

PRELIMINARY
KNKT.16.05.14.04

**KOMITE
NASIONAL
KESELAMATAN
TRANSPORTASI**

Aircraft Serious Incident Investigation Report

**Hong Kong Airlines
Airbus 330-223; B-LNE
Near Banjarmasin
Republic of Indonesia
6 May 2016**



**KOMITE NASIONAL KESELAMATAN TRANSPORTASI
REPUBLIC OF INDONESIA
2016**

This Preliminary 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.

Readers are advised that the KNKT investigates for the sole purpose of enhancing aviation safety. Consequently, the KNKT reports are confined to matters of safety significance and may be misleading if used for any other purpose.

As the KNKT believes that safety information is of greatest value if it is passed on for the use of others, readers are encouraged to copy or reprint for further distribution, acknowledging the KNKT as the source.

When the KNKT makes recommendations as a result of its investigations or research, safety is its primary consideration.

However, the KNKT fully recognizes that the implementation of recommendations arising from its investigations will in some cases incur a cost to the industry.

Readers should note that the information in KNKT reports and recommendations is provided to promote aviation safety. In no case is it intended to imply blame or liability.

TABLE OF CONTENTS

TABLE OF CONTENTS	i
TABLE OF FIGURES	iii
ABBREVIATIONS AND DEFINITIONS	iv
INTRODUCTION	v
1 FACTUAL INFORMATION	1
1.1 History of the Flight.....	1
1.2 Injuries to Persons.....	4
1.3 Damage to Aircraft	4
1.4 Other Damage	5
1.5 Personnel Information	5
1.5.1 Pilot in Command.....	5
1.5.2 Second in Command	5
1.5.3 Flight Attendants	6
1.6 Aircraft Information.....	6
1.6.1 General	6
1.6.2 Engines	7
1.6.3 Weather Radar System	7
1.7 Meteorological Information.....	7
1.8 Aids to Navigation.....	9
1.9 Communications.....	9
1.10 Aerodrome Information	9
1.11 Flight Recorders.....	10
1.11.1 Flight Data Recorder	10
1.11.2 Cockpit Voice Recorder	11
1.12 Wreckage and Impact Information	13
1.13 Medical and Pathological Information	14
1.14 Fire.....	14
1.15 Survival Aspects	14
1.16 Tests and Research	15
1.17 Organizational and Management Information.....	15
1.18 Additional Information	15
1.19 Useful or Effective Investigation Techniques	15

2	FINDINGS.....	16
3	SAFETY ACTION	18
4	SAFETY RECOMMENDATIONS	19
5	APPENDICES.....	20
5.1	Cabin Crew Notice	20

TABLE OF FIGURES

Figure 1: The B-LNE aircraft after the occurrence	1
Figure 2: The flight plan route (M522)	2
Figure 2: Several cracks on passenger service units.....	4
Figure 4: Clouds type satellite imagery on occurrence area (blue circle)	8
Figure 4: Prognosis chart FL250-630 valid for 6 May 2016 at 1800 UTC.....	8
Figure 6: FL390 wind/temperature chart for 6 May 2016 at 1800 UTC.....	9
Figure 8: The significant FDR parameters	10
Figure 10: Aircraft flight track based on FDR data.....	11
Figure 9: The aft galley condition a few minute after turbulence	14
Figure 10: Damage (red) and injury (blue) distribution	14

ABBREVIATIONS AND DEFINITIONS

ACARS	:	Aircraft Communications Addressing and Reporting System
ACC	:	Area Control Centre unit
ADC	:	Aerodrome Control Tower
AED	:	Automated External Defibrillator
AP	:	Autopilot
APP	:	Approach Control unit
ARFF	:	Aircraft Rescue and Fire Fighting
ATPL	:	Airline Transport Pilot License
CCN	:	Cabin Crew Notice
CPL	:	Commercial Pilot License
CVR	:	Cockpit Voice Recorder
FDR	:	Flight Data Recorder
FL	:	Flight Level
ft	:	Feet
G	:	Gravitational Force
IOCC	:	Integrated Operations Control Center
Km	:	Kilometer
KNKT	:	Komite Nasional Keselamatan Transportasi / National Transportation Safety Committee
PF	:	Pilot Flying
PIC	:	Pilot in Command
PM	:	Pilot Monitoring
RTB	:	Return to Base
SIC	:	Second in Command
SP	:	Senior Purser
UTC	:	Universal Time Coordinated
VHF	:	Very High Frequency

INTRODUCTION

SYNOPSIS

This preliminary report is based on initial factual data gathered from recorders, observation in the aircraft cabin interior, interview with the entire crew a day after the occurrence and examined the aircraft operator safety actions.

On 6 May 2016, an Airbus A330-223 aircraft registered B-LNE was being operated by Hong Kong Airlines as passenger scheduled flight from I Gusti Ngurah Rai International Airport (WADD), Bali, Indonesia departed at 1749 UTC with intended destination to Hong Kong International Airport (VHHH) Hong Kong with flight number CRK6704. On board in this flight was with 216 occupants, consisted of two pilots, ten flight attendants and 204 passengers.

During the pre-flight, the pilots concerned to the weather chart which depicted significant clouds surround the planned route over Kalimantan Island. Respecting to the weather, the pilot requested additional fuel onboard for the weather diversion and also advised flight attendants that the flight would encounter turbulence in one hour after departure and make sure that the passengers secured the seatbelt when the seatbelt sign on.

The pilot noticed on the weather radar a clear path between build up cells on the right direction of the flight and the distance between build up cells was approximately 40 Nm. Thereafter the aircraft was turned to the right toward the clear path.

