



**KOMITE NASIONAL KESELAMATAN TRANSPORTASI
REPUBLIC OF INDONESIA**

PRELIMINARY

KNKT. 18.04.09.04

Aircraft Serious Incident Investigation Report

PT. Lion Mentari Airlines

Boeing 737-900 ER Aircraft; PK-LFK

On-route Jakarta to Jambi, Indonesia

1 April 2018

2018

This preliminary investigation report was produced by the Komite Nasional Keselamatan Transportasi (KNKT), Transportation Building, 3rd Floor, Jalan Medan Merdeka Timur No. 5 Jakarta 10110, Indonesia.

The report is based upon the initial investigation carried out by the KNKT in accordance with Annex 13 to the Convention on International Civil Aviation Organization, the Indonesian Aviation Act (UU No. 1/2009) and Government Regulation (PP No. 62/2013).

The preliminary report consists of factual information collected until the preliminary report published. This report will not include analysis and conclusion.

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Jakarta, June 2018

KOMITE NASIONAL
KESELAMATAN TRANSPORTASI

Chairman



SOERJANTO TJAHOJONO

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ABBREVIATIONS AND DEFINITIONS

AFML	:	Aircraft Flight & Maintenance Log
AMEL	:	Aircraft Maintenance Engineer License
AMM	:	Aircraft Maintenance Manual
AMSL	:	Above Mean Sea Level
AOC	:	Airline Operator Certificate
ATPL	:	Airline Transport Pilot License
C of A	:	Certificate of Airworthiness
C of R	:	Certificate of Registration
CPC	:	Cabin Pressure Controller
CPL	:	Commercial Pilot License
CVR	:	Cockpit Voice Recorder
DDG	:	Dispatch Deviation Guide
DMI	:	Deferred Maintenance Item
FA	:	Flight Attendant
FCOM	:	Flight Crew Operating Manual
FDR	:	Flight Data Recorder
ft	:	Feet
ICAO	:	International Civil Aviation Organization
KNKT	:	<i>Komite Nasional Keselamatan Transportasi</i> is investigation authority of Indonesia also known as National Transportation Safety Committee (NTSC)
LRU	:	Line Replacement Unit
LT	:	Local Time
MEL	:	Minimum Equipment List
NNC	:	Non-Normal Checklist
PF	:	Pilot Flying
PIC	:	Pilot in Command
PM	:	Pilot Monitoring
psi	:	Pounds per square inch
QRH	:	Quick Reference Handbook
SIC	:	Second in Command
UTC	:	Universal Coordinated Time

WO : Work Order

SYNOPSIS

On 1 April 2018, a Boeing 737-900 ER aircraft with registration PK-LFK was being operated by PT. Lion Mentari Airlines (Lion Air) as a scheduled passenger flight from Soekarno Hatta International Airport, Jakarta (WIII) to Sultan Thaha Airport, Jambi (WIJJ) with flight number LNI600.

The Aircraft Flight Maintenance Log book recorded a problem from the previous day flight, that during descent, cabin rate of descend difficult to control. The problem unable to be solved and the engineer issued Deferred Maintenance Item (DMI). The aircraft was planned to depart with single Cabin Pressure Controller (CPC) operated which was allowed according to the Minimum Equipment List (MEL).

The engineer informed that maintenance action as stated in Dispatch Deviations Guide (DDG) had been conducted. The pilots conducted operation actions stated in DDG, during pre-flight check. Prior to the completion of the action, a ground staff came to the cockpit and reminded the PIC that the flight was behind the schedule. Thereafter the PIC asked to initiate the passenger boarding process.

At 0609 LT (31 March 2018, 2309 UTC), on daylight condition, the LNI600 departed with 213 persons on board consisted of two pilots, five flight attendants and 206 passengers.

During climbing passing altitude 8,000 feet, the pilot noticed the cabin vertical speed climbed excessively. The pilot checked the pressurization control panel and noticed the cabin pressure control selector was in manual position. Thereafter, the pilot manually selected the outflow valve selector to open. When passing altitude about 10,000 ft, the cabin altitude aural warning activated and the cabin altitude warning light illuminated. The pilot decided to maintain altitude at 10,000 ft for a while and pressed the ALT HORN CUTOFF button and cabin altitude aural warning stopped.

