



**KOMITE NASIONAL KESELAMATAN TRANSPORTASI
REPUBLIC OF INDONESIA**

FINAL

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Aircraft Serious Incident Investigation Report

Lombok Institute of Flight Technology

Liberty XL2; PK-LLA

Selaparang Airport, Lombok

Republic of Indonesia

29 May 2015

2020

This Final Report was published 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 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).

This short summary investigation report does not contain analysis and only highlights safety message as lesson learnt to improve aviation safety.

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Jakarta, 10 July 2020

**KOMITE NASIONAL
KESELAMATAN TRANSPORTASI
CHAIRMAN**



SOERJANTO TJAHJONO

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ABBREVIATIONS AND DEFINITIONS

ARFF	:	Aircraft Rescue and Fire Fighting
KNKT	:	<i>Komite Nasional Keselamatan Transportasi</i> /National Transportation Safety Committee
LIFT	:	Lombok Institute of Flight Technology
LT	:	Local Time
SMS	:	Safety Management System
UTC	:	Universal Time Coordinated

1 FACTUAL INFORMATION

1.1 History of the Flight

On 29 May 2015, a liberty XL2 aircraft registered PK-LLA was being operated by Lombok Institute of Flight Technology (LIFT) on solo touch-and-go circuit exercises¹ at Selaparang Airport, Lombok² (WADA) and the student pilot was the only person on board the aircraft.

Prior the flight, the student pilot was briefed by another student pilot who used the PK-LLA aircraft. The other student pilot advised experiencing hard landing however, the aircraft condition appeared remain normal. The other student pilot did not consider that the hard landing was occurrence that need to be reported. The student pilot then conducted preflight check of the aircraft condition and considered that the aircraft condition was normal included the nose landing gear.

About 1500 LT (0700 UTC³), the aircraft departed runway 27 of Lombok with the fuel onboard sufficient for three hours flight time, the departure process until the third touch and go exercise was uneventful. During landing approach of the fourth touch and go, the student pilot used flaps 20° with speed about 75 knots. The aircraft touched down and continued rolling with the flaps still on 20°. When the speed was about 40 knots, the student pilot felt the nose wheel impacted a patched-runway and bounced. The aircraft then touched down harder than usual, to recover the bounce, the student pilot increased the engine power and continued to go around.

At 0740 UTC, the air traffic controller (controller) received information from aviation security officer that there was a detached nose wheel on the runway. After knowing that the detached nose wheel was from PK-LLA aircraft, the controller informed the situation to the student pilot and instructed to make holding on left downwind runway 27. The controller also coordinated with other related units including Aircraft Rescue and Fire Fighting (ARFF) and LIFT representative.

At 0750 UTC, chief flight instructor of LIFT (flight instructor) came to tower and communicated with the student pilot to calm down the student pilot. The flight instructor instructed to perform a slow flight with flap 30° to minimized the aircraft speed and to perform low pass over runway 27 for landing gear observation. The student pilot performed low pass flying four times over runway 27.

Since the wind direction was from 090° until 120° with velocity of 8 to 10 knots, the flight instructor advised the controller to change the runway in use to runway 09 and was approved. The flight instructor then instructed the student pilot to exercise a low pass on runway 09. The student pilot performed low pass three times over runway 09. The flight instructor briefed the student pilot of how to make landing approach in such condition and advised to switch off ignition, master switch, and fuel selector after landing.

1 A touch-and-go is a practice landing whereby the aircraft is permitted to touch the runway briefly, without braking before taking off again.

2 Selaparang Airport, Lombok will be named as Lombok for the purpose 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 occurred. Local time in Lombok is UTC+8 hours.

At 0800 UTC, the ARFF personnel sprayed foam on the runway along 1 kilometer started from intersection taxiway “B” until taxiway “C”. About 15 minutes later, the ARFF unit including ambulance from the airport was standing by on taxiway “B”.

At 0912 UTC, the aircraft landed on runway 09, slightly veered to the right then stopped on the runway.

There was no injury and no other damage to property and/or the environment in this occurrence.

