

Aircraft Accident Preliminary Investigation Report

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**NATIONAL
TRANSPORTATION
SAFETY
COMMITTEE**

**PT. Lion Air
PK – LIO
Boeing McDonnell Douglas MD-90
Hang Nadim Airport
Batam-Kepulauan Riau
Republic of Indonesia**

23 February 2009



**NATIONAL TRANSPORTATION SAFETY COMMITTEE
DEPARTMENT OF TRANSPORTATION
REPUBLIC OF INDONESIA
2009**

This Preliminary Factual Report was produced by the National Transportation Safety Committee (NTSC), Karya Building 7th Floor Ministry of Transportation, Jalan Medan Merdeka Barat No. 8 JKT 10110, Indonesia.

The report is based upon the initial investigation carried out by the NTSC in accordance with Annex 13 to the Convention on International Civil Aviation, Aviation Act (UU No.1/2009), and Government Regulation (PP No. 3/2001).

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GLOSSARY OF ABBREVIATIONS

AD	Airworthiness Directive
AFM	Airplane Flight Manual
AGL	Above Ground Level
ALAR	Approach-and-landing Accident Reduction
AMSL	Above Mean Sea Level
AOC	Air Operator Certificate
ATC	Air Traffic Control
ATPL	Air Transport Pilot License
ATS	Air Traffic Service
ATSB	Australian Transport Safety Bureau
Avsec	Aviation Security
BMG	Badan Meterologi dan Geofisika
BOM	Basic Operation Manual
CAMP	Continuous Airworthiness Maintenance Program
CASO	Civil Aviation Safety Officer
CASR	Civil Aviation Safety Regulation
CPL	Commercial Pilot License
COM	Company Operation Manual
CRM	Cockpit Recourses Management
CSN	Cycles Since New
CVR	Cockpit Voice Recorder
DFDAU	Digital Flight Data Acquisition Unit
DGCA	Directorate General of Civil Aviation
DME	Distance Measuring Equipment
EEPROM	Electrically Erasable Programmable Read Only Memory
EFIS	Electronic Flight Instrument System
EGT	Exhaust Gas Temperature
EIS	Engine Indicating System
FL	Flight Level
F/O	First officer or Copilot
FDR	Flight Data Recorder
FOQA	Flight Operation Quality Assurance
GPWS	Ground Proximity Warning System
Hrs	Hours
ICAO	International Civil Aviation Organization
IFR	Instrument Flight Rules

IIC	Investigator in Charge
ILS	Instrument Landing System
Kg	Kilogram(s)
Km	Kilometer(s)
Kts	Knots (NM/hour)
Mm	Millimeter(s)
MTOW	Maximum Take-off Weight
NM	Nautical mile(s)
KNKT / NTSC	Komite Nasional Keselamatan Transportasi / National Transportation Safety Committee
°C	Degrees Celsius
PIC	Pilot in Command
QFE	Height above aerodrome elevation (or runway threshold elevation) based on local station pressure
QNH	Altitude above mean sea level based on local station pressure
RESA	Runway End Safety Area
RPM	Revolution Per Minute
SCT	Scattered
S/N	Serial Number
SSCVR	Solid State Cockpit Voice Recorder
SSFDR	Solid State Flight Data Recorder
TS/RA	Thunderstorm and rain
TAF	Terminal Aerodrome Forecast
TSN	Time Since New
TT/TD	Ambient Temperature/Dew Point
TTIS	Total Time in Service
UTC	Coordinated Universal Time
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions

SYNOPSIS

On 23 February 2009, a Boeing McDonnell Douglas MD-90 aircraft, registered PK-LIO, operated by Lion Air as flight number LNI-972, was scheduled to depart Polonia Airport Medan at 16.35 LT (09.35 UTC) for Hang Nadim Airport – Batam (Kepulauan Riau). The crew consisted of two pilots and four flight attendants. There were 156 passengers; 148 adults, four children, and four infants.