At 0620 LT, the the aircraft continued to climb to altitude 18,000 ft and two minutes later, the flight attendant 1 reported that passenger oxygen masks dropped. The pilot contacted to Jakarta Lower North Control requested to divert to Palembang due to pressurized problem. The controller acknowledged and instructed LNI600 pilot to maintain 15,000 ft and direct to Palembang.

At 0703 LT, the aircraft landed at runway 29 of Sultan Mahmud Badaruddin II airport Palembang and taxi normally to parking stand. After parking, the pilots noticed that cabin differential pressure indicated 5.8 psi and the cabin altitude indicated negative value. The PIC discussed with the ground engineer and suggested by ground engineer to manually open the outflow valve. After the out-flow valve manually opened, the cabin altitude and differential pressure indicated zero and the passenger door could be opened normally.

No one injured and no damage to the aircraft in this serious incident.

Prior to issuing this preliminary report, the *Komite Nasional Keselamatan Transportasi* (KNKT) had been informed of safety actions taken by Lion Air resulting from this occurrence. KNKT acknowledged the safety actions taken however, there still remain safety issues that need to be considered. Therefore, the KNKT issues safety recommendation addressed to Lion Air in this Preliminary Report.

The investigation is continuing and KNKT plans to complete the investigation within 12

months since the day of the occurrence. Should any further relevant safety issues emerge during the course of the investigation, KNKT will immediately bring the issues to the attention of the relevant parties and publish as required.

1 FACTUAL INFORMATION

1.1 History of the Flight

On 1 April 2018, a Boeing 737-900 ER aircraft with registration PK-LFK was being operated by PT. Lion Mentari Airlines (Lion Air) as a scheduled passenger flight from Soekarno Hatta International Airport, Jakarta (WIII)¹ to Sultan Thaha Airport, Jambi (WIJJ) with flight number LNI600.

The Aircraft Flight Maintenance Log book recorded a problem from the previous day flight, that during descent, cabin rate of descend difficult to control. The problem unable to be solved and the engineer issued Deferred Maintenance Item (DMI) and the aircraft was planned to depart with single Cabin Pressure Controller (CPC) operated which was allowed according to the Minimum Equipment List (MEL).

Prior to flight, the engineer informed to the Pilot in Command (PIC) regarding the malfunction of one of CPC. The engineer informed that maintenance action had been conducted as stated in Dispatch Deviations Guide (DDG) and reminded to the PIC to conduct operation actions stated in DDG.

The pilots conducted operation actions stated in DDG during pre-flight check. Prior to the completion of the actions, a ground staff came to the cockpit and reminded the PIC that the flight was behind the schedule. Thereafter the PIC asked to initiate the passenger boarding process. After completed the passenger boarding process, the engine starting was normal.

At 0609 LT (31 March 2018, 2309 UTC²), on daylight condition, the LNI600 departed from Jakarta with 213 persons on board consisted of two pilots, five flight attendants and 206 passengers. The PIC acted as Pilot Flying (PF) and the Second in Command (SIC) acted as Pilot Monitoring (PM). The flight was the first flight of the day for the crew and aircraft.

During climbing passing altitude 8,000 feet, the pilot noticed the cabin vertical speed climbed excessively. The pilot checked the pressurization control panel and noticed the cabin pressure control selector was in manual position. Thereafter, the pilot manually selected the outflow valve selector switch to open.

At 0614 LT, when passing altitude about 10,000 ft, the cabin altitude aural warning activated and the cabin altitude warning light illuminated. The pilot decided to maintain altitude at 10,000 ft for a while. The pilot pressed the ALT HORN CUTOFF button and cabin altitude aural warning stopped.

At 0618 LT, the flight attendant informed to the pilot that the cabin temperature was warmer than normal.

At 0620 LT, the pilot requested to Jakarta air traffic controller (Jakarta controller) to climb to altitude 18,000 ft and was approved.

¹ Soekarno Hatta International Airport, Jakarta (WIII) will be named as Jakarta for the purpose of this report.

² The 24-hours clock in Universal Time Coordinated (UTC) is used in this report to describe the local time as specific events occurred. Local time is UTC+7 hours.

At 0621 LT, the cabin altitude aural warning activated and stopped after 16 seconds.

At 0622 LT, the flight attendant 1 (FA 1) reported to the PIC that passenger oxygen masks dropped. The other flight attendants instructed the passengers to don the oxygen masks. Thereafter, the flight attendants used oxygen portable masks, walked along the cabin to observe the passengers. Some passengers informed that the oxygen masks did not supply oxygen properly.

