

Memorandum

Federal Aviation Administration
NWA Certificate Management Office
2901 Metro Drive, Suite 500
Bloomington, MN 55425

ACTION: Safety Recommendation for Accident
Prevention Order: 8020.11

August 22, 2005

From:
Aviation Safety Inspector
NWA-Certificate Management Office

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~~XXXXXXXXXX~~
FAX: ~~XXXXXXXXXX~~

To:
Manager, AAI-200
Recommendation & Quality Division

The following safety recommendation is submitted as provided in FAA Order 8020.11B, Chapter I, Paragraph 15., FAA Safety Recommendation Program. As provided for in this reference, FAA "Inspectors should be alert for issues that warrant corrective action, whether they arise during an investigation or other duties."

The submitting inspector believes that a situation exists that jeopardizes life or property and telephone contact to AAI-200 has been made. The issues of safety concern presented have been briefed to submitting inspector's supervisor and manager.

In the interest of public safety regarding Northwest Airlines present public safety risk, due to the mechanics' AMFA Union strike, this Safety Recommendation is being submitted as provided for in FAA Order 8020.11. Because the reporting inspector believes a situation exists that jeopardizes life or property, this written recommendation has been fax'd to AAI-200.

REFERENCES:

Air Transportation Oversight System (ATOS), FAA Order 8400.10 Appendix 6
FAA's Program Tracking Reporting System (PTRS)
FAA Order 8300.10, Airworthiness Inspector's Handbook

FAA "Human Factors in Aviation maintenance and Inspection" CD-Rom
NTSB Accident Investigations:
<http://hskysway.faa.gov/NTSB/pxcdll/NTSB/176r-mainu-j-ntsb.htm?df=templates>

(The NTSB reference program contains twenty-four accident investigation reports. The reports included in this reference all have maintenance as a contributing factor in the cause of an aircraft accident. Paper copies of the reports were made available for this project by NTSB member, The Honorable John Goglia. The program's full-text search and hyperlinking capabilities provide valuable tools for researchers and maintenance personnel to review data related to past accidents.) The database includes a Northwest Airlines B747 report, partial engine separation from the wing.

NTSB Report # NTSB/SIR-94/02, Northwest Airlines Boeing B-747, N637US

Probable cause: "Maintenance and Inspection personnel who worked on the aircraft were not adequately trained and qualified to perform the required maintenance and inspection functions."

Contributing factors: "The work environment for heavy maintenance of the airplane was inadequate and contributed to an error-producing situation for the workers."

BACKGROUND:

On August 20, 2005, Northwest Airlines aircraft mechanic's union began a strike against Northwest Airlines. The airline, in preparation for a strike, located and hired replacement mechanics to accomplish aircraft maintenance while continuing passenger and freight flight operations. Northwest Airlines was to provide their maintenance training to replacement workers. In addition, Northwest was to provide maintenance training to existing employed aircraft maintenance management personnel and other office assigned personnel that held Airframe and Powerplant Airman Certificates. Some of these employees have been away from working on aircraft for a number of years. The replacement mechanics as well as the displaced existing maintenance managers/employees were to accomplish aircraft maintenance and inspection tasks to the aircraft and aircraft components.

Northwest Airlines maintenance training program does not teach skills necessary for mechanic competency on the aircraft they operate. This has been an unresolved, ongoing safety concern with the airline by many FAA Northwest Airlines Certificate Management Safety Inspectors. It was also the probable cause cited by NTSB in report # NTSB/SIR-94/02, involving engine separation of a Northwest Airlines' Boeing B-747 aircraft. This concern was repeatedly shared with FAA office supervisors and managers during Northwest Airlines' preparation for a mechanic's strike.

Prior to the strike, and during the first days of the strike, this reporting inspector as well as others present, again shared concern with Northwest Airlines' training of replacement mechanics. It was again stressed that competency of the mechanic to perform was questionable because proper accomplishment of maintenance tasks is not taught in Northwest Airlines' training programs. The office manager's response was that we would have to observe this competency as Northwest operated and trend maintenance errors to see if there would be a training problem. The concern of experienced, knowledgeable FAA safety inspectors was not heeded.

