KOMITE NASIONAL KESELAMATAN TRANSPORTASI
REPUBLIC OF INDONESIA

PRELIMINARY

KNKT.17.03.09.04

Aircraft Serious Incident Investigation Report

PT. Pelita Air Service

ATR 72-212; PK-PAV

Halim Perdanakusuma International Airport, Jakarta

Republic of Indonesia

19 March 2017

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2017

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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TABLE OF CONTENTS

TABLE OF FIGURES

ABBREVIATIONS AND DEFINITIONS

AAL	:	Above Aerodrome Elevation
AGL	:	Above Ground Level
AIP	:	Aeronautical Information Publication
AOC	:	Aircraft Operator Certificate
ATC	:	Air Traffic Control
ATIS	:	Automatic Terminal Information Service
ATPL	:	Airline Transport Pilot License
ATS	:	Air Traffic Services
BMKG	:	*Badan Meteorologi Klimatologi dan Geofisika* (Bureau of Meteorology, Climatology and Geophysics)
C of A	:	Certificate of Airworthiness
C of R	:	Certificate of Registration
CPL	:	Commercial Pilot License
CVR	:	Cockpit Voice Recorder
EGPWS	:	Enhanced Ground Proximity Warning System
FCTM	:	Flight Crew Training Manual
FDR	:	Flight Data Recorder
ILS	:	Instrument Landing System
IMC	:	Instrument Meteorological Condition
Km	:	Kilometers
KNKT	:	*Komite Nasional Keselamatan Transportasi* (National Transportation Safety Committee)
mbs	:	Millibars
PF	:	Pilot Flying
PIC	:	Pilot in Command
PM	:	Pilot Monitoring
QRH	:	Quick Reference Handbook
RFFS	:	Rescue and Fire Fighting Service
RNAV	:	Area Navigation approach is an approach procedure utilized both ground-based and satellite-based systems.
SSCVR	:	Solid State Cockpit Voice Recorder
SSFDR	:	Solid State Flight Data Recorder
UTC	:	Universal Time Coordinated
VMC	:	Visual Meteorological Condition

SYNOPSIS

An ATR 72-212A aircraft registered PK-PAV was being operated by PT. Pelita Air Service on 19 March 2017 as a schedule charter flight from Tunggul Wulung Airport (WICP/CXP), Cilacap, Central Java to Halim Perdanakusuma International Airport (HLP/WIHH), Jakarta. On board the aircraft were two pilots, two flight attendants and 22 passengers. There was no report or record of aircraft system malfunction prior to the occurrence.

The aircraft departed Cilacap at 1313 LT (0613 UTC). The Pilot in Command (PIC) acted as Pilot Flying (PF) and the Second in Command (SIC) acted as Pilot Monitoring (PM). The flight from departure until commencing for landing approach was uneventful. The occurrence flight was at daylight condition.

At 0752 UTC, the pilot established communication with air traffic controller of Halim Tower unit (Halim tower) and informed that the aircraft was descending to 2,500 feet at the position of 10 Nm to AL NDB. The Halim Tower issued clearance to the pilot to perform Instrument Landing System (ILS) approach and to report when established on localizer.

At 0758 UTC, the pilot reported passing altitude 1,500 feet and the Halim tower informed that the wind speed was 4 knots from 270º and issued landing clearance.

At aircraft altitude approximately 500 feet, the autopilot disengaged and the pilot flew manually. At approximately 200 feet above ground level (AGL), the flight data recorder (FDR) recorded the yaw damper OFF.

The approach continued and when over the runway after Enhanced Ground Proximity Warning System (EGPWS) callout "TEN", the Cockpit Voice Recorder (CVR) recorded the PM called "speed check".

At 0801 UTC, the aircraft touched down 14 seconds after the EGPWS callout "TEN".

The Halim Tower controller noticed that the aircraft touched down near the intersection taxiway G at approximately 800 meters from the runway threshold and bounced. The aircraft stopped on runway near the intersection taxiway A. No one injured as the result of this occurrence.

