Comments

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

I was observing an inexperienced line technician servicing oil on the right engine on a B737-800. He waited two hours after engine shutdown so there was no issue with drain down.

Describe the technician error(s) and associated undesired states

The technician didn't lock the oil filler cap down. A lead tech saw that it was not locked and showed the new tech what needed to be done.

Comments - Good or bad (Please provide examples)

This was a good example of a lead tech doing his job by working with the inexperienced technician.

**Scenario #4:
757 Blind Oil Fill**

Situation

The crew of a B757-200 that had been parked for over an hour called with the #2 engine EICAS showing only 12 quarts static at the gate. Because of time pressure, the lead technician had a line technician do a blind fill of 14 quarts of oil without running the engine first. This resulted in an overfilled oil reservoir.



LOSA Observation Form

Threat Codes Legend	
T/A. Information	T/G. Environment / Facilities
T/B. Equipment / Tools / Safety Equipment	T/H. Organizational Factors
T/C. Aircraft Design / Configuration / Parts	T/I. Leadership / Supervision
T/D. Job / Task	T/J. Communication
T/E. Knowledge / Skills	T/K. Quality Control
T/F. Individual Factors	T/L. Other Contributing Factors

6. Servicing

Observation Number: _____

Did not observe this section

		Safety Risk N/A, Safe (S), At Risk (AR), Didn't Observe (DNO)	Threat Code (See Threat Codes List)	Threat Effectively Managed Y/N	Error Outcome 1.Inconsequential 2.Undesired state 3.Additional error & Remarks
Safety					
1	Notes, cautions, and warnings reviewed				
2	Notes, cautions, and warnings followed				

15	Open up procedures followed				
16	Proper cool down/drain down/temperature requirements observed				
17	Replenishment procedures followed				
18	Close up procedures followed				
Communication & Coordination					

Threat Codes

- Mx/A. Information
- Mx/B. Equipment / Tools / Safety Equipment
- Mx/C. Aircraft Design / Configuration / Parts
- Mx/D. Job / Task
- Mx/E. Knowledge / Skills
- Mx/F. Individual Factors
- Mx/G. Environment / Facilities
- Mx/H. Organizational Factors
- Mx/I. Leadership / Supervision
- Mx/J. Communication
- Mx/K. Quality Control
- Mx/L. Other Contributing Factors

Errors and Threats

- **Error “At Risk” item #12: Documentation available and reviewed**
 - Threat codes:
 - Information: Mx/A9 (Information not used)
 - Individual Factors: Mx/F3 (Time pressure)
- **Error “At Risk” item #16: Proper cool down/drain down/temperature requirements observed**
 - Threat codes:
 - Individual Factors: Mx/F3 (Time pressure)
- **Error “At Risk” item #17: Replenishment procedures followed**
 - Threat codes:
 - Organizational Factors : Mx/H8 (Work process/procedure not followed, Mx/H10 (Work group normal practice; norm)
 - Leadership/Supervision: Mx/I6 (Other; *Lead instructed technician to act against procedure*)
- **Effectively managed? → No**
- **Error Outcomes → Undesired state (overfilled oil reservoir)**

- Mx/A.** Information (e.g. work cards, maintenance manuals, service bulletins, maintenance tips, non-routines, IPC, warning/signal, etc.)

- Mx/A1.** Not understandable
- Mx/A2.** Unavailable or inaccessible
- Mx/A3.** Incorrect
- Mx/A4.** Inadequate (e.g., missing graphics)
- Mx/A5.** Uncontrolled (e.g., outdated)
- Mx/A6.** Too much conflicting information
- Mx/A7.** Update process is too long or complicated
- Mx/A8.** Incorrectly modified manufacturer's Maintenance Manual/Service Bulletin
- Mx/A9.** Information not used
- Mx/A10.** Other (explain below)

Mx/F. Individual Factors

Mx/F1. Physical health (including hearing and sight)

Mx/F2. Fatigue

Mx/F3. Time pressure

Mx/F4. Peer pressure

Mx/F5. Complacency

Mx/F6. Body size/strength

Mx/F7. Personal event (e.g., family problem, car accident)

Mx/F8. Workplace distractions or interruptions during task performance

Mx/F9. Memory lapse (forgot)

...

Mx/H. Organizational Factors

- Mx/H1. Quality of internal support from technical organizations (e.g., engineering, planning, technical pubs)**
- Mx/H2. Quality of external support from technical organizations (e.g., manufacturer)**
- Mx/H3. Company policies**
- Mx/H4. Not enough staff**
- Mx/H5. Corporate change / restructuring**
- Mx/H6. Labor action**
- Mx/H7. Work process / procedure**
- Mx/H8. Work process / procedure not followed**
- Mx/H9. Work process / procedure not documented**
- Mx/H10. Work group normal practice (norm)**
- Mx/H11. Team building**
- Mx/H12. Other (explain below)**

Mx/I. Leadership / Supervision

Mx/I1. Planning / organization of tasks

Mx/I2. Prioritization of work

Mx/I3. Delegation / assignment of task

Mx/I4. Unrealistic attitude / expectations

Mx/I5. Availability of supervision

Mx/I6. Other (explain below)

LOSA Observation Form

Threat Codes Legend

Mx/A. Information
 Mx/B. Equipment / Tools / Safety Equipment
 Mx/C. Aircraft Design / Configuration / Parts
 Mx/D. Job / Task
 Mx/E. Knowledge / Skills
 Mx/F. Individual Factors

Mx/G. Environment / Facilities
 Mx/H. Organizational Factors
 Mx/I. Leadership / Supervision
 Mx/J. Communication
 Mx/K. Quality Control
 Mx/L. Other Contributing Factors

D. Servicing

Observation Number: _____

Did not observe this section

		Safety Risk N/A, Safe (S), At Risk (AR), Didn't Observe (DNO)	Threat Code (See Threat Codes List)	Threat Effectively Managed Y/N	Error Outcome 1. Inconsequential 2. Undesired state 3. Additional error & Remarks
Safety					
1	Notes, cautions, and warnings reviewed				
2	Notes, cautions, and warnings followed				
Procedures					
12	Documentation available and reviewed (e.g., task cards, maintenance manuals, service bulletins)	AR	Mx/A9, Mx/F3	N	2. Undesired state
13	Effectivity/configuration verified	S			
14	Hazardous energy systems (electrical, hydraulics, pneumatics, stored energy) deactivation LOTO procedures verified	S			
15	Open up procedures followed	S			
16	Proper cool down/drain down/temperature requirements observed	AR	Mx/F3	N	2. Undesired state
17	Replenishment procedures followed	AR	Mx/H8 & H10, Mx/I6	N	2. Undesired state
18	Close up procedures followed	S			
Communication & Coordination					

Additional Comments

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

A flight crew called requesting oil service for #2 engine due to EICAS reading 7 quarts static. The flight crew would not do a maintenance runs so the lead technician had a line technician do a blind oil fill. The line technician added 14 quarts. It did not generate a red alert automated log in the maintenance computer. The crew ran the engine for 10 minutes with no leaks or problems.

Describe the technician error(s) and associated undesired states

This was one of those few times when I had to intervene as a LOSA observer. They checked the level and fortunately it was within limits.

Comments - Good or bad (Please provide examples)

Another one of those times when nothing bad happened but could have. We are heading down a slippery slope with this type of norm.

This Concludes the
Line Operations Safety Assessment
(LOSA): Maintenance (Mx)
Operations – Line
Training Scenarios

Visit the LOSA website: www.MRLOSA.com