At 0623 LT, the pilot requested to Jakarta controller to maintain 15,000 ft and requested to divert to Sultan Mahmud Badaruddin II International Airport, Palembang (WIPP)³ due to pressurization system problem. The Jakarta controller acknowledged and instructed LNI600 to maintain altitude 15,000 ft and to fly direct to Palembang.

The FA 1 came to cockpit and informed to the pilot that the passengers were fine. The pilot informed to the FA 1 that the flight would be diverted to Palembang. The pilot asked the FA 1 to announce to the passenger that the flight would be diverted to Palembang.

At 0628 LT, the pilot contacted Palembang Approach controller (Palembang controller) informed that the flight diverted to Palembang and requested for descend clearance. The Palembang controller acknowledged then instructed to descend to altitude of 3,000 ft and to fly direct to waypoint EPBIN. The Palembang controller confirmed to the pilot whether any assistant required on arrival and was replied that the pilot required company engineer on arrival.

During descent, the pilot unable to control cabin pressurization and activated the outflow valve selector to open and close position.

At 0703 LT, the aircraft landed at runway 29 of Sultan Mahmud Badaruddin II airport Palembang and taxi normally to parking stand.

³ Sultan Mahmud Badaruddin II International Airport, Palembang (WIPP) will be named as Palembang for the purpose of this report.

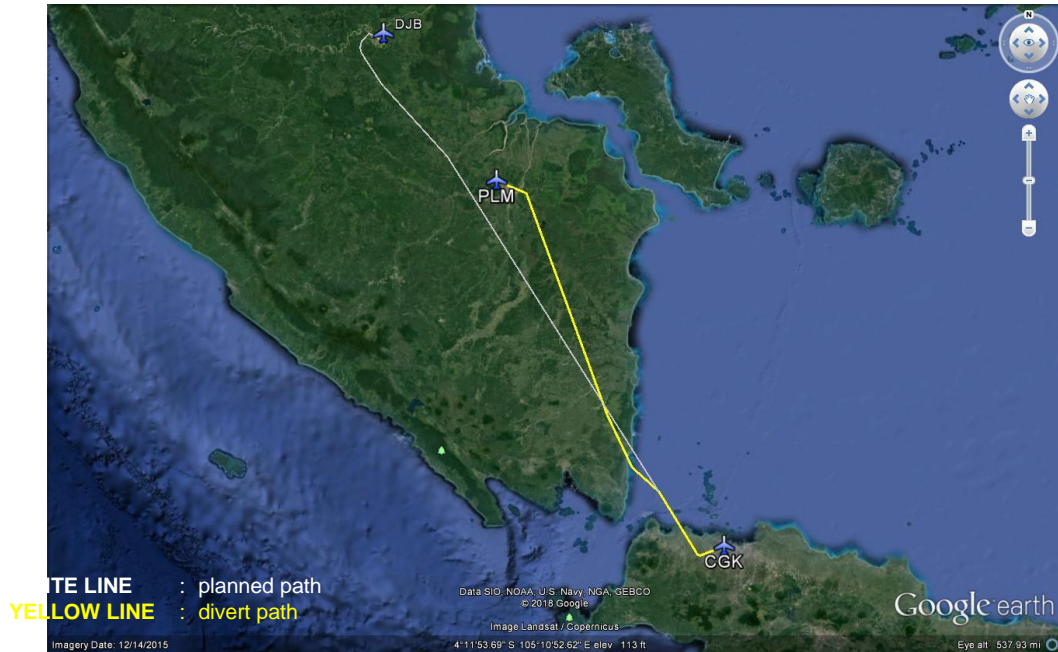


Figure courtesy of Google Earth

Figure 1: PK-LFK flight path

At 0708 LT, after parking, the pilots noticed that cabin differential pressure indicated 5.8 psi and the cabin altitude indicated negative value. The pilot informed to the flight attendant to delay the door opening process. The PIC discussed with the ground engineer of the cabin altitude and cabin differential pressure condition and suggested by ground engineer to manually open the outflow valve. After the out-flow valve manually opened, the cabin altitude and differential pressure indicated zero.

At 0716 LT, the aircraft door was opened and passenger disembarked. No one injured and no damage to the aircraft in this serious incident.