The aircraft damaged found on the nosewheel. Booth of nose wheel tires blown out and nose wheel hubs scraped by the runway and the nosewheel axle bent. During inspection found cracked on the engine mounting strut bar and shock damper of engine number 1 and number 2.

The investigation is continuing and will include details of the following information; description of the flight recorders, related procedures of the operators, human factors issue, flight technique and aircraft system.

Following this accident PT. Pelita Air Service issued safety actions which considered relevant to improve safety. In addition, Komite Nasional Keselamatan Transportasi (KNKT) issues safety recommendations to PT. Pelita Air Service related to monitoring system in order to monitor the implementation of the procedure for stabilized approach.

1 FACTUAL INFORMATION

1.1 History of the Flight

An ATR 72-212A aircraft registered PK-PAV was being operated by PT. Pelita Air Service on 19 March 2017 as a schedule charter flight from Tunggul Wulung Airport (WICP/CXP) Cilacap[1], Central Java to Halim Perdanakusuma International Airport (WIHH/HLP) Jakarta[2]. On board the aircraft were two pilots, two flight attendants and 22 passengers. There was no report or record of aircraft system malfunction prior to the occurrence.

The aircraft departed Cilacap at 1313 LT (0613 UTC[3]). The Pilot in Command (PIC) acted as Pilot Flying (PF) and the Second in Command (SIC) acted as Pilot Monitoring (PM). The flight from departure until commencing for landing approach was uneventful. The occurrence flight was at daylight condition.

At 0752 UTC, the pilot established communication with air traffic controller of Halim Tower unit (Halim tower) and informed that the aircraft was descending to 2,500 feet at the position of 10 Nm to AL NDB[4]. The Halim Tower issued clearance to the pilot to perform Instrument Landing System (ILS) approach and to report when established on localizer.

At 0758 UTC, the pilot reported passing altitude 1,500 feet and the Halim tower informed that the wind speed was 4 knots from 270º and issued landing clearance.

At aircraft altitude approximately 500 feet, the autopilot disengaged and the pilot flew manually. At approximately 200 feet above ground level (AGL), the flight data recorder (FDR) recorded the yaw damper OFF.

The approach continued and when over the runway after Enhanced Ground Proximity Warning System (EGPWS) callout “ten”, the Cockpit Voice Recorder (CVR) recorded the PM called “speed check”.

At 0801 UTC, the aircraft touched down 14 seconds after the EGPWS callout “TEN”.

The Halim Tower controller noticed that the aircraft touched down near the intersection taxiway G at approximately 800 meters from the runway threshold and bounced. The aircraft stopped on runway near the intersection taxiway A.

At 0801 UTC, the pilot contacted the Halim tower controller informed that they required towing assistance and was acknowledged. While waiting the assistance, the Halim tower controller advised to shut down the engine. The Halim tower controller informed to the pilot that the nose landing gear was damaged and advice to disembark the passenger on the runway. The pilot contacted the company operation staff and requested vehicle to transport the passengers to the terminal building.

1 Tunggul Wulung Airport (WICP), Cilacap will be named as Cilacap for the purpose of this report.

2 Halim Perdanakusuma International Airport (WIHH), Jakarta will be named as Halim for the purposes of this report.

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

All the UTC time used in this report was based on the CVR recorded time of communication between the pilot and Air Traffic Controller.

4 AL is a NDB point which was located 8 Nm from threshold runway 24.

No one injured as the result of this occurrence

Figure 1: final aircraft position and mark on the runway

1.2 Damage to Aircraft

The aircraft was substantially damaged. The nosewheel tires blown out, both nose wheel hubs scraped by the runway and the nosewheel axle bent.

Figure 2: nose landing gear damaged

The inspection after the occurrence found cracked on the mounting strut bar and the shock mount of engine number 1 and number 2.

1.3 Other Damage

The runway surface was scratched along the aircraft movement with the depth of approximately five centimeters.

