

NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

Maintenance Records Group Chairman's Factual Report

December 30, 2014

A. ACCIDENT DCA13RA081

Location: Bagram Air Field, Afghanistan
Date: April 29, 2013
Time: 1527 Local Time
Aircraft: National Airlines flight 102, a Boeing 747-428BCF, registration
N949CA

B. GROUP

Chairman: Tom Jacky
National Transportation Safety Board
Washington, D.C.

Member: Steve Santangelo
National Airlines
Orlando, Florida

Member: Edwin Aviles
Federal Aviation Administration
Orlando, Florida

C. SUMMARY

On April 30, 2013, at about 1527 Local Time, National Airlines flight 102, a Boeing 747-400BCF, registration N949CA, impacted terrain shortly after takeoff from Runway 03 at Bagram Air Field, Afghanistan. All 7 flight crew members were fatally injured and the airplane was destroyed by impact and post-crash fire. The flight was operating under the provisions of Title 14 Code of Federal Regulations (CFR) Part 121 Supplemental on a regularly scheduled cargo flight from Camp Bastian, through Bagram, to Dubai, United Arab Emirates. Visual meteorological conditions prevailed at the time.

The group met at the National Airlines facility in Orlando, Florida from December 18-19, 2013 to document the maintenance records related to the accident airplane. The group also documented the National Airlines maintenance program for the accident airplane.

The logbook page for the accident flight was destroyed in the accident and therefore not available; however, no anomalies were noted in the documentation available in the days

immediately prior to the accident. In addition, no major or significant maintenance had been accomplished in the 30 days prior to the accident.

D. DETAILS OF INVESTIGATION

Given the circumstances of the accident, the group focused on Joint Aircraft System/Component (JASC) or ATA Chapters 25 (Equipment/Furnishings, including Cargo Handling Systems), 27 (Flight Controls), 29 (Hydraulic Power), 31 (Instruments), 53 (Fuselage), and 55 (Stabilizers).

1. Air Carrier Certificate

National Airlines provided a copy of their Air Carrier Certificate for review.

National Airlines is located at the Citadel II Building, 5955 T.G. Lee Boulevard, Orlando, Florida, 32822. A Part 121 operations certificate, number U2RA944L, was issued to National Air Cargo Group, Inc. by the Federal Aviation Administration's (FAA) Flight Standards Division, Southern Region. The certificate was issued on August 8, 2007.

The certificate certifies that the National Air Cargo Group, Inc. is authorized to perform commercial air operations in accordance with Part 121 of the 14 Code of Federal Regulations.

At the time of the accident, the following aircraft were listed under National Airlines' Operations Specifications, Section D085:

- i. B-747-400SF, Registration N919CA, Serial Number 25302
- ii. B-747-400SF, Registration N949CA, Serial Number 25630
- iii. B-747-400SF, Registration N952CA, Serial Number 25238
- iv. B-757-28A, Registration N176CA, Serial Number 24543

2. Aircraft and Engine Information

The airplane was manufactured by Boeing on February 10, 1993, as serial number 25630 and delivered to Air France as a 747-400. In October, 2009 the airplane was converted to a 747-428BCF by Taikoo (Xiamen) Aircraft Engineering Company, Limited, Xiamen, China. National Airlines acquired the airplane from Atlanta Icelandic on August 4, 2011 and operated the airplane until the accident. At the time of the accident the airplane had accumulated 76,939.9 total hours and 10,813 total cycles.

The airplane's 4 engines were General Electric GE Snecma Model Turbofan Engine, Part Number CF6-80C2B1F. According to national Airlines records, the following engines were fitted to the airplane at the time of the accident:

- a) Engine Number 1 Serial Number: 703151
- b) Engine Number 2 Serial Number: 702644
- c) Engine Number 3 Serial Number: 702432

d) Engine Number 4 Serial Number: 702571

3. Method of Record Keeping

National Airlines retains pertinent aircraft, engine, and component records using both manual and electronic methods. Paper records were made available for this group activity, including airplane logbooks, maintenance checks, and component removal records.

National Airlines uses computer software called WinAir (an AVBASE Inventory and Maintenance Management System) to track and document airplane maintenance (See Figure 1). The software provides record storage, indexing, and retrieval of aircraft maintenance documents and records. Items written in the National Airlines Maintenance/Flight Log (known as the airplane logbook), including airplane discrepancies, are entered into WinAir.