This "wait and see what happens" approach by FAA management is not the current attempt by the FAA to manage air safety risks. This is the "tombstone" mentality of the FAA that they were accused of during the Value Jet accident investigation. An accident caused by maintenance related errors, vendor outsourced errors. FAA's newest program, Air Transportation Oversight System (ATOS), of which Northwest Airlines is under, was to bring in risk management elements. It was hoped that ATOS would allow the FAA to evaluate potential risks and indicators that could lead to an accident and intervene before an accident occurred. System Safety Attributes were to be built into the airlines' operation such that safe operations were assured.

Today, after Northwest Airlines has been operating under the FAA ATOS surveillance program, you will notice no difference in their procedures than previous to ATOS. The ATOS process stressed system safety attributes to be built into the airlines processes. You will, today, see no clear written procedures detailing the ATOS safety attributes of Responsibility, Authority, Procedures, Controls, Process Measurement, or Interfaces written into their processes.

ATOS was also envisioned to be a surveillance system that was flexible and would react promptly to changes in the airlines' operation. A process called "retargeting" was to allow the FAA to rapidly adjust its surveillance plan based on changes with the airline.

The retargeting of FAA's surveillance plan as a result of the major change occurring at Northwest Airlines did not occur. Application of ATOS risk assessment due to the complete turn over of maintenance personnel and the large number of manual revisions did not occur. The ATOS Data Collection Tools are also not being utilized for data collection so that risk assessment can be done based on data. The PTRS database is also not being utilized. Instead, the office has developed their own paper checklists with no interface with the automation of ATOS or PTRS for computerized data collection.

ATOS has a tool called ACAT, the Air Carrier Assessment Tool. It is intended to be a matrix design to analyze and assess the elements of an air carrier's systems using a series of risk indicators. There are definitions and criteria for thirty-one risk indicators to aid the Principal Inspectors in developing surveillance requirements based on the impact these risks may have on the air carrier.

This tool was not utilized, via a facilitated meeting of inspectors and Principal Inspectors, to evaluate the risks to safety with a mechanic's strike at Northwest Airlines. Some of the indicators that are impacted are:

- 1) Change in air carrier management: "Cost cutting and greater bottom line pressure can undermine or dilute an air carrier's quality orientation and may lead to reduced emphasis on safety. Northwest has reassigned maintenance support managers (office position persons) to line maintenance performing repair and inspection tasks. This causes a couple of risk situations. First, it reduces their oversight of the maintenance operation from a program or system perspective. Second, it has placed

manager persons in an environment requiring mechanical skills and competencies to repair and inspect the aircraft, of which many have not performed these skill tasks for many years. They have moved from office responsibilities to hands on the aircraft repair responsibilities. Northwest's maintenance training program does not require "hands on training" nor is there any type of evaluation process that ensures they are "fully informed about procedures and techniques and new equipment in use and is competent to perform his duties." (14 CFR 121.375).

2) **Turnover in Personnel:** "A loss of personnel can dramatically increase the potential for failure in one of the air carrier's systems." "A high turnover in personnel, across the air carrier, or within the maintenance or operations organizations, should always raise a concern."

Due to the AMFA Union strike at Northwest, Northwest replaced aircraft line and component shop mechanics, aircraft lavatory and potable water servicing personnel and aircraft cleaning personnel. In one day, all these positions had replacement workers. "Loss of the most experienced personnel...should always raise a concern."

Northwest had been reducing their mechanics work force and as such, only the most experienced mechanics were still employed. Striking mechanics had 15-30 years plus with Northwest Airlines. "Further consider the issue of training..."

Training of the replacement mechanics was a concern raised by FAA safety inspectors. The present operation is proving that training to ensure competency to perform (14CFR 121.375) was lacking. Maintenance errors are being made by both Northwest management employees that were reassigned and replacement workers, both aircraft mechanics and lavatory servicing personnel.