While flying in Flight Level (FL) 410 with seatbelt sign on, the pilot elected to fly on a clear path between build up cells. In the middle of the buildup cells, the pilots started to see a magenta color displayed on the radar and this was about 5 Nm ahead, the pilot decided to fly straight as buildup cells were on the left and right of the aircraft track.

At 1834 UTC, the flight encountered severe turbulence for about 2 minutes. The autopilot disengaged and the pilot flew the aircraft manually for about 6 minutes.

Three flight attendants and 11 passengers injured. After assessed the situation of the injured occupants, the PIC decided to return to Bali.

At 2029 UTC, the aircraft landed safely and parked on parking stand number 19.

All injuries occupants were taken to the airport health facility by ambulances then transferred to the nearest hospital for further medical treatment.

The aircraft had cracks on the aft galley ceiling and several passenger service units.

At the time of issuing this preliminary report, the Komite Nasional Keselamatan Transportasi (KNKT) had been informed of safety actions resulting from this occurrence. KNKT considered that the safety actions issued by the aircraft operator were relevant to improve safety and consider not issuing safety recommendation in this preliminary report.

The investigation is continuing and will include details but not limited to the meteorological information and detection system.

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 6 May 2016, an Airbus A330-223 aircraft registered B-LNE was being operated by Hong Kong Airlines as passenger scheduled flight from I Gusti Ngurah Rai International Airport (WADD), Bali, Indonesia¹ to Hong Kong International Airport (VHHH) Hong Kong² with flight number CRK6704.



Figure 1: The B-LNE aircraft after the occurrence

During preflight prior to departure from Bali, the pilots concerned to the weather chart which depicted significant clouds surround the planned route over Kalimantan Island. Respecting to the weather, the pilot requested additional fuel onboard for the weather diversion.

The pilot informed to the flight attendant in the preflight briefing, that the flight would encounter turbulence in one hour after departure and if the seatbelt sign on the flight attendants shall make sure that the passengers secured the seatbelt.

¹ Ngurah Rai International Airport (WADD), Bali, Indonesia will be named as Bali for the purpose of this report.

² Hong Kong International Airport (VHHH), Hong Kong will be named as Hong Kong for the purpose of this report.



Figure 2: The flight plan route (M522)

At 1749 UTC, the aircraft departed from Bali with 216 occupants on board consists of two pilots, ten flight attendants and 204 passengers. The Pilot in Command (PIC) acted as Pilot Monitoring (PM) and the Second in Command (SIC) acted as Pilot Flying (PF).

The pilot was instructed by Bali Aerodrome Control Tower unit (Tower) controller to climb to Flight Level (FL)³ 240. After passed altitude 1,000 feet, the flight was transferred to Bali Approach Control unit (APP).

At 1751 UTC, the pilot contacted APP and instructed to climb to FL240 and directed to GALKO⁴ waypoint.

At 1759 UTC, the flight was transferred to Ujung Pandang Area Control Center unit (ACC) and the ACC controller instructed the pilot to climb to FL330.

³ Flight Level (FL) is a surface of constant atmosphere pressure which is related to a specific pressure datum, 1013.2hPa, and is separated from other such surfaces by specific pressure intervals (e.g. FL240 = 24,000 feet above mean sea level when the pressure at sea level is 1013.2 mbs).

⁴ GALKO is a waypoint which located approximately 115 Nm from Ngurah Rai International Airport on heading 357° (06°49'35.51"S 115°04'53.85"E).

At 1809 UTC, the pilot reported that the flight was approaching FL330 and the ACC controller instructed the pilot to climb to FL350. Thereafter at 1818 UTC, the pilot requested for higher flight level to avoid weather and was approved to climb to FL390. One minute later while climbing, the pilot requested turn left heading 325° to avoid weather and approved by the ACC controller with additional instruction to climb to FL410.

At 1823 UTC, the flight reached FL410 and the seatbelt sign was on.

At 1825 UTC, the pilot noticed on the weather radar a clear path between buildup cells on the right direction of the flight. Thereafter the aircraft was turned to the right toward the clear path. The pilots stated that the distance between buildup cells was approximately 40 Nm.

While flying in the middle of the buildup cells, the pilots started to see a magenta color displayed on the radar and this was about 5 Nm ahead, the PF decided to fly straight as buildup cells were on the left and right of the aircraft track.

At 1834 UTC, the flight encountered severe turbulence for about 2 minutes. The autopilot disengaged and the PIC took over control the aircraft by flying the aircraft manually.

At 1837 UTC, the SIC took over control the aircraft and the PIC asked the Senior Purser (SP) to come to the cockpit and informed that the flight had experienced turbulence. The PIC then instructed the SP to check the condition of the other crews and passengers. In few minutes later, the senior purser (SP) informed to the pilots that there were two flight attendants seriously injured and several passengers injured.

At 1840 UTC, the autopilot reengaged by the pilot.

The PIC attempted to contact Integrated Operations Control Center (IOCC)⁵ through satellite phone three times but there was no answer.

At 1858 UTC, after assessed the situation of the injured occupants, the PIC decided to return to Bali.

At 1902 UTC, the pilot reported to the ACC that the flight was approaching point NUGRO⁶ waypoint and requested return to base (RTB) to Bali due to the flight experienced in flight turbulence that caused several occupants were injured. The ACC controller instructed to turn left proceed to GALKO waypoint.

At 1905 UTC, the ACC controller informed APP controller that the CRK6704 returned to Bali due to occupants injured that might require ambulance on arrival.