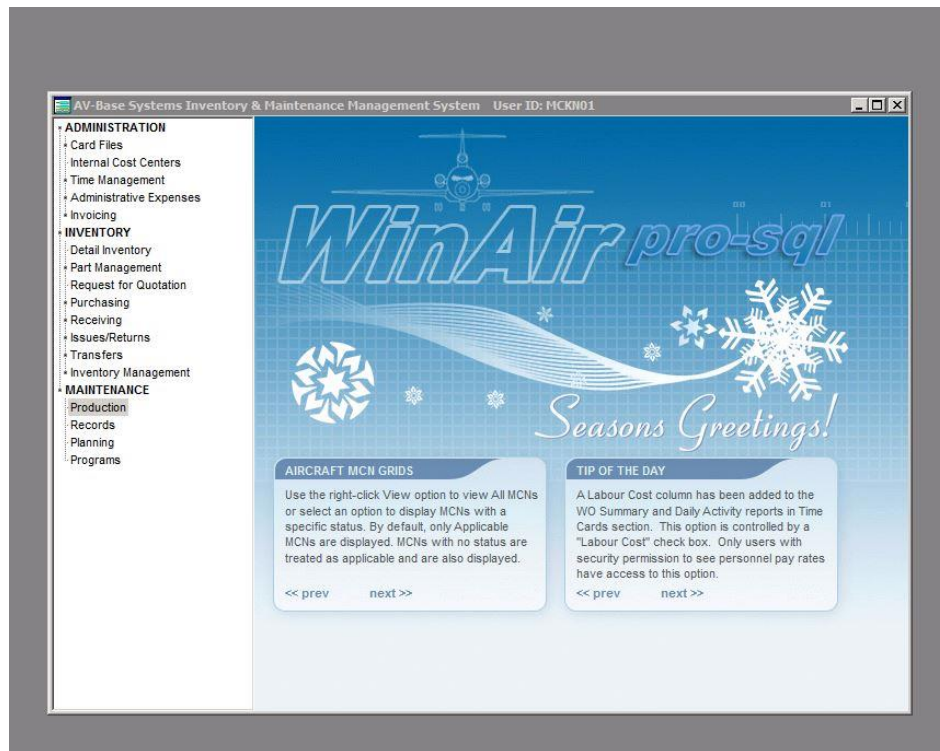


Figure 1 - Computer screen shot of WinAir.

Typically, at the end of a flight crew's trip/day, a copy of the current maintenance logbook page (white copy) is removed from the logbook and sent to the National Airlines facility in Orlando, Florida. Following scheduled maintenance, unscheduled maintenance, crew change, or flight number change, an electronic copy of the white page is sent to the Orlando facility. The pink page/copy remains in the logbook and the logbook sent to Orlando. National Airlines personnel in Orlando enter information from the electronic copy of the white page into WinAir. When the original white page is received at Orlando, the white page information is checked against the original information entered from the electronic copy.

Within WinAir, all tracked airplane parts and upcoming maintenance checks are tracked and can be listed. WinAir provides the maintenance personnel with dates and times for upcoming maintenance activities, time until replacement of components, and part and serial numbers for currently-installed components.

4. Maintenance and Inspection Program

The maintenance program is defined and described by the National Airlines Operations Specifications D072, Dated 7/13/2012. The airplane was maintained by National Airlines by a Continuous Airworthiness Maintenance Program (CAMP) Authorization, Boeing MSG-3, Volume 1, Chapter 2, for 747-400-SF aircraft.

The National Airlines B747 MSG-3 Inspection Manual, Revision 2, Accepted 7/30/2012. The document details the time limitations for check intervals and individual task intervals. The last C and D checks were accomplished by National Airlines authorized Essential Contract Maintenance Provider Taikoo (Xiamen China) Aircraft Engineering Company.

National Airlines has one maintenance base: Dubai World Central - Al Maktoum International Airport (ICAO Code: OMDW). The station is equipped to provide “A” level checks and below. The other Essential Contract Maintenance Provider bases where N949CA underwent maintenance during the time of operation by National Airlines are:

- a. KRME, Rome, New York. Premier Aviation Overhauls Center CRS; Level of Maintenance capabilities “D” check and below.
- b. ZSAM, Xaiman China. Taikoo; Level of maintenance capabilities, Major modifications, “D” Check and below.