1.2 Personnel Information

1.2.1 Pilot in Command

The pilot was 32 years old, joined the company since January 2012 and held a valid Airline Transport Pilot License (ATPL). The medical certificate was first class that valid up to 23 August 2018. The pilot last line check was performed on 3 November 2017 and last proficiency check was on 24 January 2018.

The flying experiences of the pilot were as follows:

Total hours	: 4,865 hours
Total on type	: 4,865 hours
Last 90 days	: 240 hours
Last 60 days	: 156 hours
Last 24 hours	: 1 hour 15 minutes
This flight	: 1 hour 15 minutes

1.2.2 Second in Command

The pilot was 25 years old, joined the company since March 2014 and held a valid Commercial Pilot License (CPL). The medical certificate was first class that valid up to 30 April 2018. The pilot last line check was performed on 22 July 2016 and last proficiency check was on 18 February 2018.

The flying experiences of the pilot were as follows:

Total hours	:	3,526 hours 15 minutes
Total on type	:	3,316 hours
Last 90 days	:	289 hours 15 minutes
Last 60 days	:	183 hours
Last 24 hours	:	1 hour 15 minutes
This flight	:	1 hour 15 minutes

1.3 Aircraft Information

1.3.1 General

The Boeing 737-900 ER aircraft manufactured on 2017 by Boeing Aircraft Company in United States of America with serial number of 35713. The aircraft was registered as PK-LFK and had valid Certificate of Airworthiness (C of A) and Certificate of Registration (C of R).

The total hour of the aircraft was 27,997 hours 12 minutes and 19,046 cycles. The last major check of the aircraft was C-03 check which was performed on 23 November 2017, while the aircraft had 26,997 hours and 3 minutes flight hour and 18,261 flight cycles.

The last minor check of aircraft was Phase 30 check was performed on 19 March 2018, while the aircraft had 27,895 hours and 22 minutes flight hour and 18,972 flight cycles.

The engines installed in the aircraft were CFM56-B26/3 manufactured by CFM International Company in United State of America. The left engine had serial number 658504 with the total hour of 9,351 hours 40 minutes and 7,016 cycles since new. The right engine had serial number 803662 with the total hour of 20,725 hours 15 minutes and 15,633 cycles since new.

1.3.2 Deferred Maintenance Item

The report from the previous day flight written in the Aircraft Flight & Maintenance Log (AFML) No. B1764863 as follow "during descent, cabin rate of descent hard to control".

Qon air AIRCRAFT FLIGHT & MAINTENANCE LOG

AFML SECTOR ID: B737-900 A/C TYPE: PK-LFK A/C REG: 31/03/2018 DOMMYYYY (Z): B 1764863

FLYLINE: 821 STATION: SUB SGAU (OUT) 15:25 16:45 (IN) 01:20 15:35 16:40 (OFF) (ON) FLIGHT TIME: 01:05 01:01 22 (M) - 1 -

FLIGHT CREW DETAILS: LAST NAME, EMP NR #, DTY CODE, DEPARTURE FUEL (KG), FUEL UPLIFT DATA, TOTAL FUEL ONBOARD (KG), ACTUAL FUEL ARRIVAL (KG)

DISCREPANCIES / MALFUNCTION: **During descent, cabin rate of descent hard to control.**

CORRECTIVE ACTION: **REF TO AIM 21-31 700A 801 REV.05 PERFORMED BITE TEST VIA CABIN PRESSURISE CONTROLLER UNIT 1 & NO.12 FOUND LEAK CPC NO.12 PARK. REF TO M2 21-14 (02) ADVISE TO DMI NO. 02276. WAITING SHERIFF. ATA: 21-31-00 DMI NO. 02276**

RETURN TO SERVICE: **REF 96 B737-05-117-02-01-V11. PERFORMED VISUAL INSPECTION CHECK AND FOUND OK. VISUAL CHECK RESULT GOOD. ATA: 05-00-00 DMI NO. -**

DEP ACCEPTANCE: BY PIC SIGN & AFPL NO. STA: SUB DATE: 31/03/18 TIME: 14:18

MAINTENANCE RELEASE: SIGN / STAMP

Figure 2: The AFML on the previous day

The engineer performed bite test on Cabin Pressure Controller (CPC) number 1 and CPC number 2, the result of bite test found that LRU (Line Replacement Unit) of CPC number 1 failed. It was written in the AFML that the LRU CPC number 2 failed.