At 1906 UTC, the PIC pressed the emergency number on the satellite phone and connected to Duty Operation Manager of Hong Kong Airlines (Duty Ops Manager). The PIC informed that they unable to contact the IOCC and explained that the flight was returning to Bali. The Duty Ops Manager then relayed the communication to the IOCC.

5 Integrated Operation Control Center is operation center located in the Hong Kong Airlines head quarter, Hong Kong operates for 24 hours.

6 NUGRO is a waypoint which located approximately 510 Nm from I Gusti Ngurah Rai International Airport on heading 359° (00°09.9'S 114°58.7'E).

At 1910 UTC, the pilot communicated with the IOCC and explained the flight condition and returned to Bali with estimated time of arrival was 2028 UTC. The IOCC advised that the pilot should contact the Medlink⁷ after assessed injury to the occupants.

At 1947 UTC, the ACC controller communicated with the pilot related to a requirement of ambulance assistance on arrival. Two flight attendants seriously injured and five passengers minor injured.

The ACC controller then updated the information regarding the injury of the occupants to the APP. The ACC controller also informed that the pilot did not declare the cause of injury and asked the APP controller to get the detail information after the aircraft landing.

At 1950 UTC, the APP controller informed Bali Aerodrome Control Tower unit (ADC) regarding the returning of CRK 6704. The ADC supervisor then informed the Aircraft Rescue and Fire Fighting unit (ARFF) related to 7 injured occupants on CRK6704 flight and requested ambulance on arrival.

At 2029 UTC, the aircraft landed safely and parked on parking stand number 19.

All injuries occupants were taken to the airport health facility by ambulances then transferred to the nearest hospital for further medical treatment.

1.2 Injuries to Persons

Injuries	Flight crew	Passengers	Total in Aircraft	Others
Fatal	-	-	-	-
Serious	-	-	-	-
Minor	3	11	14	-
TOTAL	3	11	14	-

All the injured occupants were Hong Kong citizen.

1.3 Damage to Aircraft

The aircraft had cracks on the several passenger service units and aft galley ceiling. The damaged passenger service units were found on passenger seat number 11A, 11C, 46C, 57E, 58F, 58G, 59F and 59G.



Figure 3: Several cracks on passenger service units

⁷ MedLink is a company which supplies in-flight medical assistance and pre-flight passenger assessment by phone. MedLink act as a consultant to the Hong Kong Airlines in medical related matters.

1.4 Other Damage

There was no other damage to property and/or the environment.

1.5 Personnel Information

1.5.1 Pilot in Command

Gender : Male
Age : 47
Nationality : Canadian
Marital status : Married
Date of joining company : 27 October 2014
License : ATPL
Date of issue : 8 January 2015 (issued by Hong Kong Authority)
Aircraft type rating : A330, A320
Instrument rating issuance : 4 January 2016
Medical certificate : First Class
Last of medical : 21 July 2015
Validity : 31 July 2016
Medical limitation : The holder shall possess glasses that correct for near vision
Last line check : 2 April 2016
Last proficiency check : 1 April 2016

Flying experience

Total hours : 10,073 hours 54 minutes
Total on type : 242 hours 48 minutes
Last 90 days : 192 hours 6 minutes
Last 60 days : 122 hours 54 minutes
Last 24 hours : 2 hours 58 minutes
This flight : 2 hours 58 minutes
Rest hour prior departure : 23 hours

1.5.2 Second in Command

Gender : Male
Age : 31
Nationality : Malaysian
Marital status : Single

Date of joining company	: 4 December 2015
License	: ATPL
Date of issue	: 9 March 2016 (issued by Hong Kong Authority)
Aircraft type rating	: A330
Instrument rating issuance	: 13 February 2016
Medical certificate	: First Class
Last of medical	: 16 October 2015
Validity	: 31 October 2016
Medical limitation	: The holder shall wear corrective lens for defective distant vision and carry spare set of spectacles
Last line check	: 13 April 2016
Last proficiency check	: 13 February 2016

Flying experience

Total hours	: 4,406 hours 17 minutes
Total on type	: 89 hours 44 minutes
Last 90 days	: 89 hours 44 minutes
Last 60 days	: 87 hours 41 minutes
Last 24 hours	: 2 hours 58 minutes
This flight	: 2 hours 58 minutes
Rest hour prior departure	: 23 hours

1.5.3 Flight Attendants

All flight attendants on this flight held valid licenses and medical certificate.

1.6 Aircraft Information

1.6.1 General

Registration Mark	: B-LNE
Manufacturer	: Airbus
Country of Manufacturer	: France
Type/Model	: A330-223
Serial Number	: 1039
Year of Manufacture	: 2009
Certificate of Airworthiness	
Issued	: 8 October 2015
Validity	: 20 October 2016

Category	: Transport Category (Passenger)
Limitations	: None
Certificate of Registration	
Number	: 720
Issued	: 16 November 2012
Time Since New	: 19,034 hours
Cycles Since New	: 7,278 cycles
Last Major Check	: 19 March 2016 (4C check)
Last Minor Check	: 3 February 2016 (A check)

1.6.2 Engines

Manufacturer	: Pratt & Whitney
Type/Model	: PW4168A-1D
Serial Number-1 engine	: P735009
▪ Time Since New	: 7,301 hours
▪ Cycles Since New	: 18,500 cycles
Serial Number-2 engine	: P735041
▪ Time Since New	: 6,285 hours
▪ Cycles Since New	: 16,271 cycles

1.6.3 Weather Radar System

The aircraft is equipped with a Collins Multiscan WXR-2100 weather radar transceiver with predictive windshear system and was function normally.

1.7 Meteorological Information

The Badan Meteorologi Klimatologi dan Geofisika/BMKG (Indonesia Meteorology Climatology and Geophysics Agency) provided satellite image clouds type surrounded the occurrence area at 1800 UTC (figure 4).