At the time of the accident, no major or significant maintenance had been accomplished in the previous 30 days. The following is the history of most recent maintenance actions for N949CA:

Check Type	Date of Inspection	Location	Total Time	Total Cycles
Daily	4/29/2013	OAZI	76,938.3	10,812
1A	1/10/2013	OMDW	76,472.7	10,699
1D	8/5/2012	ZSAM	75,513.5	10,454
1A	4/15/2012	OMDW	75,100.0	10,315

Figure 2 - Table of Maintenance During Previous 30 Days

5. Review of Aircraft Maintenance Logbook History for N949CA

A review of the Aircraft Maintenance Log pages for N949CA for the calendar year 2012 and 2013 (until the day of the accident) was accomplished. The logbook page for the accident

flight was not available, since it would not have been removed from the logbook and sent to Orlando until after the accident flight; the logbook sheet was assumed to have been destroyed by the accident.

At the time of the accident, National Airlines had scanned, electronic copies of the National Airlines Maintenance/Flight Log pages through March 23, 2013 and electronic photographs of the National Airlines Maintenance/Flight Log pages from March 24, 2013 through April 29, 2013, the flight prior to the accident flight.

The group reviewed all of the National Airlines Maintenance/Flight Log pages for 2012 and 2013, up until the flight prior to the accident. The group did not note any logbook notations that warranted further examination or investigation.

6. Minimum Equipment List (MEL)

National Airlines has an approved MEL program. The National Airlines Minimum Equipment List B-747, Revision 3, was issued on September 14, 2012. At the time of the accident there were no items listed on the MEL.

7. N949CA Delay Reports for 6 Months Prior to Accident

National Airlines provided the maintenance delay reports for N949CA for October, 2012 to April 2013. In addition, National Airlines Operations Control Center reviewed its flight planning software for any maintenance related diversion from October through April; however, it was determined that the National Airlines Operations Control Center does not retain cancellation, diversion and deviation reports.

A review of the maintenance delay reports for N949CA provided the following four items:

- 02/19/2013 – Flap drive EICAS message, flap drive C failed.
- 03/14/2013 – Found RT fore flap trailing edge damaged.
- 03/24/2013 – Number 1 engine fan vibration 5 indication with no airplane vibration felt.
- 03/25/2013 – Number 1 engine fan vibration 5 indication. Troubleshoot and found to be faulty indication.

Each of these 4 items was resolved through the National Airlines maintenance program.

8. Airworthiness Directive Status of the Airplane

National Airlines provided electronic documentation of the FAA Airworthiness Directive compliance status for the airframe, auxiliary power unit, and all 4 engines. The airframe documentation was dated April 1, 2013. The documentation included National Airlines 747-400 Series Airworthiness Directives Status Listing for N949CA, National Airlines AD Listing for APU serial number PCE900042, National Airlines CF6-80C2B1F Engine Airworthiness Directives for each of the 4 installed engines, National Airlines AD Compliance Status for N949CA, and a letter to Air France from Boeing Commercial Airplane Group, dated February 3, 1993, providing status for all applicable Airworthiness Directives at the time of initial delivery.

The group examined the provided documentation and did not note any delinquent and open Airworthiness Directives.

9. STC / Modifications List for the Airplane

The group reviewed the list of STC/Modifications of the accident airplane provide by National Airlines. Of the 12 listed modifications, the following STCs were of interest to the group:

- i. Installation of the Telair Cargo Handling system in the Main Deck Cargo Compartment of the 747-400BCF, Install Date: 01 December 2007.

The Telair International, Inc. (Simi Valley, California) Main Deck Cargo Handling System was installed via FAA Supplemental Type Certificate Number ST00459LA.

- ii. Conversion of Combi Cargo to Full Freighter (BCF Conversion), Install Date: 01 December 2007.

10. Maintenance of Telair Main Deck Cargo Handling System

As indicated in **Section D.5. Review of Aircraft Maintenance Logbook History for N949CA**, the National Airlines Maintenance/Flight Log pages for 2012 and 2013, up until the flight prior to the accident were reviewed for information specifically regarding the Telair Cargo Handling System and the Main Deck Cargo Compartment maintenance program. The review determined the following maintenance actions during calendar year 2013, prior to the accident, for the cargo system and associated main cargo deck:

1. April 28, 2013: From Log Page # 8372, Daily Check performed at LFLX: Removed and replaced 21 Ball Transfer Unit (BTU) rollers in accordance with Telair Manual 9.5. The replaced rollers were aft of Fuselage Station (FS) 1300.