3) **Labor-Management Relations:** Northwest Airlines has made the decision to replace their work force. Now, what exists is strife from striking mechanics and frustration and weariness from replacement workers. Replacement workers that have been temporarily relocated from their homes and families, not knowing how long this will last, if it will be permanent or temporary. Further, the replacement work force was not permitted to bring their personal tools but are required to use the tool box provided by Northwest. As such, frustration has been observed by the replacement work force because they are lacking hand tools they have been accustomed to using.

4) **Inspection Department/System:** Northwest has replaced all their inspection department mechanics due to the strike. At Northwest, these were veteran mechanics that were employed as aircraft inspectors. These inspectors performed non-destructive inspection tasks, bore scopes of aircraft engines, receiving inspections and required inspection item tasks (RII). Tasks where experience is necessary and where a separation between inspection and production was clearly evident.

Northwest has placed ex-production management into some of these inspection roles. Hence, the separation has clouded. "If the lines of distinction are not clear between these two functions, there may be cause of concern." Due to the poor financial state of the airline, all employee groups are trying to produce and keep airplanes flying. An environment detrimental to quality control.

The Northwest Airlines Director of Inspection has released correspondence stating that during receiving inspection, "Receiving Inspection will not mandate compliance to the new VSPM (Vendor Shop Practices Manual), including requirements for part references, until further notice." The Vendor Shop Practices Manual has requirements for maintenance actions and reporting required of the Northwest Airlines PAA Approved Reliability Program.

When this reporting inspector questioned the authority of the Director of Inspection to negate Northwest procedures developed by committee, solely by himself, he stated that received aircraft parts were backing up. They had to process these parts so they could get into the stock system. There were too many rejections because the outsource vendors were not following Northwest procedures.

A clear separation of Inspection and Production is not being held by the Northwest Airlines' Director of Inspection.

5) **New/Major Changes to Program:** Northwest has now outsourced most of its component repair. As such, the processing of vendor repairs has resulted in repairable units backlogged in the stock room process. Prior to the strike, many components that did go outsourced were processed by mechanics in the shops. Even the control and shipping of repairable parts at outstations many times was done by mechanics. These persons are now gone.

Repairable parts are not protected in the parts routing processes. Electro-static sensitive devices (ESD), such as navigation, communication and flight control components have been handled without the ESD protection. Further, components that are fragile are stacked in plastic tubs with components that are heavy with no protection around the parts. This was an issue identified prior to the strike and no corrective action has been taken.

Northwest has yet to obtain full compliance by vendors of their component repair and documentation requirements. Parts and component repair process is of major safety concern due to special operations by Northwest Airlines in Lower Landing Minimums (LLM), Long Range Navigation, Reduced Vertical Separation Minimums (RVSM) and Extend Two-Engine Operations (ETOPS). Operations dependent on component reliability and proper functionality. Since mentioning Northwest's ETOPS program, also be advised the person who normally oversees the Northwest ETOPS maintenance operation is now also performing aircraft maintenance.

6) CAS System (Continuing Analysis and Surveillance) (Airworthiness Only)

Consider changes to the CAS system in terms of the impact they may have on the performance and effectiveness of the Inspection Department. In addition, consider how the change might affect the air carrier's capability to identify, isolate, and correct deficiencies in the program regardless of whether the programs are carried out by the certificate holder or by another entity.

Northwest Airlines' maintenance errors are occurring at a rate higher than their present auditing staff can oversee. Outsource component vendors are not complying with Northwest procedures. This is known by Northwest. Yet, Northwest does not have the audit staff to audit and ensure compliance with Northwest procedures by all their vendors.