The engineer requested to Maintenance Control Center for a serviceable CPC to replace the fail CPC and was informed that the serviceable CPC was not available.

The engineer reviewed and discussed the situation with chief of the shift and advised to issue the hold item into Deferred Maintenance Item (DMI), refer to B737 Series Minimum Equipment List (MEL) Chapter 21-14(3). The engineer issued a DMI No. 022796.

No.: 022796

Lionair		DEFERRED MAINTENANCE ITEM				
A/C REG: <i>PK-LPI</i>	MLB PAGE: <i>B1764 B63</i>	DATE: <i>31/05/2018</i>	ISSUED BY: [REDACTED]			
SN: <i>55713</i>	ATA CHAP: <i>21</i>	STA: <i>CEIK</i>	SIGN & STAMP			
DISCREPANCY						
<i>DURING DESCENT, CABIN RATE OF DESCENT HARD TO CONTROL</i>						
REASON FOR DEFERRAL						
<i>WAITING SPARE</i>						
QTY	PART NO.	FIG. ITEM	DESCRIPTION	QTY AV	ORDER NUMBER	STOCK ROOM
<i>1 EA.</i>	<i>21935-01AD</i>		<i>CPC</i>			
DEFERRAL CATEGORIES:						
<input type="checkbox"/> MEL/CDL Item - non flight crew/maint. action		<input checked="" type="checkbox"/> MEL/CDL Item - maint. action required		<input type="checkbox"/> Non-Airworthiness Item		
<input type="checkbox"/> MEL/CDL Item - placarding required		<input checked="" type="checkbox"/> MEL/CDL Item - flight crew action required				
REFERENCE MANUAL						
<i>MEL 21-14 (3)</i>						
Category: <i>"C"</i>		Placarding instructions provided?		<input type="checkbox"/> Yes <input type="checkbox"/> No		
ACTION TAKEN						
ENGINEER						
REMOVED:		INSTALLED:		STA	DATE	
PN:	SN:	PN:	SN:			
SIGN & STAMP						
WHITE: REMAINS IN LOG PINK: MCC YELLOW: MATERIAL BLUE: QA GREEN: REMOVED WHEN ACTIONED COMPLETED BY ENGINEER AND ROUTE TO MCC						
Form No: LA-TF-03-01			PLEASE MARK APPLICABLE STATEMENT			REV. 01

Figure 3: The DMI issued for fail CPC

1.4 Flight Recorders

The aircraft was fitted with Flight Data Recorder (FDR) and Cockpit Voice Recorder (CVR). The flight recorders were transported to KNKT recorder facility for data downloading process.

The FDR was a Honeywell solid state recorder with part number of 980-4700-042 and serial number of SSFDR-14031. The FDR has been successfully downloaded and contained 1,201 parameters of approximately 26.43 hours of aircraft operation, which contained 18 flights including the occurrence flight.

The CVR was a Honeywell solid state recorder with part number of 980-6022-001 and serial number of CVR120-13372. The CVR data has been successfully downloaded and contained 121 minutes of good quality recording data including the occurrence flight.

The relevant and significant data from the recorders will be included in the final report.

1.5 Organizational and Management Information

1.5.1 Aircraft Operator

Aircraft Owner : Next Generation Aircraft Finance 3 S.A.R.L
Luxemburg

Aircraft Operator : PT. Lion Mentari Airlines, Indonesia
(Lion Air)

Address : Jl. Gajah Mada No. 7, Jakarta Pusat, Indonesia

AOC Number : AOC 121-010

Lion Air operated total of 116 aircrafts consisting of 3 Airbus A330, 35 Boeing 737 - 800, 70 Boeing 737-900ER, and 8 Boeing 737 MAX, which served more than 120 destinations, domestic and international, and operated up to 630 flights daily.