2. April 27, 2013: From Log Page # 8369: Main cargo door aft side latch will not engage properly. Inner and outer bearings were replaced per AMM 52-72.
3. April 18, 2013: From Log Page # 11509: Missing main cargo door forward upper bumper curve replaced in accordance with 747 AMM 20-51-01. From daily check performed at station KFAT.
4. February 15, 2013: From Log Page # 11011, Daily Check: Removed and replaced 2 ball transfer units at side door cargo transfer area per Telair 25-57-18. Also, removed and replaced spring-loaded roller power drive units (PDU's) at stations 290L, 700L, 750L, 1050L, 1100L, 1550L, 1600L, 1620L, 1650L per 25-57-01 AMM.
5. February 8, 2013: From Log Page # 11001: Removed and replaced spring-loaded rollers at stations 902R, 1300R, 1400R, 1500R, 1600R, 1300L, 1400L, and 1500L, per Telair 25-57-01 for main deck cargo handling system.
6. February 5, 2013: From Log Page # 11051 and 11052: Removed and replaced PDU at position 1961 in accordance with Telair AMM 25-57-01. Operation checks good. The repair was initially deferred per MEL 1171, CAT D.
7. February 4, 2013: From Log Page # 11046, noted as Daily Check: Center guide cargo restraint at position 1480 replaced. Also, DMI 1123, center guide cargo restraint at position 1690 was broken, replaced per Telair CMM 25-58-94.
8. January 18, 2013: From Log Page # 10704: Removed and replaced main drive between station 7L/700 and 8L/800 which were inoperative. Replaced per Telair 25-58-29.
9. January, 2013: From Log Page # 10703: As part of the 1A Check conducted in January, 2013 the main deck cargo compartment liner and insulation were externally examined. Also, Main Deck Cargo Loading Inspection/Cleaning was accomplished on 1/7/13. Finally, accomplished inspection of the Cargo ULD's and Restraining Devices (excluding Telair System) per Fleet Campaign Directive (FCD) ALL-25-0001, listed in National Airlines General Maintenance Manual (GMM).

In addition, the Seat Track in Wet Areas Inspection was performed on July 8, 2012 at station ZSAM per Boeing Work Card 53-720-00-01. The inspection for was conducted for corrosion, debris, or blockage that might hinder drainage, specifically in the throat and crown areas of seat tracks.

Finally, the Seat Tracks in Dry Areas Inspection was performed/completed on August 3, 2012 at station ZSAM. The work was conducted per Boeing work card 53-720-02-01. The inspection was conducted for corrosion, debris, or blockage that might hinder drainage, specifically in the throat and crown areas of the seat tracks.

11. Event of Overweight Pallet on February 12, 2012

During the on-scene phase of the investigation, National Airlines indicated that, on February 12, 2012, the accident airplane sustained an overweight landing due to overweight pallets placed in the aft section of the main cargo deck. Documentation indicated that the airplane's ZFW (zero fuel weight) was exceeded by 1,358 kg (kilograms) at pallet positions 1, 1A, 22, and 33. Based on a recommendation from Boeing, National Airlines conducted overweight landing inspections at the overweight positions. The inspections were completed in accordance with AMM 05-51-39, phase 1 option A. No defects were noted during the inspections.

In response to a query by the group, National Airlines provided the following documentation, attached to this report as attachments, of the resultant examination and repairs completed on the airplane:

- Attachment 1 - Maintenance Inspection Summary from WinAir Software;
- Attachment 2 - Log page documenting the maintenance inspection;
- Attachment 3 - Inspection Recommendation Letter from Boeing;

Based on the documentation provided by National Airlines, the group determined that no further investigation of the overweight pallet event was necessary.

12. Documentation of Alleged Hydraulic Spill in Aft Portion of Main Deck

According to the Operations Group Chairman, the airplane sustained a serious hydraulic fluid spill in the aft portion of the main cargo deck, on about 3/20/2011. Based on the date, the spill would have occurred while the accident airplane was owned by a previous owner.

In response to the group's inquiry, National Airlines indicated to the group that they had no knowledge of the event. The airlines provided a letter from the previous owner certifying that the airplane did not experience "any incident, accident or subjected to major failure, fire, over-temperature outside of normal operation, immersion in salt water or otherwise exposed to corrosive agents". The letter included the time period of the alleged hydraulic fluid spill.