FAA safety inspectors have and continue to observe employee and vendor employee errors in the accomplishment of aircraft maintenance, inspection and servicing tasks. Observations such as:

a) A Northwest employed line maintenance manager not able to comply with an Airbus A320 engine run checklist. He was not able to locate required switches on the aircraft instrument panel. In questioning the manager, it was learned he had never performed an engine run on a live A320 aircraft. He had only recently been trained in a simulator. This reporting inspector suggested he get help and this suggestion was initially ignored. After a few more minutes of struggling, the manager did call for help. The engine was started, however, the initial manager forgot to turn on the number 2 engine fuel pump switches. A fault was on the panel.

b) Observed a vendor, Globe Services, complete lavatory servicing on a Northwest Boeing B757-300, an ETOPS qualified aircraft. The lavatory servicing panel had a Northwest bright orange deferral sticker on it. This indicates the lavatory is inoperative and should not be serviced. The vendor had just completed servicing both lavatories. This reporting inspector questioned the two servicing individuals and their supervisor and neither of the three knew the meaning of the orange color deferral sticker. It was also learned that this was the second day either of these two persons had been on an airport and serviced aircraft lavatories. Their training was done by the vendor and consisted of a video supplied by Northwest Airlines. Protective face masks were not used during the servicing operation. Northwest maintenance and ground servicing management persons were called. The maintenance manager was not sure what to do and it was suggested to him that the lavatory needed to be drained and if there was a leak, then a leak check was necessary. He was informed to check the Northwest procedure for an inoperative lavatory. They must ensure no fluid leaked into the structure of the aircraft. Northwest ground service management informed they would have their management people do training today. They had been called.

Later that day, this inspector observed Northwest management observing lavatory servicing on a DC9 aircraft. The vendor supervisor that was involved earlier was

servicing the lavatory. He had no gloves or face mask on, as required by Northwest procedure for handling hazardous human body fluids. The Northwest manager was standing there watching this. This FAA inspector pointed out to the Northwest manager that masks and gloves were not being used. The manager questioned if that was necessary. I informed it was their procedure.

c) Northwest DC10 aircraft arrival from Amsterdam to Minneapolis. Aircraft arrived into Minneapolis with a broken lavatory waste duct which allowed human waste to spill into the aircraft's electrical equipment bay. This bay contains the aircraft flight and navigational appliances and waste contaminants were observed spilled out on these components. When FAA questioned the Northwest maintenance manager about clean up, he was told that it came in this way from Amsterdam with no pilot write-ups so there was no reason it could not depart this way to Honolulu. FAA stepped in and ensured aircraft was cleaned and checked out before a next flight.

d) Northwest Airlines DC10 aircraft in hanger maintenance for fuel quantity discrepancy. Right hand wing fuel tank was opened for repairs. Tank was closed up without having a Northwest required inspection for an "OK to Close" prior to closing up the tank. No Northwest employee or vendor employee assured this inspection was done before the tank was closed up. After completion and while management reviewed the work documents, it was discovered that the "OK to Close" had not been performed. The aircraft was re-opened for the inspection.

e) On a Northwest Boeing B757, the vendor mechanic performing maintenance to the aircraft was not able to close the passenger entry door. He made attempts, but he could not close it. He was unsure how to close it. Fiddled around with it but did not ask for any help. These doors also have "arm" positions for slides when they are closed. A Northwest manager closed the door. When questioning the vendor mechanic, this inspector was told that he had only been a mechanic on a structures crew. He had never worked line maintenance. He has had no line maintenance experience in the past 2 years.

f) This FAA inspector spoke to the towbarless aircraft tug driver. In fact, the driver approached him to talk. The driver shared that he was on a 12 hour day and had only received about a 10 minute break. He has been moving airplanes around all day and was very tired. He was a Northwest Airlines' employee.

g) Observed a Northwest line manager working on a DC 9 aircraft navigation wing tip light. He had the access open and the panel laying on a ladder. The aircraft was boarded with passengers and ended up running late due to a nose wheel change. The manager left his unfinished work on the navigation light and became distracted in the delay due to the nose wheel. This inspector kept his eye on the disassembled navigation light. After some time with the manager caught up in the nose wheel, He finally remembered he had the navigation light apart. He made gestures and faulted himself that he forgot about the light. He then immediately went to finish the work he started. The manager was in work on a deferred MEL item for the light. There would not have been

an in progress work record for the work he was doing. It is worked off the log page and typically Northwest does not due any entries until the work is completed.