1.4 Personnel Information

1.4.1 Pilot in Command

Gender	:	Male
Age	:	55 years old
Nationality	:	Indonesia
Marital status	:	Married
Date of joining company	:	28 July 1984
License	:	ATPL
Date of issue	:	15 August 1995
Aircraft type rating	:	ATR 42/72-500
Instrument rating validity	:	31 August 2017
Medical certificate	:	First Class
Last of medical	:	28 November 2016
Validity	:	Valid until 31 May 2017
Medical limitation	:	Holder shall wear lenses that correct for distant vision and posses glasses that correct for near vision
Last line check	:	24 February 2017

Last proficiency check	:	25 February 2017
Flying experience		
Total hours	:	13,769 Hours 17 Minutes
Total on type	:	645 Hours 41 Minutes
Last 90 days	:	73 Hours 58 Minutes
Last 60 days	:	60 Hours 57 Minutes
Last 24 hours	:	7 Hours 33 Minutes
This flight	:	1 Hours 5 Minutes

1.4.2 Second in Command

Gender	:	Male
Age	:	30 years old
Nationality	:	Indonesia
Marital status	:	Single
Date of joining company	:	1 January 2013
License	:	CPL
Date of issue	:	4 January 2012
Aircraft type rating	:	ATR 42/72-500
Instrument rating validity	:	31 July 2017
Medical certificate	:	First Class
Last of medical	:	30 September 2016
Validity	:	31 March 2017
Medical limitation	:	None
Last line check	:	-
Last proficiency check	:	25 February 2017
Flying experience		
Total hours	:	1,648 Hours 28 Minutes
Total on type	:	1,403 Hours 28 Minutes
Last 90 days	:	42 Hours 9 Minutes
Last 60 days	:	30 Hours 34 Minutes
Last 24 hours	:	7 Hours 33 Minutes
This flight	:	1 Hours 5 Minutes

1.5 Aircraft Information

1.5.1 General

Registration Mark	:	PK-PAV
Manufacturer	:	ATR
Country of Manufacturer	:	France
Type/Model	:	ATR 72-212A
Serial Number	:	908
Year of Manufacture	:	2010
Certificate of Airworthiness		
Issued	:	20 January 2013
Validity	:	Valid until 19 January 2018
Category	:	Transport
Limitations	:	None
Certificate of Registration		
Number	:	3610
Issued	:	13 May 2016
Validity	:	Valid until 12 May 2019
Time Since New	:	10,659.02 Hours
Cycles Since New	:	7,262 Cycles
Last Major Check	:	C-Check (9 January 2015)
Last Minor Check	:	A-Check (7 January 2017)

1.5.2 Engines

Manufacturer	:	Pratt & Whitney Canada
Type/Model	:	PW 127M
Serial Number-1 engine	:	ED 0276
▪ Time Since New	:	10,659.02 Hours
▪ Cycles Since New	:	7,262 Cycles
Serial Number-2 engine	:	ED 0274
▪ Time Since New	:	10,659.02 Hours
▪ Cycles Since New	:	7,262 Cycles

1.6 Meteorological Information

The weather report for Halim was provided by *Badan Meteorologi Klimatologi Geofisika* – BMKG (Meteorological Climatological and Geophysics Agency).

On 19 March 2016, the weather report between 0800 until 0830 UTC were as follows:

	0800 UTC	0830 UTC
Wind	300 / 10 knots	320 / 10 knot
Visibility	7 km	7 km
Weather	Nil	Nil
Cloud	SCT 018	SCT 018
TT/TD	31 / 23	30 / 23
QNH (mb/in Hg)	1008/29.76	1009/29.79

1.7 Communications

All communications between Air Traffic Services (ATS) and the crew were recorded by ground based automatic voice recording equipment for the duration of the flight. The quality of the aircraft's recorded transmissions was good.

Relevant extracts from the transcripts of ATS recordings will be include in the final report.