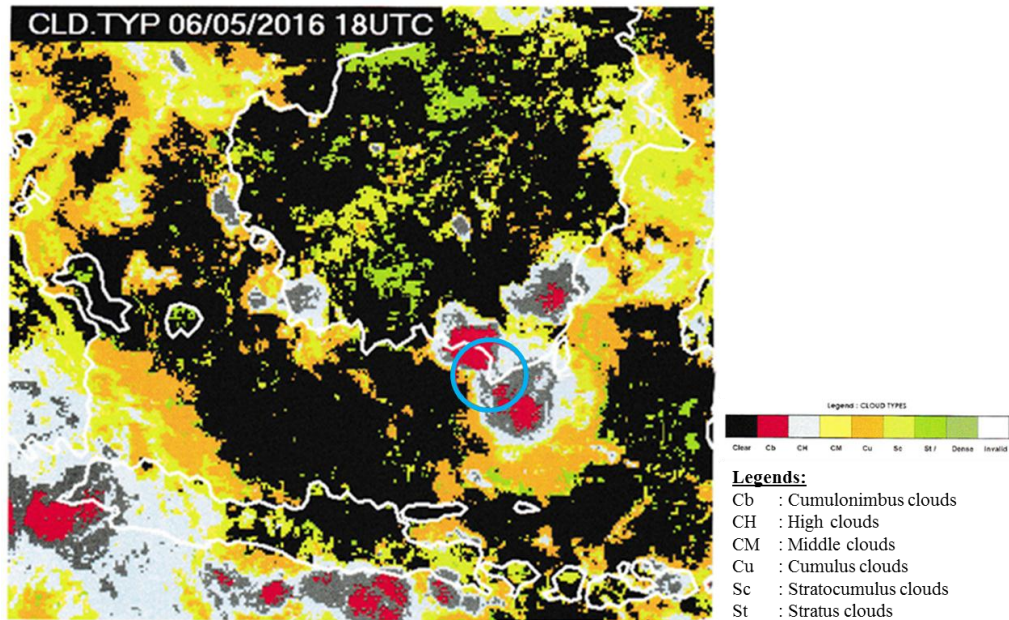


Figure 4: Clouds type satellite imagery on occurrence area (blue circle)

The aircraft operator utilized weather information provided by Hong Kong Airport Meteorological Office as part of the dispatch document prior departure including prognostic chart⁸ and wind/temperature chart issued by World Area Forecast Center London.

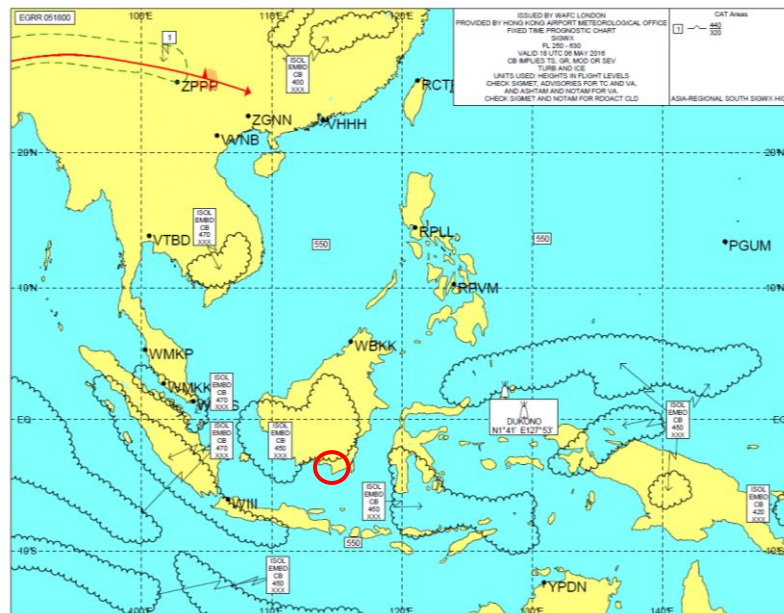


Figure 5: Prognosis chart FL250-630 valid for 6 May 2016 at 1800 UTC

According to the prognosis chart, the area of turbulence event (red circle on figure 4) was not included in the area of potential development of cumulonimbus clouds.

⁸ Prognosis chart is a map displaying the likely weather forecast for a future time.

1.11 Flight Recorders

1.11.1 Flight Data Recorder

The aircraft was equipped with Honeywell Flight Data Recorder (FDR) with part number 980-4700-042 and serial number 19544. The FDR was successfully downloaded in KNKT recorder facility and recorded 1,171 parameters and approximately 27 hours of aircraft operation, which was containing 6 flights including the turbulence flight.