Northwest is placing too much demand on management personnel. They are expected to perform work and also oversee others work at the same time. In the fast paced, on time flight schedule of line maintenance, this is unacceptable. This is an environment for mistakes.

h) Another observation of Northwest line maintenance management distracted in repairing an aircraft while trying to oversee vendor maintenance. Northwest A320 aircraft with a engine bleed discrepancy. Engine cowl was open and two vendor mechanics were looking at the bleed valves. When they were questioned what they were contemplating for the repair, neither one of them knew. They both said they had never worked on A320 aircraft. They started looking at the engine for some time both wondering where the manager had gone. I found the manager on the flight deck working on a pitot heat problem. He was having trouble running the on board maintenance test. So again, we have a maintenance manager distracted in a repair while inexperienced vendor mechanics stand outside pondering a repair for another discrepancy. Upon review of the aircraft logbook, the engine bleed discrepancy had been written up five times in the past two weeks. It is a no go item.

i) Northwest work control: The Northwest Airlines work control procedures as described in their General Engineering and Maintenance Manual provides much of the work control be the responsibility of lead mechanics. Due to all mechanics out on strike, these positions do not exist. As such, the oversight of the actual work was the experienced lead mechanics for the work crew he was assigned. This does not exist anymore. Yet, Northwest has not revised their work control procedures to accommodate the present line structure nor does there appear to be any standard means of determining experience or qualifications for persons that would be placed in these positions.

j) Spoke to a number of vendor mechanics performing turn around checks on Northwest aircraft. One observed doing landing gear, brakes and wheels was questioned as to what he was looking at? He mentioned brakes and wear pins. When asked if these were checked with brakes on or off, he did not know. The brakes were not on when he was accomplishing his inspection. They must be set to properly check brake wear pins. Spoke to five vendor mechanics doing Airbus turn around checks. None of the five were aware of the wing fuel tank over pressure release indicators. They were not aware of the system they are in or what the white "X" meant.

Northwest Airlines does not have enough audit staff to oversee all the work presently being accomplished by vendor or re assigned maintenance employees.

There are some twenty more ACAT assessments that are contained in the ATOS surveillance process. This reporting inspector has not assessed them all. There is one for Outsourcing, Human Factors that are definitely appropriate for the present Northwest

operation. This recommendation is being submitted with these assessments not fully addressed due to the urgency to submit the following safety recommendations.

RECOMMENDATIONS:

In the interest of public safety, the following are recommended:

- 1) Northwest Airlines flight operation is reduced based on the ability of the mechanic and inspector work force to perform assigned duties and tasks without error. The number of aircraft operated and flights to be proportional to the number of qualified and competent maintenance/inspection personnel. A staffing and flight operation equivalent by ratio to the before strike environment. The ability of quality audit to oversee the work being performed must be a consideration for the amount of flight operations permitted.
- 2) An FAA Maintenance Error-Human Factors Evaluation Team is assembled and dispatched to oversight duties of Northwest Airlines operations. Any and all risks identified will be immediately corrected before any expansion or continuation of Northwest flight operations. PASS leadership to be involved.
- 3) FAA Safety Inspectors are given their Congressional Authority to intervene and halt, if necessary, any activity observed that may impact person or property safety. There shall be no retribution or coercion by FAA Management in the performance of FAA Inspector safety duties.
- 4) A separate FAA management group is established to manage surveillance on Northwest Airlines. A group that is disconnected from the assigned Principal/Management group. PASS to be part of this group and to have an equal say in the group participants. This group is to be under PASS/Management Partnership and not under management of the Great Lakes Region.
- 5) Revise Northwest Airlines' aircraft mechanic/inspector training programs. Training program must teach the performance of tasks and ensure competency of the individual prior to work or assigned duties being performed by the individual. All personnel must complete this training and be observed competent to perform prior to accomplishing any tasks to aircraft operating. Full compliance and assurance of compliance with 14 CFR, 121.375 must be met by all individuals.

Attachments (2)

Facts of Northwest Boeing B747 NTSB Report, Engine Separation
Maintenance Error Analysis Intervention, FAA Human Factors CD-ROM
Email Recommendations to Nick Sabatini, FAA, March 7, 2002