1.8 Aerodrome Information

Airport name	:	Halim Perdanakusuma International Airport
Airport identification	:	WIHH / HLP
Airport operator	:	PT. Angkasa Pura II (Persero)
Airport certificate	:	008/SBU-DBU/VII/2010
Coordinate	:	06°17'03" S; 106°53'06" E
Elevation	:	84 feet
Runway direction	:	06 – 24
Runway slope	:	0.07% down to east
Runway length	:	3,000 meters (displaced 200 meters on the beginning runway 24)
Runway width	:	45 meters
Threshold runway 24	:	06° 15' 42.16" S, 106° 54' 06.48" E

The aerodrome layout as published in the Aeronautical Information Publication (AIP) Volume II Amendment 33 date 20 September 12, is as follows:

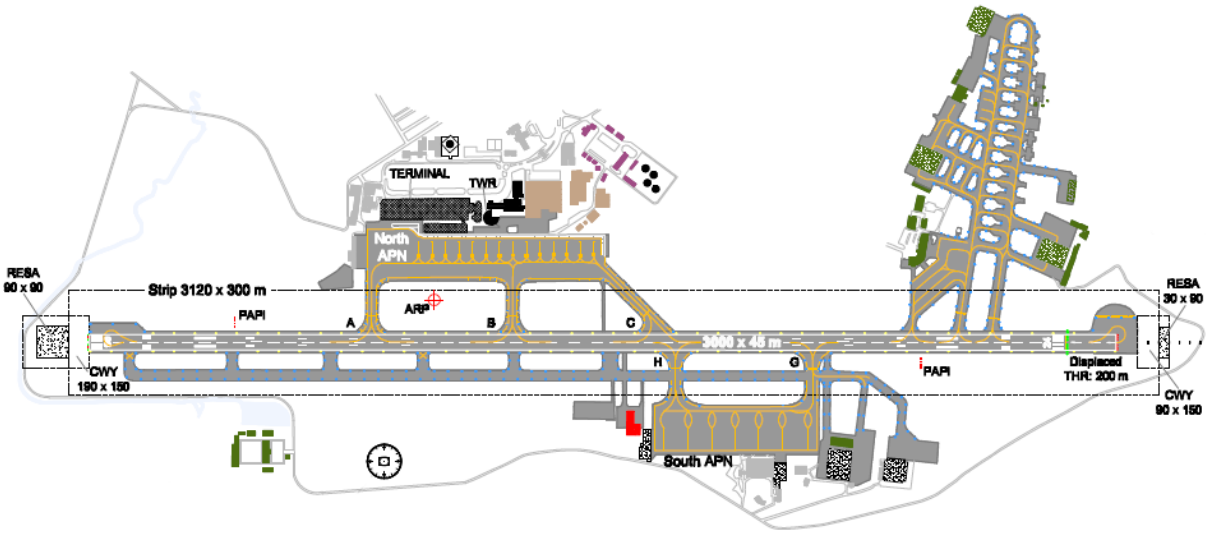

Figure 3: The Halim Perdanakusuma International Airport

1.9 Flight Recorders

1.9.1 Flight Data Recorder

The aircraft was fitted with L3-Comm Solid Stated Flight Data Recorder (SSFDR) FA-2100 model with part number 2100-4043-00 and serial number 000284431. The recorder was transported to Komite Nasional Keselamatan Transportasi (KNKT) recorder facility for data downloading process. The FDR was successfully downloaded and contain 313 parameters and approximately 137 hours of aircraft operation, which was containing 63 flights including the accident flight.

The relevant data of the FDR will be included in the final report.

1.9.2 Cockpit Voice Recorder

The aircraft was fitted with L3-Comm Solid Stated Cockpit Voice Recorder (SSCVR) FA2100 model with part number 2100-1020-02 and serial number 000542425. The recorder was transported to KNKT recorder facility for data downloading process. The CVR was successfully downloaded and contained two hours and four minutes of good quality recording data. The significant excerpts from the CVR will be included in the final report.