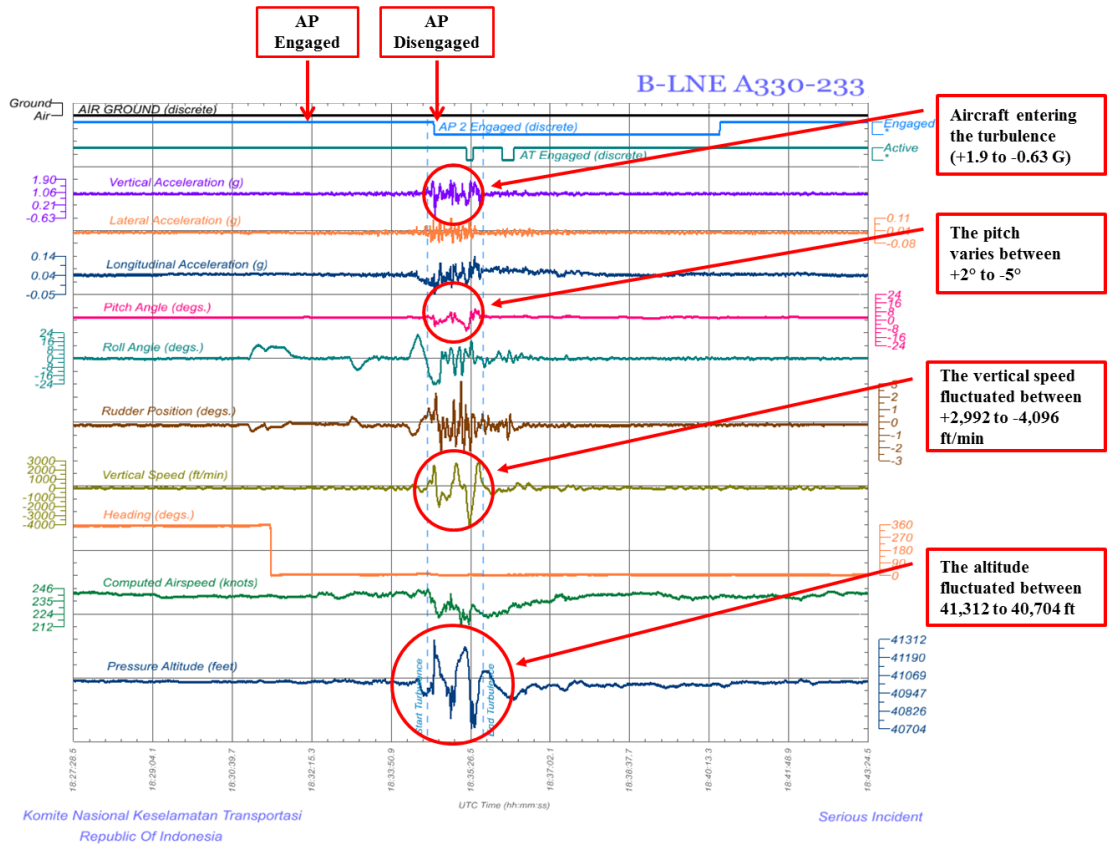


Figure 7: The significant FDR parameters

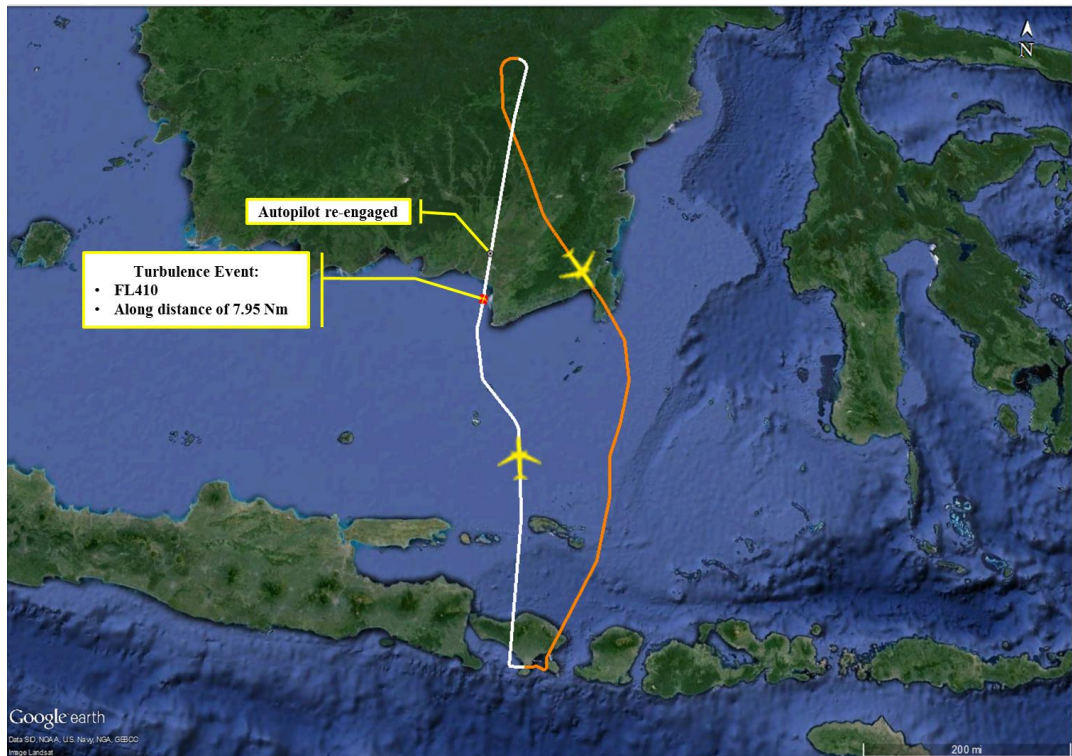


Figure 8: Aircraft flight track based on FDR data

1.11.2 Cockpit Voice Recorder

The aircraft was equipped with L-3 Communications Cockpit Voice Recorder (CVR) with part number 2100-1025-02 and serial number 000604296. The CVR was successfully downloaded in KNKT recorder facility and recorded 2 hours 4 minutes of good quality recording data.