1.2 Damage to Aircraft

The aircraft was substantially damaged as the result of the occurrence, and the damage were as follows:

- propeller blades bent;
- lower skin scratch;
- lower tail section scratch;
- left flap dent.



Figure 1: The aircraft was substantially damaged

1.3 Wreckage and Impact Information

During the fourth touch-and-go, the nose wheel detached. The following figure showed the location of the broken nose landing gear (square red-dotted line) used other Liberty XL-2 aircraft.



Figure 2: The location of collapsed strut using other aircraft

The aircraft landed runway 09 and veered to the right then stopped approximately 1,099 meters from beginning runway 09. The collapsed nose landing gear strut impacted with the runway surface and created scratch mark on the runway.

1.4 Tests and Research

The examination of the nose landing gear assembly was performed by KNKT investigator in the LIFT facilities. The observation of the fracture surface indicated low cycle fatigue. This type of failure occurred due to excessive force. The observation of the fracture surface indicated that the nose landing gear collapsed due to excessive impact forces.



Figure 3: The collapsed nose landing gear strut (left) and its collapsed surface (right)

2 SAFETY ACTION

At the time of issuing this report, the Komite Nasional Keselamatan Transportasi had been informed of any safety actions taken by the Directorate General Civil Aviation (DGCA) as follows:

On 15 August 2018, conducted Safety Awareness meeting which invited all aircraft operator in Indonesia included flight school. One of the meeting agenda encouraged the aircraft operator to implement the requirement standard to prevent incident or accident.

3 SAFETY MESSAGES

Prior to the flight, the student pilot had been advised by another student pilot who used the PK-LLA aircraft that he experienced hard landing. The other student pilot did not consider that the hard landing was occurrence that need to be reported as the aircraft condition appeared remain normal. After that, the student pilot conducted preflight check and did not found any abnormality on the aircraft included the nose landing gear. The examination of the nose landing gear assembly conducted by the KNKT after the accident indicated that the nose landing gear strut collapsed due to excessive impact force.

This occurrence highlighted the excessive impact force that can affect nose landing gear strength.

During period of 2011 until 2017, the KNKT investigated four occurrences of abnormal runway contact involving flying school which resulted in the nose landing gear damaged. All of the occurrences highlighted safety issues of inappropriate landing technique. The investigation report can be found in the following link:

- KNKT investigation number KNKT.11.03.08.04 involved Cessna 172 aircraft on 7 March 2011
http://knkt.dephub.go.id/knkt/ntsc_aviation/baru/Final%20Report%20PK-HAF.pdf
- KNKT investigation number KNKT.11.03.08.04 involved Cessna 172 aircraft on 7 March 2011
http://knkt.dephub.go.id/knkt/ntsc_aviation/baru/2014%20-%200003%20-%20PK-BOB%20Final%20Report.pdf
- KNKT investigation number KNKT.17.01.02.04 involved Cessna 172 aircraft on 16 January 2017
http://knkt.dephub.go.id/knkt/ntsc_aviation/baru/2017%20-%20002%20-%20PK-MUA%20FINAL%20Report.pdf
- KNKT investigation number KNKT.17.01.05.04 involved PA-28 aircraft on 24 January 2017
http://knkt.dephub.go.id/knkt/ntsc_aviation/baru/2017%20-%200005%20-%20PK-PBO%20FINAL%20Short%20Summary%20Report.pdf

A pilot report after experiencing a hard landing may trigger aircraft engineer to inspect the aircraft landing gear strut. Crack on the nose landing gear strut can be detected by thorough inspection conducted by aircraft engineer.

The Civil Aviation Safety Regulation (CASR) part 91 subchapter 91.527 described duties for pilot in command, included requirement to report of all known or suspected defect in the aircraft to the operator at the termination of the flight. Pilot also can voluntarily report an actual or potential hazard which can affect the safety of aircraft operation, as required in the CASR Part 19 subchapter 19.59.

The full requirement of CASR part 19 and part 91 can be found in the following link:
https://imsis-djpu.dephub.go.id/Regulation_.php?Regulation=VGtFOVBRPT0=