After takeoff, during the landing gear up procedure, the pilot noted one red light illuminate (nose gear) on the landing gear panel. During the investigation the pilots reported that they recycled the landing gear and the subsequent cockpit indication was that the landing gear was in the up and locked position. The pilots continued the flight to the planned destination Hang Nadim Airport, Batam.

During final approach at Batam, the pilots noted that the red light nose gear indicator was illuminated. The pilot in command (PIC) decided to conduct a go around and hold to perform the emergency checklist to attempt to extend the nose landing gear. After many attempts to extend the landing gear, the nose landing gear red indicator light remain illuminated. The PIC decided to make an emergency landing on runway 04 without the nose landing gear extended. The aircraft subsequently stopped on the runway 04 on the centre line.

Emergency personnel and vehicles from Hang Nadim Airport prepared for the emergency, and laid foam on the runway before the aircraft landed, to eliminate fire hazard.

The passengers and crew evacuated via the left front door escape slide. None of the occupants were injured.

The initial investigation found that the nose landing gear spray (water) deflector had fractured, jamming the nose landing gear in the up position.

The investigation is continuing and will include the operational procedures used during the flight to address the landing gear malfunction, and analysis of the mode of failure of the nose landing gear spray deflector.

With the issue of the Preliminary Factual Report, the NTSC made recommendations covering the inspection of nose landing gear spray deflectors fitted to MD-90 aircraft.

1 FACTUAL DATA

1.1 History of the Flight

On 23 February 2009, a Boeing McDonnell Douglas MD-90 aircraft, registered PK-LIO, operated by Lion Air as flight number LNI-972, was scheduled to depart Polonia Airport Medan at 16.35 LT (09.35 UTC) for Hang Nadim Airport – Batam (Kepulauan Riau). The crew consisted of two pilots and four flight attendants. There were 156 passengers; 148 adults, four children, and four infants.

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Emergency personnel and vehicles from Hang Nadim Airport prepared for the emergency, and laid foam on the runway before the aircraft landed, to eliminate fire hazard.

The passengers and crew evacuated via the front left door escape slide. None of the occupants were injured.



Figure 1: PK-LIO on runway at Hang Nadim Airport, Batam after accident

1.2 Injuries to Persons

Injuries	Flight Crew	Cabin Crew	Passengers	Total
Fatal	Nil	Nil	Nil	Nil
Serious	Nil	Nil	Nil	Nil
Minor	Nil	Nil	Nil	Nil
None	2	4	156	Nil
Total	2	4	156	Nil

1.3 Damage to Aircraft

The nose-section lower fuselage area of the aircraft was damaged due to the landing gear spray deflector striking the wheel bay during the retraction cycles. It was further damaged during the impact with the runway during landing roll.

1.4 Other Damage

There was no damage to other property.

1.5 Aircraft Information

Aircraft Registration	PK-LIO
Aircraft Serial Number	5390
Aircraft Manufacturer	Boeing McDonnell Douglas
Aircraft Type/Model	MD-90
Year of Manufacture	1996
Certificate of Airworthiness Valid Until	14 June 2009
Certificate of Registration Valid Until	14 June 2009
Compass Swing valid to	29 May 2009
Radio Permit Valid Until	20 June 2009
Total Airframe Hours	20770.37 TSN
Total Cycles	16795 CSN
Last Major Inspection C Check	09 July 2009

1.5.1 Landing Gear Information

Nose landing gear (Part number 5940497-501 and Serial number. CPI021), Time Since New 20,770 hours, and Cycles Since New 16,795. Inspection system overhaul interval 10 years and C check brace and links NLG. (CAMP MD-90).

There was no mandated inspection period for the nose landing gear spray deflector.

1.5.2 Weight and Balance

The aircraft was being operated within the approved weight and balance limitations.