1.10 Wreckage and Impact Information

Several metal and tire scratch marks were found on the runway, the scratch marks found at intersection taxiway B or about 1,500 meters from runway threshold.

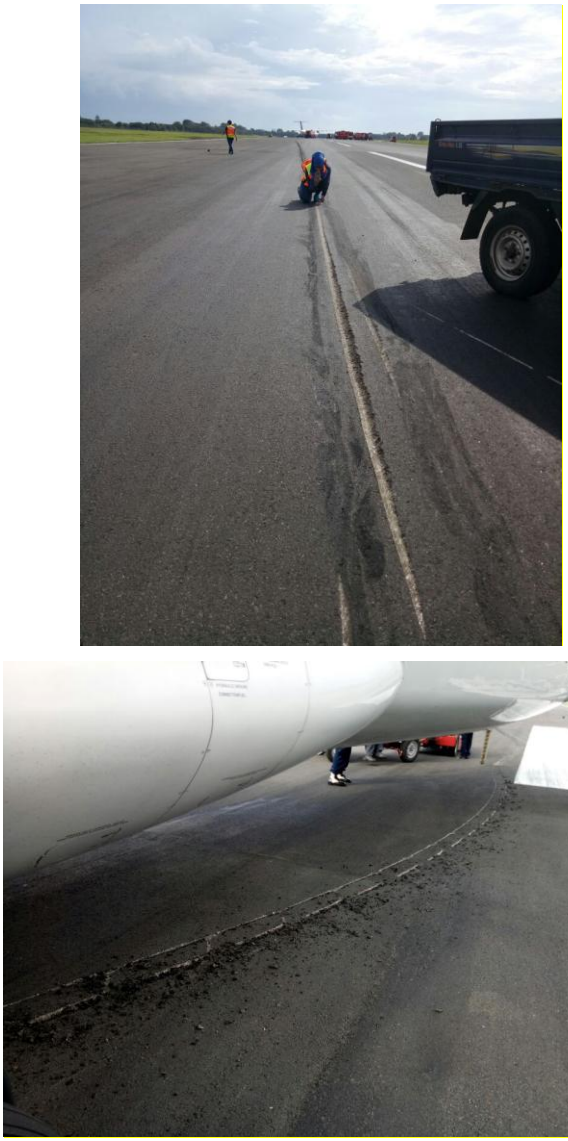

Figure 4: Scratch marks found on runway Survival Aspect

During the landing roll, the tower controller noticed that the aircraft was bounced several times before the aircraft stop at intersection taxiway A.

At 0807 UTC, the pilot advised the tower controller that the aircraft stopped on the runway and requested for assistance. The tower controller acknowledged and advised the pilot to wait for the assistance.

The tower controller then press the crash bell to notify the Recue and Fire Fighting Services (RFFS). The RFFS arrived at the accident site within two minutes after crash bell activation.

At 0808 UTC, the tower controller advised the pilot to shut down the engines since the RFFS personnel had arrived near the aircraft.

The Tower Controller advised the pilot to disembarked the passenger on the runway and then transported by bus to the passenger terminal.

Passenger disembarked completed at approximately 10 minutes after the aircraft stopped.

1.11 Organizational and Management Information

Aircraft Owner	:	NAC Aviation 19 Limited
Address	:	Fifth Floor, Belpord Place, Henry Street, Limerick Ireland.
Aircraft Operator	:	PT. Pelita Air Service
Address	:	Jl. Abdul Muis 52-56A Jakarta, Indonesia

The Pelita Air Service had a valid Aircraft Operator Certificate (AOC) number 121-008. The operator was operating 25 aircraft consist of 14 rotary wing and 11 fixed wing aircraft including one ATR 42-500 and two ATR 72-212A aircraft.