The significant excerpts from the CVR are as follows:

Note:

- P1 is the Pilot in Command
- P2 is the Second in Command
- SP is the Senior Purser
- ACC is the Ujung Pandang Area Control Center unit controller
- APP is the Bali Approach Control unit controller is the Second in Command
- TWR is the Bali Aerodrome Control Tower unit controller
- GND is the Bali Ground Control Tower unit controller

Time (UTC)	From	To	Communication
18:35:07			Noisy sound in the cockpit and a sound similar with autopilot warning disengagement.
18:35:38	P1	P2	The PIC took over control the aircraft
18:35:50	P2	FA	Instructed the flight attendant to sit down
18:37:11	P2	P1	The SIC took over control the aircraft
18:37:24	SP	P1	Informed several food carts fell down (via interphone)

Time (UTC)	From	To	Communication
18:37:24	P1	SP	Instructed to remain seated and assess the condition
18:38:12	P1	P2	The PIC took over control the aircraft
18:42:37	P1	SP	Asked to come to cockpit then explained the flight was encountered turbulence and asked to check the passenger condition.
18:47:39	P2	P1	The SIC took over control the aircraft
18:49:49	P1	ACC	Checked the radio transmission and it was readable and good.
18:52:44	SP	P1	Informed that two flight attendants seriously injured and five passengers injured.
18:56:54	P1	IOCC	PIC called IOCC and there was no reply.
18:57:58	P1	IOCC	PIC called IOCC and there was no reply.
18:58:44	P1	P2	Decided to return to Bali.
18:58:50	P1	IOCC	PIC called IOCC and there was no reply.
19:00:20	P1	SP	Asked whether the injured occupants can wait approximately one hour or they need immediate attention and the SP advised that they were conscious and did not need immediate attention. The SP had asked whether any doctor on board and there was no doctor on board.
19:01:34	P1	ACC	Informed that the flight was approaching NUGRO waypoint and requested return to Bali due to in flight turbulence that caused several injuries of the occupants, and estimated Bali was
19:02:46	ACC	P1	Asked the reason of return to Bali.
19:02:56	P1	ACC	Informed the flight encountered inflight turbulence that caused several occupants injured.
19:03:13	ACC	P1	Confirmed that there were occupants injured and affirmed by the PIC. The ACC then instructed to turn left and proceed to GALKO way point.
19:06:15	P1	DOM	Informed the duty operation manager that the flight returned to Bali due to injured occupants and asked to relay the communication to the IOCC.
19:09:35	P1	P2	Discussed that the flight did not require priority to land as the occupants did not require immediate attention.
19:10:41	P1	IOCC	Explained the occurrence and the estimate arrival in Bali was 2028 UTC. The IOCC officer would inform Bali flight operation for preparing medical assistant on arrival.
19:12:58	P2	ACC	Requested 40 Nm left of track due to weather and approved
19:14:21	SP	P1	Informed that some of the passengers were injured and

Time (UTC)	From	To	Communication
			several ceilings were broken.
19:15:33	IOCC	P1	Advised to contact MedLink.
19:18:09	SP	P1	Advised that before call the MedLink, they have to do an injury assessment by filling the medical complaint form.
19:20:36	P1		Announced to the passenger that the flight was returning to Bali due to some occupants injured.
19:23:53	OPS	P1	Confirmed that the flight was returning to Bali due to occupants injured and affirmed, the PIC informed would contact MedLink.
19:30:27	P1	SP	Informed that as precaution, the flight was diverted away from weather and asked the crew and passenger to remain seated.
19:38:44	P1	ACC	Requested right turn on fly heading 150 and approved.
19:39:18	P1	P2	The PIC took control the aircraft.
19:46:00	P1	ACC	Informed that the flight was maintaining FL410 and the ACC instructed after clear of weather proceed to KEPIK waypoint to follow GALKO 3D arrival.
19:47:36	ACC	P1	Confirmed the number of injury to occupants and answered that there were two crewmembers seriously injured and five passengers injured.
19:49:09	P2	P1	The SIC took over control the aircraft.
19:49:37	P1	MED	Explained the situation of the injured occupants.
20:29:25			A sound of aircraft landed.
20:30:20	GND	P1	Requested clarification the detail of the occurrence.
20:36:14	P1	GND	Explained the flight encountered clear air turbulence and caused two crews and ten passengers injured. There was no damage on the aircraft.

1.12 Wreckage and Impact Information

There were some damages on the ceiling cause by impact to occupants and two food carts that lifted and hit the ceiling then fall back on the floor.



Figure 9: The aft galley condition a few minute after turbulence

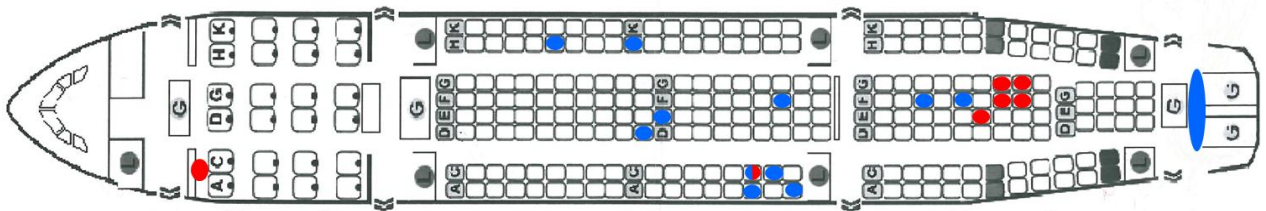


Figure 10: Damage (red) and injury (blue) distribution

1.13 Medical and Pathological Information

The injured occupants experienced varying degrees of injury minor cuts, bruising, sprains, leg abrasions, arms, feet, shoulders, head and nose.

1.14 Fire

There was no evidence of fire in-flight or after the aircraft impacted terrain.

1.15 Survival Aspects

After finished the meal service, the flight attendants cleared up the food carts on the aft galley when sudden turbulences occurred. Three flight attendants and two food carts lifted and hit the ceiling then fell back on the floor three times. These three flight attendants injured and returned to their seats.