1.5.2 Aircraft Operator Manuals

The requirement to dispatch in according to Minimum Equipment List (MEL) of Boeing 737 Series related to dispatch with single CPC as stated on chapter 21-14.3) as follow:


		B737 SERIES MINIMUM EQUIPMENT LIST			
		Rev	Date	Page No.	Master MEL Rev.
		19	3 Apr 2017	21 : 8	59
		21	AIRCONDITIONING		
Number Required for Dispatch			Maintenance Procedure Required		
Number of Installed			Operation Procedure Required		
Repair Category			Remarks or Exceptions		
Sequence Number and System					
			not exceed 103 degrees F (39 degrees C).		
21-14.	Cabin Pressure Control System				
	1) Analog Control System Automatic/ Standby Modes (300/-400)	C	2	1	O One may be inoperative provided manual mode (AC and DC actuators) operates normally.
	2) Analog Control System Automatic / Standby / Manual Modes (-300/-400)	C	3	0	M O May be inoperative for unpressurized flight provided: a) Outflow valve is deactivated open or removed, and b) Extended overwater flight is prohibited.
	3) Digital Control System Automatic Modes	C	2	1	M O One may be inoperative provided: a) Manual mode operates normally, and b) Inoperative controller is deactivated, and c) For airplane with auxiliary fuel bleed air pressurization system installed is verified to be operational before each departure, if the auxiliary fuel tank system is required for flight.

Figure 4: The related part of Boeing 737 MEL

The maintenance and operation action as required by Boeing 737 Series MEL for dispatch with single CPC as stated in Dispatch Deviation Guide (DDG) on chapter 21-14-03 as follow:


	BOEING 737 SERIES MINIMUM EQUIPMENT LIST Dispatch Deviations Guide			
	Rev.	Date	Page	Master DDG Revision
	6	17 Aug 2008	21 : 23	47
21	AIR CONDITIONING			
21 – 14 – 03	<p>Digital Control System Automatic Modes Boeing -800 / -900</p> <p>NOTE: Some DCPCS faults indicated by an AUTO FAIL Light are recoverable. Momentarily reposition the Pressurization Mode Selector to MAN and then back to AUTO. If the AUTO FAIL light remains extinguished with the Pressurization Mode Selector in AUTO, the fault has been corrected and the controller is operating normally.</p> <p>MAINTENANCE (M) Model 737-700IGW/-800 airplanes modified with the PATS BBJ auxiliary fuel tank installation are not a Boeing configuration. Therefore, procedures applicable to the auxiliary fuel bleed air pressurization system are not provided.</p> <p>For – 800 / – 900: Deactivate the inoperative cabin pressure controller (AMM 21-00-00/901):</p> <ol style="list-style-type: none"> Open and collar the associated P6-4 panel circuit breaker PRESSURIZATION CONTROL-AUTO 1 or AUTO 2. <p>OPERATIONS (O)</p> <ol style="list-style-type: none"> Normal operation of manual mode may be confirmed as follows: <ol style="list-style-type: none"> Position the Pressurization Mode Selector to MAN. Use the VALVE toggle switch to observe that the outflow valve position indicator moves to full open, to full closed and then back to full open. Position the Pressurization Mode Selector to ALTN prior to dispatch. <p>NOTE: Subsequent illumination of the AUTO FAIL light during flight requires positioning the Pressurization Mode Selector to MAN for manual mode operation.</p>			

Figure 5: DDG Chapter 21-14-03

The Boeing 737 Quick Reference Handbook (QRH) chapter Non-Normal Checklist related to the procedure for cabin altitude warning as stated on section 2.1 as follow:

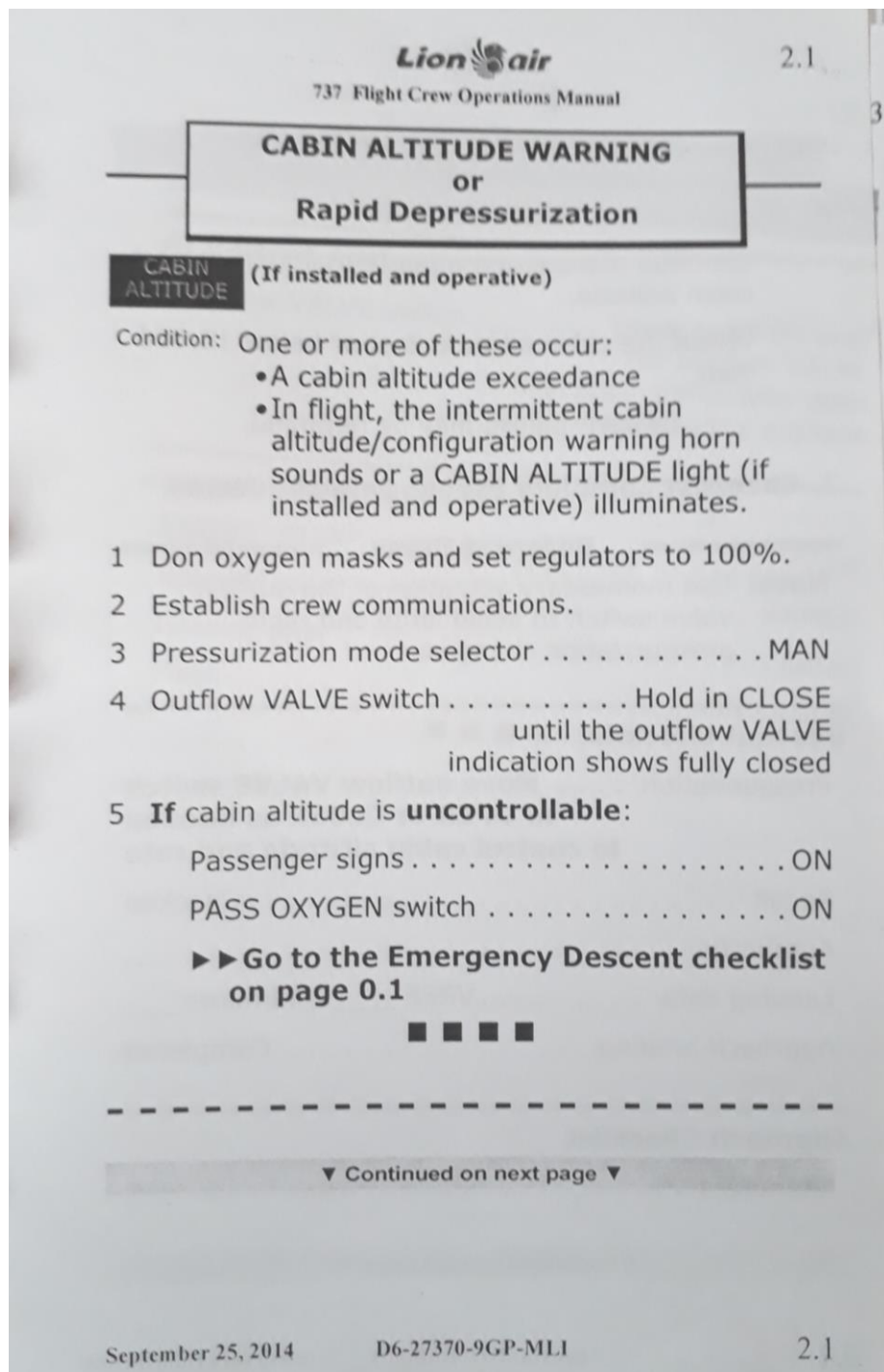


Figure 6: QRH Non-Normal Checklist Chapter 2.1

▼ CABIN ALTITUDE WARNING or Rapid Depressurization continued ▼

6 If cabin altitude is **controllable**:

Continue manual operation to maintain correct cabin altitude.

When the cabin altitude is at or below 10,000 feet:

Oxygen masks may be removed.

7 Checklist Complete Except Deferred Items

Deferred Items

Note: Use momentary actuation of the outflow valve switch to avoid large and rapid pressurization changes.

Descent Checklist

- Pressurization **Move outflow VALVE switch to OPEN or CLOSE as needed to control cabin altitude and rate**
- Recall Checked
- Autobrake _____
- Landing data VREF _____, Minimums _____
- Approach briefing Completed

Approach Checklist

- Altimeters _____

▼ Continued on next page ▼

Figure 7: QRH Non-Normal Checklist Chapter 2.2

▼ CABIN ALTITUDE WARNING or Rapid Depressurization ... continued ▼

At Pattern Altitude

Outflow VALVE switch Move to OPEN until the outflow VALVE indication shows fully open to depressurize the airplane

Landing Checklist

ENGINE START switches CONT
Speedbrake ARMED
Landing gear Down
Flaps _____, Green light



Figure 8: QRH Non-Normal Checklist Chapter 2.3

1.6 Additional Information

The investigation is continuing and *Komite Nasional Keselamatan Transportasi* (KNKT) plans to complete the investigation within 12 months since the day of the occurrence. Should any further relevant safety issues emerge during the course of the investigation, KNKT will immediately bring the issues to the attention of the relevant parties and publish as required.

