



**KOMITE NASIONAL KESELAMATAN TRANSPORTASI
REPUBLIC OF INDONESIA**

PRELIMINARY

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Aircraft Serious Incident Investigation Report

PT. Garuda Indonesia

Bombardier CRJ1000; PK-GRP

Juanda International Airport Surabaya

Republic of Indonesia

18 January 2018

2018

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.

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Jakarta, June 2018

**KOMITE NASIONAL
KESELAMATAN TRANSPORTASI
CHAIRMAN**



SOERJANTO TJAHJONO

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ABBREVIATIONS AND DEFINITIONS

AIP	:	Aeronautical Information Publication
AOC	:	Aircraft Operator Certificate
ATPL	:	Airline Transport Pilot License
BMKG	:	<i>Badan Meteorologi Klimatologi dan Geofisika</i>
C of A	:	Certificate of Airworthiness
C of R	:	Certificate of Registration
CPL	:	Commercial Pilot License
CVR	:	Cockpit Voice Recorder
DGCA	:	Directorate General of Civil Aviation
FDR	:	Flight Data Recorder
hPa	:	hectopascal
KNKT	:	<i>Komite Nasional Keselamatan Transportasi</i> (National Transportation Safety Committee)
LT	:	Local Time
m	:	Meters
PBN	:	Performance Based Navigation
PF	:	Pilot Flying
PIC	:	Pilot in Command
PM	:	Pilot Monitoring
RNAV (GNSS)	:	RNAV (Area Navigation) is the aircraft capability that allows to navigate from point to point, defined by latitude/longitude and independent of any ground-based system
SIC	:	Second in Command
SPECI	:	SPECI is a special report or forecast if significant weather changed had occurred or expected to occur
STAR	:	Standard Instrument Arrival
UTC	:	Universal Time Coordinated
PIC	:	Pilot in Command

SYNOPSIS

On 18 January 2018, a Bombardier CRJ1000 aircraft, registration PK-GRP was being operated by PT. Garuda Indonesia on a scheduled passenger flight from Pattimura International Airport (WAPP/AMQ), Ambon to Juanda International Airport (WARR/SUB), Surabaya, with flight number GA681.

At 0655 UTC (1555 LT), on daylight condition, the aircraft departed Pattimura International Airport, Ambon and cruising at altitude 38,000 feet. The flight was uneventful until commencing approach at Surabaya and there was no report or record of aircraft system abnormality during the flight.

At 0933 UTC, the pilot initiated descent to altitude of 25,000 feet. Then instructed to follow the Standard Instrument Arrival (STAR) route and was on sequence number nine for landing.

At 1012 UTC, the pilot reported leaving point SABIT for RNAV approach and the controller informed heavy rain over the field and the visibility was 1,000 meters. The pilot reported the runway was in sight.

The pilot continued the approach landing and performed before landing checklist. At 1015 UTC, the PM reminded that the headwind was 17 knots and the crosswind component was 14 knots from the left.

The controller advised the pilot to report when the runway in sight and the pilot replied that the runway was in sight. The controller informed that the wind was from 250° with the speed of 7 knots and issued landing clearance.

At 1018 UTC, the aircraft touched down with the vertical acceleration of 1.9 g as recorded on the Flight Data Recorder (FDR). The aircraft veered off to the right and out of the runway pavement at position near taxiway N6. The pilot recovered by applying full left rudder and the aircraft returned to the runway near taxiway N5. After the aircraft returned to the runway, the pilot applied thrust reversers and brakes.

No one injured as the result of the occurrence.

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 investigation, KNKT will immediately bring the issues to the attention of the relevant parties and publish as required.

The KNKT had been informed safety action taken by the PT. Garuda Indonesia and considered relevant to the occurrence.

KNKT is not issues safety recommendation in this preliminary report.

1 FACTUAL INFORMATION

1.1 History of the Flight

On 18 January 2018, a Bombardier CRJ1000 aircraft, registration PK-GRP was being operated by PT. Garuda Indonesia on a scheduled passenger flight from Pattimura International Airport (WAPP/AMQ), Ambon to Juanda International Airport (WARR/SUB), Surabaya with flight number GA681.

On board of this flight was three pilots, three flight attendants, and 57 passengers. The Pilot in Command (PIC) who was qualified as flight instructor and acted as pilot flying (PF) and the Second in Command (SIC) was pilot under training acted as pilot monitoring (PM). The third pilot was another pilot under training who sat in the cockpit jump seat acted as observer.

At 0655 UTC¹ (1555 LT), on daylight condition, the aircraft departed Pattimura International Airport, Ambon and cruising at altitude 38,000 feet. The flight was uneventful until commencing approach at Surabaya and there was no report or record of aircraft system abnormality during the flight.

At 0933 UTC, the pilot initiated descent to altitude of 25,000 feet.

At 0938 UTC, the pilot received clearance for further descent to altitude of 17,000 feet, the pilot requested to fly direct to waypoint VERSA and was not approved by the air traffic controller (controller). The pilot was instructed to follow the Standard Instrument Arrival (STAR) route and was on sequence number nine for landing.