In addition, National Airlines provided a package of work cards (Tasks 53-720-00-01 and 53-720-02-01) related to inspections in the aft cargo area during the last "D" check, accomplished in August, 2012. The group examined the documents and found no evidence of a hydraulic fluid spill.

13. Examination of Service Difficulty Reports (SDR)

The FAA's service difficulty report (SDR) database was reviewed for the calendar year prior to the accident for the airplane, using the airplane's serial number for the search. The SDRs were reviewed with no significant findings.

14. Principal Maintenance Inspector Interview

The FAA's principal maintenance inspector (PMI) for National Airlines was interviewed by the NTSB Operational Factors Specialist on September 24, 2013. A synopsis of the interview can be found in Section A.24 of Attachment 1 - Interview Summaries of the Operational Factors Specialist's Factual Report.

15. Documents Provided to the Group

National Airlines provided electronic copies of, and the group reviewed, the following documents:

1. Aircraft Maintenance Log pages for 2012 and 2013
2. "A" Check packages from 01/10/2013 and 4/15/2012
3. Documentation related to Over Weight Pallet Inspection, February 2012
4. Documentation related to Reported Hydraulic Fluid Spill, 2011
5. Contract Maintenance Provider Information
6. National Airlines B747 MEL/CDL Revision 3 (Current at time of accident)
7. D072 Operations Specification dated 07/13/2012
8. National Airlines B747 MSG-3 Inspection Manual, Revision 2
9. Files related to Airworthiness Directive Status for Airframe, Engine, and APU
10. National Airlines STC/Modifications List
11. Files related to Maintenance Delay Reports
12. Most Recent Weight and Balance Documentation, dated August 3, 2013

Tom Jacky
Aerospace Engineer

ATTACHMENT 1

Maintenance Inspection Summary from WinAir Software

Task - Summary

Work Order: 120164 Task: 176

Description: L/P 7594-1 M Due to ZFW exceeded by 1358 Kgs. and pallet positions #1, 1A, 22, and position 33 a o...

Task No.: 176 Work Order: 120164 - UNSCHED2012 Origin: Maint - Unscheduled

Aircraft: N949CA Customer: NAT105 - NATIONAL AIRLINES

ATA: 05-00-00 Created: 2012-02-17 By: BEAU01

Base: OMDW Current Status: Complete Due Date: ...

Summary Required Parts Requisitions Notes

Print

Edit

Details

Task Description:

L/P 7594-1 M Due to ZFW exceeded by 1358 Kgs. and pallet positions #1, 1A, 22, and position 33 a over weight landing insp. required. (max allowable ZFW 276,691 Kgs.)

ATA: 05-00-00 INSPECTIONS

Defect

Defect Type: Origin: Maint - Unscheduled

Zone: Parent WO-Task: -

Position: Description:

Planning

Base: OMDW Billing Code:

Start Date: Due Date:

Skill Shop Est. Market Est. Regular / Overtime

INSPECT 0.00 0.00 0.00 h / 0.00 h

Completion

Flight Log: 495 Hours: 74,770.7

Vol / Page: 1 / 7594 A/F Cycles: 10,220

Date: 2012-02-16 Landings: 10,220

APU Hours: 22,153.2

Corrective Action:

Performed detailed over weight landing insp. IAW 747-400 AMM 05-51-39 phase 1 option A. No defects noted at this time. Ref Boeing letter MUA-MUA-12-0004-03B)

Mechanic: YOUN01 LOUIS YOUNG , License: 10271

Inspector: YOUN01 LOUIS YOUNG , License: 10271

Status

Status: Complete [Change](#)

Created: 2012-02-17 by BEAU01

Status Changed: 2012-03-07 by BEAU01

ATTACHMENT 2

Log page documenting the Maintenance Inspection

AIRCRAFT MAINTENANCE LOG



7594 ✓
Records Audited SW

AIRCRAFT TAIL NUMBER: N949CA
AIRCRAFT TYPE: B747-400

LEG	FLT #	DATE UTC	STATION		UTC		BLK HRS	UTC		FLT HRS	LDGS	OIL ADDED						
			FROM	TO	OUT	IN		OFF	ON			1	2	3	4	APU		
1																		
2																		
3																		
4																		
			TOTAL		152		TOTALS											