1.7 Useful or Effective Investigation Techniques

The investigation was conducted in accordance with the *Komite Nasional Keselamatan Transportasi* (KNKT) approved policies and procedures, and in accordance with the standards and recommended practices of Annex 13 to the Chicago Convention.

2 FINDINGS⁴

According to factual information during the investigation, the *Komite Nasional Keselamatan Transportasi* (KNKT) identified findings as follows:

1. The aircraft had valid Certificate of Airworthiness (C of A) and Certificate of Registration (C of R).
2. The pilots held valid licenses and medical certificates.
3. The AFML book recorded a problem from the previous day flight, that during descent, cabin rate of descent difficult to control. The engineer was unable to be solved the problem and issued DMI. The aircraft departed with single CPC operated.
4. During preflight check, the pilots were conducting operation action listed in the DDG. The DDG required the pilot to position the Pressure Mode Selector to ALTN prior to dispatch.
5. During aircraft climbing passing altitude 8,000 feet, the pilot noticed the cabin vertical speed climbed excessively and the cabin pressure control selector was in manual position. Thereafter, the pilot manually selected the outflow valve selector switch to open.
6. When aircraft passing altitude about 10,000 ft, the aircraft cabin altitude aural warning activated and the cabin altitude warning light illuminated. The pilot decided to maintain altitude at 10,000 ft for a while. The pilot pressed the ALT HORN CUTOFF button and cabin altitude aural warning stopped.
7. During climbing to altitude 18,000 ft, the passenger oxygen masks dropped and the pilot decided to divert the flight to Palembang.
8. During descent, the pilot unable to control cabin pressurization and activated the outflow valve selector to open and close position.
9. The aircraft landed at Palembang and taxi normally to parking stand. After parked, the pilots noticed that cabin differential pressure shown 5.8 psi. The PIC instructed to flight attendant to hold the door open process.
10. The pilot discussed with ground engineer and was suggested to manually open the outflow valve. The pilot manually selected the out-flow valve to open position, thereafter the cabin altitude and differential pressure indicated zero.

⁴ Findings are statements of all significant conditions, events or circumstances in the accident sequence. The findings are significant steps in the accident sequence, but they are not always causal, or indicate deficiencies. Some findings point out the conditions that pre-existed the accident sequence, but they are usually essential to the understanding of the occurrence, usually in chronological order.

3 SAFETY ACTION

Prior to issuing this preliminary report, the *Komite Nasional Keselamatan Transportasi* had been informed of safety actions taken by Lion Air resulting from this occurrence.

The Safety and Security Directorate of Lion Air published Safety Notice No. 04/SS/SN/IV/2018 at 4 April 2018 with subject "*Precaution for Pressurization System Failure*", which contain notices as follow:

A. Flight Crews

- 1) to review, understand and elevate basic principal of aircraft pressurization system as described on Flight Crew Operating Manual (FCOM);
- 2) to review Unscheduled Pressurization Change as described on Non-Normal Checklist (NNC), close monitor cabin rate of climb indicator, and ensure the cabin rate indicator pointed down particularly on transition from cruise to descent phase;
- 3) if one of Auto Mode option is not available prior to flight, review and understand Deferred Maintenance Item (DMI) – Minimum Equipment List (MEL). Manual Mode Operation must be reviewed as described on FCOM Supplementary Procedure. However, the remaining Auto Mode option must be used. If in doubt, consult with chief pilot.

B. Engineers

- 1) to follow step by step task card as described on Aircraft Maintenance Manual (AMM), during rectification system failure;
- 2) to increase safety awareness of risk and potential consequence of aircraft pressurization failure during flight such as emergency descent.

4 SAFETY RECOMMENDATIONS

Komite Nasional Keselamatan Transportasi (KNKT) acknowledged the safety actions taken by the aircraft operators however, there still remain safety issues that need to be considered. Therefore, the KNKT issues the following safety recommendations addressed to Lion Air.

The DDG requirement for dispatch with single CPC operated is the Pressure Mode Selector in ALTN (alternate) position. During climb, the pilot noticed that cabin Pressure Mode Selector was in manual position. Thereafter, the pilot manually regulated the outflow valve to control cabin pressure along the flight. After the aircraft parking, the cabin differential pressure indicated 5.8 psi and the passenger door could not to be opened.

Therefore, the KNKT recommend to:

- **04.O-2018-09.1**

Improve the pilot training to ensure pilot understanding to the aircraft system and performs procedure properly.

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