Approximately 15 minutes after the occurrence, the SP came to the aft galley and assisted to clear the galley and treated the three injured flight attendants used first aid kit taken from left aft door (L4).

The flight attendant announced to seek medical assistance from the passengers, however there was no medical personnel on board. Thereafter 11 injured passengers seated on 36H, 40H, 41D, 42E, 46A, 46C, 47C, 48A, 48F, 54F and 56F were treated by the flight attendants.

After finished filling the MedLink assessment form, the SP submitted the forms to the pilots. The PIC then called the MedLink and informed the condition of the injured crews and passengers. The communication was about 15 minutes and there was no advice of further treatment to be conducted and medical assistance would be standby upon arrival in Bali.

After landed, the pilot was instructed to park the aircraft on parking stand number 19 where the ambulances and paramedics have been ready 30 minutes before.

The paramedics taken care and evacuated the injured occupants to the airport medical facility by ambulances. Several injured occupants were transferred to the nearest hospital for further medical treatment.

1.16 Tests and Research

This section will be described in the final report.

1.17 Organizational and Management Information

Aircraft Owner & Operator	: Hong Kong Airlines Limited
Address	: 11/F, One Citygate, 20 Tat Tung Road, Tung Chung, Lantau, Hong Kong
Aircraft Operator Certificate	: AOC No. 15
Validity	: 31 March 2018

1.18 Additional Information

The investigation is continuing and will include details but not limited to the meteorological information and detection system.

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.

1.19 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

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

1. The aircraft was airworthy prior to the occurrence and was operated within the weight and balance envelope.
2. All crew held valid licenses and medical certificates.
3. During the preflight, the pilots concerned to the weather chart which depicted significant clouds surround the planned route over Kalimantan Island. Respecting to the weather, the pilot requested additional fuel onboard for the weather diversion.
4. According to the prognosis chart, the area of turbulence event was not included in the area of potential development of cumulonimbus clouds.
5. According to FL390 wind/temperature chart, the wind velocity around the area of turbulence event was northerly 5 knots.
6. During the briefing to the flight attendants, the pilot informed that the flight would encounter turbulence in one hour after departure and if the seatbelt sign on the flight attendants shall make sure that the passengers secured the seatbelt.
7. The seatbelt sign was on while cruising on FL410.
8. The pilot noticed on the weather radar a clear path between buildup cells on the right direction of the flight. Thereafter the aircraft was turned to the right toward the clear path. The pilots stated that the distance between buildup cells was approximately 40 Nm.
9. While flying in the middle of the buildup cells, the pilots started to see a magenta color displayed on the radar and this was about 5 Nm ahead, the PF decided to fly straight as buildup cells were on the left and right of the aircraft track.
10. The flight encountered severe turbulence for about 2 minutes. The autopilot disengaged and the pilot flew the aircraft manually for about 6 minutes.
11. The significant FDR data recorded during the turbulence were: vertical acceleration varied between +1.9 to -0.63 G; the vertical speed fluctuated between +2,992 to -4,096 feet/minutes and the altitude fluctuated between 41,312 to 40,704 feet.
12. The Autopilot (AP) reacted indicated by the aircraft pitch changes ranging from +2° to -5°.
13. There were three flight attendants and 11 passengers injured. After assessed the injured occupants, the PIC decided to return to Bali.
14. After landed, the pilot was instructed to park the aircraft on parking stand number 19 where the ambulances and paramedics have been ready 30 minutes before.

15. The paramedics taken care and evacuated the injured occupants to the airport medical facility by ambulances. Several injured occupants were transferred to the nearest hospital for further medical treatment.
16. The aircraft had minor damaged on the passenger service units.

3 SAFETY ACTION

At the time of issuing this preliminary report, the Komite Nasional Keselamatan Transportasi had been informed of safety actions resulting from this occurrence.

On 12 May 2016, Hong Kong Airlines issued cabin crew notice number CCN 16047 with subject to enhance and maintain high alert for the turbulence during the flight. The details of cabin crew notice can be found on the appendices of this report.

4 SAFETY RECOMMENDATIONS

Komite Nasional Keselamatan Transportasi (KNKT) considered that the safety actions issued by the aircraft operator were relevant to improve safety. In this preliminary report, KNKT consider not to issue safety recommendation.

5 APPENDICES

5.1 Cabin Crew Notice



FOR INTERNAL DISTRIBUTION ONLY

CABIN CREW NOTICE – Safety reminder		
Reference Code	Subject	Date Issued
CCN 16047	Turbulence Reminder	12 May 2016

Effective Date: 12 May 2016

Aircraft Type: All

Crew Category: All cabin crew

Background:

For preparing the high season of typhoon/ thunderstorm in the summer time, cabin crew should maintain high alert for the turbulence during the flight.

Recently, we have experienced Severe Turbulence and Clear Air Turbulence (CAT) causing cabin crew and passengers injuries.

Safety Reminders/ Details:

For your own and passengers' safety, it should be reminded the following safety information/ details before flight.

1. Good communication with cabin crew and passenger is a vital strategy to avoid potential harm from expected or encountered turbulence. If the weather conditions and route forecast indicate that turbulence is likely, the Cabin Crew should be pre-warned prior to entering the expected turbulence area. PIC shall brief the cabin crew on **the expected level of turbulence and duration** and advised passenger to return to, and/or remain seated and to ensure that their **seat belts are securely fastened**. (OM-E 9.2.1)
2. Catering and other loose equipment should be **stowed and secured** until it is evident that the risk of further turbulence has passed.