AIRWORTHINESS RELEASE

CHECK CW: NON ✓

DATE: 2-16-12

UTC TIME: 1100Z

STATION: OMDW ✓

CERT #: 10271

AUTH SIG: [Signature]

P/A	CREW NAME	EMPL. #	P/A	ADDITIONAL CREW /FM/LM/ OTHER	EMPL. #	APU CYCLES	TIME CONVERSION CHART				
						FLT	MX	0-3	0	28-33	.5
				MAINT ONLY				4-9	.1	34-39	.6
								10-15	.2	40-45	.7
								16-21	.3	46-51	.8
								22-27	.4	52-57	.9
										56-60	1.0

LOWER LANDING MINIMUMS

CAT	ALA	STA	RWY	EVAL	ACT SAT	UNSAT
II	IIIa	IIIb				ATC/FAC/EQUIP

#	SOURCE	DISCREPANCY	CORRECTIVE ACTION	SIGN OFF
1	C (M) FRM CODE	Due To ZFW Exceeded by 1358 Kgs and pallet positions #1, 2A, 22, and position 33 a over weight handling inspr Required. (max Allowable ZFW 276,691 Kgs)	1 RII Y (N) Performed Detailed Over weight handling INsp. IAW 747-400 AMM 05-51-25 phase I option A No Defects Noted At This Time. 39 Ref Boeing Letter MUA-MUA-12-0004-03B	DATE: 2/16/12 STA: OMDW ✓ TECH: [Signature] CERT/EMP: 10271 ✓ RII: CERT/EMP:
2	C M FRM CODE		2 RII Y N	DATE: STA: TECH: CERT/EMP: RII: CERT/EMP:
3	C M FRM CODE		3 RII Y N	DATE: STA: TECH: CERT/EMP: RII: CERT/EMP:
4	C M FRM CODE		4 RII Y N	DATE: STA: TECH: CERT/EMP: RII: CERT/EMP:

#	PART NAME	PART # ON	SERIAL # ON	PART # OFF	SERIAL # OFF	POSITION	REMARKS
1			MAR 07 2012 ENTERED				
2							
3							
4							

CHECK BOX IF DISCREPANCY OR MAINTENANCE ACTION CARRIED FWD TO NEXT PAGE BOOK CHANGED-RECORD FIRST PAGE OF NEW LOG BOOK:

ATTACHMENT 3

Inspection Recommendation Letter from Boeing

SiebelLongEmailBody_1-Z0YSM7.txt

FROM: THE BOEING COMPANY
TO: National Air Cargo Group (MUA)
[MESSAGE NUMBER:MUA-MUA-12-0004-03B] Boeing Response
MESSAGE DATE: 15 Feb 2012 2315 US PACIFIC TIME / 16 Feb 2012 0715 GMT

The following message is distributed to the following people at National Air Cargo Group:
Jack Fauth

Field Service Base: BFSSSC

Service Category: Airplane Model: 747 Series/Product: 747-400
ATA: 0551-00

SUBJECT: MUA - N949CA ** AOG Aircraft **

AIRPLANE (VARIABLE/SERIAL): RT075/25630 REGISTRY: N949CA Flight Hours:
74770.7 Flight Cycles: 10220

INQUIRY TYPE: Airplane Repair FAA Form 8100-9 Requested: No Repair Design
Record Requested: No

REFERENCES:

/A/ MUA-MUA-12-0004-01C
/B/ 747-400 AMM 05-51-39

DESCRIPTION:

The Ref /A/ message reported MUA airplane RT075 experienced an over weight landing. MUA provided the cargo deck positions and amount of overload. Boeing was requested to review the information and provide any additional inspections if required.

RESPONSE:

The Ref /A/ message has been reviewed. Boeing recommends MUA also perform a general visual inspection of the overloaded cargo positions. If no discrepancies are found after inspecting the overloaded cargo positions and after accomplishment of the Ref /B/ inspections, then no additional inspections are required.

Note: No special access is required for the general visual inspection. Review the cargo floor area for distortion, broken or cracked tracks and fittings, etc.

If attachments are referred to, and are not present, please reply to this e-mail or contact your Boeing Field Service Representative.

Enhanced Controls Required?:No

Summary Notes:

Shon Jackson
Customer Support Engineering - Structures

Darrin T. Toth
Operations Center