1.6 Meteorological Information

Weather conditions were not a factor in this accident

1.7 Aids to Navigation

Not relevant to this accident

1.8 Communications

The crew had no difficulty communicating with air traffic control during the occurrence.

1.9 Aerodrome Information

Airport Name	:	Batam / Hang Nadim
Airport Identification	:	WIDD
Elevation	:	126 feet
Airport Operator	:	Directorate General Civil Aviation
Class	:	1
Runway Direction	:	04/22
Runway Length	:	4,025 meters
Runway Width	:	45 meters
Surface	:	Asphalt

1.10 Wreckage and Impact Information

The nose landing gear right spray (water) deflector had fractured and became detached. The center deflector was broken.

The nose gear could not be put in gear down position due to the damage and distortion of the spray deflector, which caused it to jam against the wheel bay structure.

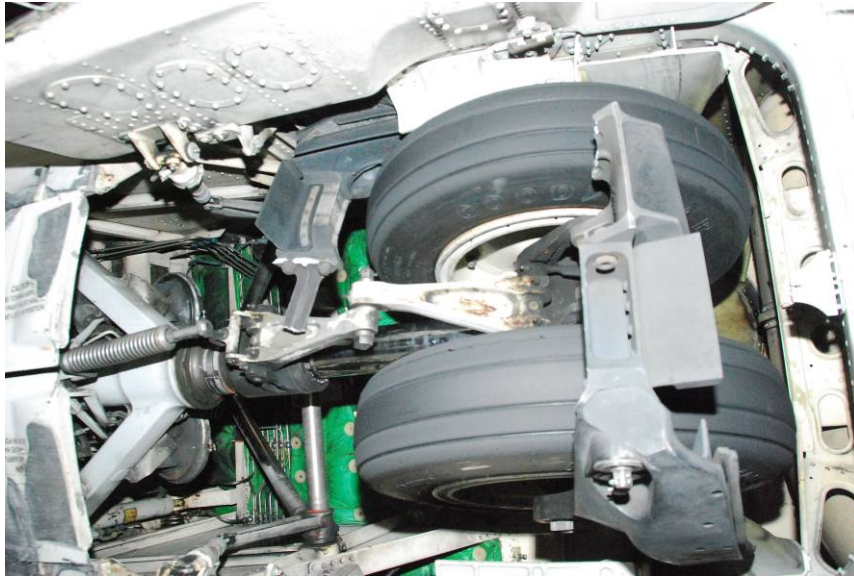


Figure 2 Damaged and distorted nose landing gear spray deflector



Figure 3 The fracture surface shows a dark colored portion indicating a pre-existing crack.

1.11 Medical and Pathological Information

Not relevant to this accident.

1.12 Fire

There was no pre-or post-accident fire.

1.13 Survival Aspects

Not relevant to this accident.

1.14 Tests and Research

Not relevant to this accident.

1.15 Organizational and Management Information

1.15.1 P.T Lion Mentari Airlines

Aircraft Owner : P.T Lion Mentari Airlines

Aircraft Operator : P.T Lion Mentari Airlines

Trading as : Lion Air

2 CONCLUSION

The investigation is continuing and will include the operational procedures used during the flight to address the landing gear malfunction, and analysis of the mode of failure of the nose landing gear spray deflector.

3 RECOMMENDATION

3.1 Recommendation to Lion Air and operators of MD-90 aircraft

The National Transportation Safety Committee recommends that Lion Air and other Indonesian operators of MD-90 aircraft review the nose landing gear inspection procedures to ensure:

- a) The nose landing gear spray deflector fitted to MD-90 aircraft is inspected for cracks at each nose wheel tire change.
- b) The adequacy of the crack inspection/detection procedures.

3.2 Recommendation to the Directorate General of Civil Aviation

The National Transportation Safety Committee recommends that the Directorate General of Civil Aviation mandate an inspection requirement, specifying inspection procedures and intervals for crack detection of the nose landing gear spray deflector fitted to MD-90 aircraft.