1.11.1 Flight Crew Training Manual

Flight Crew Training Manual (FCTM) chapter 02.01.09 Normal Procedure sub-chapter Stabilization Policy mentioned that the stabilization criteria were as follows:

Approaches must be stabilized:

- *1000 ft AAL in IMC conditions* (AAL – Above Aerodrome Elevation)
- *500 ft AAL in VMC conditions*
- *300 ft AAL following circle-to-land*

An approach is considered stabilized when all of the following criteria are met:

- *Lateral path (Loc, Radial or RNAV path) is tracked*
- *Landing configuration is established*
- *Energy management:*
  - *Vertical path (Glide, Altitude versus Distance or RNAV path) is tracked*
  - *Power setting is consistent with appropriate aircraft weight, Head/Tail wind component and vertical guidance requirements*
  - *Speed and pitch attitude are relevant to actual conditions*
- *Briefing and checklists are completed.*

Only small deviations are allowed if immediately called out and corrected:

- *Altitude during initial approach: ± 100 ft*
- *Lateral guidance on final approach segment: half LOC scale deviation for precision or ± 5° on radial on non precision approach*
- *Vertical path on final approach segment: half GS scale deviation or + 200/–0 ft for non precision approaches*
- *Altitude deviation at DA or MDA: 0 ft*
- *Speed +5/–0 kt*

Only small adjustments in pitch and/or heading are allowed to stay on track:

- *Maximum sink rate is 1000 ft per minute*
- *Maximum rate of descent adjustments are ±300 ft per minute from target rate*
- *Bank angles are no more than 15°*
- *Localizer guidance adjustments are done within heading bug width*
- *GS guidance adjustments must be within ±2° of pitch change*

All deviations must be called out loud by PM or PF (whoever identifies deviation first) using the following Call-outs:

"SPEED" "LOC" "GLIDE" "VERTICAL SPEED"

After immediate correction, PF must answer "CORRECTING …"

Flight events	*Situation*	*PM call outs*	*PF orders*
1000 FT AAL IMC	*STABILIZED*	*"1000 FT, STABILIZED"*	*"WE CONTINUE"*
	UNSTABILIZED	*"1000 FT, GO AROUND"*	*"GO-AROUND, SET POWER, FLAPS ONE NOTCH"*
500 FT AAL VMC	*STABILIZED*	*"500 FT, STABILIZED"*	*"WE CONTINUE"*
	UNSTABILIZED	*"500 FT, GO AROUND"*	*"GO-AROUND, SET POWER, FLAPS ONE NOTCH"*
300 FT AAL CIRCLE-TOLAND	*STABILIZED*	*"300 FT, STABILIZED"*	*"WE CONTINUE"*
	UNSTABILIZED "300 FT,	*GO AROUND"*	*"GO-AROUND, SET POWER, FLAPS ONE NOTCH"*

Refer to the Abnormal and Emergency Procedures stated on the FCTM sub-chapter 3.1.4 unusual attitude recovery state that Bounce landing results from either too much speed or too high slope, or both of them, on final approach.

To avoid bounce landing, decide to go-around if the plane is not stabilized.

The procedure to avoid bounced landing as stated in the subchapter 4.1.3 are as follows:

- *Apply an immediate go-around*
- *Never try to land*
- *Never push the control column forward*

1.12 Useful or Effective Investigation Techniques

The investigation was conducted in accordance with the KNKT approved policies and procedures, and in accordance with the standards and recommended practices of Annex 13 to the Chicago Convention.

2 FINDINGS[9]

According to factual information during the investigation, the Komite Nasional Keselamatan Transportasi identified initial findings as follows:

- The pilots held valid licenses and medical certificates.
- The aircraft had valid Certificate of Airworthiness (C of A) and Certificate of Registration (C of R).
- There was no report or record of aircraft system malfunction prior to the accident.
- The weather during landing phase reported good and visibility was 7 km.
- The aircraft touchdown 14 seconds after the EGPWS callout "TEN".
- The tower controller noticed that the aircraft was bounced then activated the crash bell then informed the Rescue and Fire Fighting Service (RFFS).
- After the RFFS personnel arrived near the aircraft to assist the evacuation, the tower controller advised the pilot to shut down the engines.
- Passenger evacuation completed at approximately 10 minutes after the aircraft stopped.
- Several metal and tire scratch marks were found on the runway, the scratch marks found at approximately 1,000 meters from runway threshold.
- FCTM sub-chapter 3.1.4 unusual attitude recovery stated that to avoid bounce landing, decide to go-around if the plane is not stabilized.