3. The crew actions regarding different Types of Turbulence has been shown as below table:

 HONGKONG AIRLINES 香港航空 OM - E SEP	PART 9 – SAFETY GENERAL (All FLEET)	E-9	P9
		01MAY2015	

9.2.2 Type of Turbulence and Crew Actions (OM-A 8.3)

Turbulence Classification / Crew Actions

Classification of intensity may be defined as follows. Crew actions in the event of turbulence should be as indicated.

Intensity/ Code	A/C Response	Cabin Situation	Crew Actions prior or in turbulence
Light Chop (1)	No significant change in attitude or altitude.	Occupants may feel strain against seat belt; liquids shake but do not splash out of containers.	Flight Crew: 1) Seat belt sign “ON” for light turbulence. Cabin Crew: 1) Turbulence PA.
Light Turbulence (2)	Slight changes in attitude or altitude of short duration.	Walking can be difficult, liquids shake but do not splash out of containers.	2) Check passenger seat belts fastened. 3) Secure loose galley equipment. Continue service with caution but no hot beverage.
Moderate Chop (3)	Rapid bumps or jolts, but no significant change in attitude or altitude.	Occupants feel definite strain against seat belt.	Flight Crew: 1) Seat belt sign “cycle once” and remain “ON”.
Moderate Turbulence (4)	Changes in airspeed, attitude or altitude occur, but control is normal.	Loose objects move about; liquid splashes from cups. Very difficult to walk.	2) PA Command; “cabin crew be seated” . 3) Turbulence PA if time permits Cabin Crew:
Severe Turbulence (5) intentional flight prohibited	Large, abrupt changes in airspeed, attitude or altitude occur. Airplane may be briefly out of control. TLB write-up required.	Occupants forced against seat belts. Loose objects tossed about cabin or lifted from floor. Walking is impossible without holding on to something.	1) Turbulence PA. 2) Stop service. Sit down and hold on if required. 3) Set cart brakes in present position,
Extreme Turbulence (6) Intentional flight prohibited.	Airplane tossed violently about; control is practically impossible. May cause structural damage. TLB write-up required.		(*) Inspect cabin damage after turbulence.

4. For the period of meal and hot beverage service, cabin crew are advised to maintain good communication with cockpit crew regarding turbulence, route and weather information with the consideration of service-time-management. According to the cockpit information, CIC shall provide **service flexibility** and appropriate arrangement to avoid potential harm from expected or encountered turbulence. The main objective is to reduce the risk of crew members and/or passengers injury during turbulence. If significant weather or turbulence is expected, CIC is to use his/ her discretion to shorten the service. For any feedbacks/ difficulties regarding service procedure alternation/ cancelation, CIC should **make a note on flight report** accordingly.

5. Section Leaders should be able to determine if there is a need to suspend service and instruct crew members to secure themselves i.e. take the nearest seats if the cabin movement is too great to continue with the service. Cabin crew should always take extra precaution, secure themselves on the nearest seat and hold on to the strong points in the cabin such as the **overhead handrail, armrest** etc. Keep SP/ FP informed of the situation in your area whenever possible.

6. For the cabin crew **Pre-Flight Briefing at ABO**, CIC are advised to ask **at least ONE** safety question regarding turbulence. Kindly find the following Turbulence related safety questions as a reference:

Pre-flight Safety Question on Jan 2016:

Q1. Please state Cabin Crew actions prior or in turbulence under Light Chop/ Light Turbulence are:

Ans. :

- Turbulence PA
- Check passenger seat belts fastened
- Secure loose galley equipment. Continue service with caution but no hot beverage

Q3. In the middle of the flight or during cruising attitude. Please state the indication if seat belt sign turns "ON".

Ans.:

Light turbulence/Light Chop.

Q4. The PA command and Signal Cabin Crew will receive under Moderate/ Severe Turbulence are:

Ans. :

- Seat belt sign "cycle once" and remain "ON"
- PA: "Cabin Crew be seated"
- Turbulence PA if time permits

Q9. Cabin Crew actions prior or in turbulence under Moderate/ Severe Turbulence are:

Ans. :

- Turbulence PA
- Stop service. Sit down and hold on if required.
- Set cart brakes in present position

7. When turbulence encountered:
- i. Assess the bumpiness of the flight
 - ii. Make PA to alert passengers
 - iii. Check the cabin and lavatories to ensure all passengers strapped in if situation allows
 - iv. Cabin crew is suggested to use the handrail under the overhead locker when performing the cabin checks
 - v. Secure yourself by grasp hold the handle in the galley
 - vi. Ensure overhead locker and galley equipment secure
 - vii. Do not handle / serve hot beverage during turbulence**
 - viii. If necessary, stop all service, take the nearest seat and fasten seat belt as soon as possible
 - ix. Crew should not leave any food cart and service cart unattended during flight. Stow carts and service equipment if situation allows.
 - x. If the cabin condition becomes vigorous (i.e. Severe Turbulence or Clear Air Turbulence), cabin crew shall take appropriate action to protect yourself first, take any available seat nearby and secure yourself as soon as possible.

Should you have any inquiries, please contact Cabin Crew Standard Team via crewstandard@hkairlines.com.

Have a Safe & Happy Flight!

Content Owner	Cabin Crew Standard & Training
Approver	General Manager, Inflight Service
Distribution List	Electronic copies: Cabin Crew Standard & Training; Cabin Crew Operation; SDD Human Resources and Administration; SDD QA; All Cabin Crew via E-library Hard copies: CCN files; ABO Notice board
Implementation Date	12 May 2016
Incorporation Date	This notice will be incorporated in Cabin Service Standard Manual in June 2016