9 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

At the time of issuing this preliminary report, the Komite Nasional Keselamatan Transportasi had been informed by PT. Pelita Air Service for the issuance of safety actions resulting from this occurrence.

- On April 2017, issued the revision 5 of Continues Airworthiness Maintenance Program (CAMP) including chapter 3.15 CVR and FDR inspection with additional explanation related to standard result of read out and interval time to calibrated FDR. The detail of the revision CAMP is attached in the appendices.

4 SAFETY RECOMMENDATIONS

According to factual information and initial findings, the Komite Nasional Keselamatan Transportasi (KNKT) issued safety recommendations to address safety issues identified in this report.

4.1 PT. Pelita Air Services

- **04.O-2017-9.1**

  To establish monitoring system in order to monitor the implementation of the procedure for stabilized approach.

5 APPENDICES

5.1 Revision of Continuous Aircraft Maintenance Program

25. Fuel in the oil system
26. Oil fire in exhaust duct
27. Inter compressor case fire warning (PW124B (Pre-SB21314)
28. Propeller brake failure
29. Engine exposed to fire extinguishing agent (foam, powder, gas or other chemical extinguishers)
30. Engine related vibration and/or cracked external tubes
31. Lack of Engine Preservation
32. Ingestion of Hydraulic Fluid
33. Hydraulic Fluid in the Oil System

3.9. ATC TRANSPONDER CHECK

ATC Transponder check shall be performed within 24 calendar months in accordance with the requirement of Civil Aviation Safety Regulation (CASR) part 91.413. This check shall performed in accordance with PAS checklist

3.10. ALTIMETER CHECK

Altimeter check shall be performed within 24 calendar months as required in CASR part 91.411. This check shall perform in accordance with PAS checklist.

3.11. ELT CHECK

Functional test of the ELT is to be performed within 12 calendar months as required in CASR 91.207 Accomplishment of the ELT check should be performed in accordance with PAS checklist.

3.12. VOR CHECK

Calibration check of VOR shall be performed within the preceding 30 days, as requires is CASR part 91. 171. This check shall be performed in accordance with PAS checklist.

3.13. COMPASS COMPENSATING

Aircraft Compass swing shall be accomplished every 4 Years (MRBR Task 342811-ADJ-10000-1), or after any following condition:

a. After lighting strike
b. After replacement of any compass
c. Pilot report that the compass has been become unreliable

After compass swing has been performed on an aircraft, result of calculation shall be entered in the DGCA form KU 27.

3.14. AIRCRAFT WEIGHING

The aircraft must be weighed, if any of the following condition exists: (Ref. to CMM Ch. V)

a. If has been 36 months since the weight and balance check
b. After the aircraft completely paint striped and repainted
c. After any major repair or modification, which significantly affects the aircraft weight and CG.
d. After pilot report and unsatisfactory balance condition

After weight and balance check has performed on an aircraft, result of weigh and balance calculation shall be entered in the Pelita Air Form.

3.15. CVR AND FDR INSPECTION

Flight Data Recorder and Cockpit Voice Recorder Read out (Analysis means to determine all parameter are recorded correctly, the quality of the recorded data to determine the bit error rate is within acceptable limit, to ensure that the recording duration is running perfectly, and to determine the nature and distribution of the errors) shall be accomplished every 12 months. FDR should be calibrated in every 5 YR Ref to CASR 91 appendix E, CVR and FDR operational test every Pre - Flight check. FDR Mandatory parameter to be recorded refer to ATR72 212A AMM JIC 313131 – OPT – 10010.

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