After several descend clearances, at 1005 UTC, the pilot instructed to fly heading 330° and to descend to altitude of 2,500 feet.

At 1007 UTC, the pilot received clearance to continue descent and to reduce the aircraft speed, then instructed to turn left to point SABIT and clear for RNAV² approach runway 28 (see figure 3).

At 1012 UTC, the pilot reported leaving point SABIT for RNAV approach and the controller informed heavy rain over the field and the visibility was 1,000 meters. The pilot reported the runway was in sight.

The pilot continued the approach landing and performed before landing checklist.

At 1015 UTC, the PM reminded that the headwind was 17 knots and the crosswind component was 14 knots from the left.

The controller advised the pilot to report when the runway in sight and the pilot replied that the runway was in sight. The controller informed that the wind was from 250° with the speed of 7 knots and issued landing clearance.

At 1016 UTC, the PF requested to PM to set the wiper to slow selection and then changed the request to set wiper to high selection.

¹ The 24-hours clock in Universal Time Coordinate (UTC) is used in this report to describe the local time as specific events occurred. Ambon is UTC+9 and Surabaya is UTC+7.

² RNAV (Area Navigation) is the aircraft capability that allows to navigate from point to point, defined by latitude/longitude and independent of any ground-based system.

At 1018 UTC, the aircraft touched down with the vertical acceleration of 1.9 g as recorded on the Flight Data Recorder (FDR). The aircraft veered off to the right and out of the runway pavement at position near taxiway N6. The pilot recovered by applying full left rudder and the aircraft returned to the runway near taxiway N5. After the aircraft returned to the runway, the pilot applied thrust reversers and brakes.

The controller instructed the pilot to vacate runway via taxiway S2 and confirmed whether the aircraft landed normally. The pilot informed that the aircraft veered off to the right and might have hit the runway light. The pilot continued taxi to the apron and parked. The passengers disembarked normally.

No one injured as the result of this occurrence. The damage found on the aircraft were dents on the right inboard flap lower skin. One of the runway lights was damaged.

1.2 Personnel Information

1.2.1 Pilot in Command (PIC)

The PIC was 54 years old, held valid Airplane Transport Pilot License (ATPL) and first class medical certificate with limitation to possess glasses that correct for near vision.

The pilot had Bombardier CRJ1000 type rating and experience of 2,752 hours on this aircraft type and the total flying experience was 18,220 hours.

1.2.2 Second in Command (SIC)

The SIC was 27 years old, held valid Commercial Pilot License (CPL) and first class medical certificate with no limitation.

The pilot rated for Bombardier CRJ1000 with total flying experience of 112 hours on this aircraft type.

1.3 Aircraft Information

Registration Mark	: PK-GRP
Manufacturer	: Bombardier Inc.
Country of Manufacturer	: Canada
Type/ Model	: CL-600-2E25 (Series 1000)
Serial Number	: 19039
Year of manufacture	: 2014
Certificate of Airworthiness	
Issued	: 19 May 2017
Validity	: 18 May 2018
Category	: Transport

Limitations : None
 Certificate of Registration
 Number : 3481
 Issued : 19 May 2016
 Validity : 18 May 2019
 Time Since New : 7,567 hours
 Cycles Since New : 6,339 cycles
 Last Minor Check : A-Check (4 January 2018)

1.4 Meteorological Information

Weather report for Juanda International Airport, issued 18 January 2018 were as follows:

Time (UTC)	0930	1000	1030	1100
Wind (°/knots)	260/04	230/04	220/08 and variable between 190 to 260	270/03
Visibility (m)	5,000	5,000	5,000	5,000
Weather	Haze	Rain	Rain	Rain
Cloud ³	Scattered, at 1,800 feet above aerodrome level, type of cloud cumulonimbus	Scattered, at 1,800 feet above aerodrome level, type of cloud cumulonimbus	Scattered, at 1,800 feet above aerodrome level, type of cloud cumulonimbus	Scattered, at 1,800 feet above aerodrome level, type of cloud cumulonimbus
Temperature / Dew point (°C)	26/24	26/24	25/24	25/25
QNH (hPa)	1,006	1,006	1,006	1,007
Remarks	No significant changes expected in the near future	The following weather phenomena are expected to arise temporarily: Visibility: 5,000 m weather: Light Rain	The following weather phenomena are expected to arise temporarily: until 1130 UTC, Visibility: 5,000 m weather: Rain	the following meteorological phenomena were observed: Rain No significant changes expected in the near future

³ Cloud amount is assessed in total which is the estimated total apparent area of the sky covered with cloud. The international unit for reporting cloud amount for Scattered (SCT) is when the clouds cover 3/8 up to 4/8 area of the sky.

The SPECI⁴ weather report stated that at 0946 UTC had a remark stated no significant weather changes in the near future and at 1014 UTC with the weather changed significantly when the visibility decreased to 1,000 meters and heavy rain, the weather expected to arise temporarily at 1100 UTC the visibility became 5,000 m and light rain.

The following satellite images at 1010 UTC and 1020 UTC were provided by the Bureau of Meteorology, Climatology and Geophysics (BMKG).

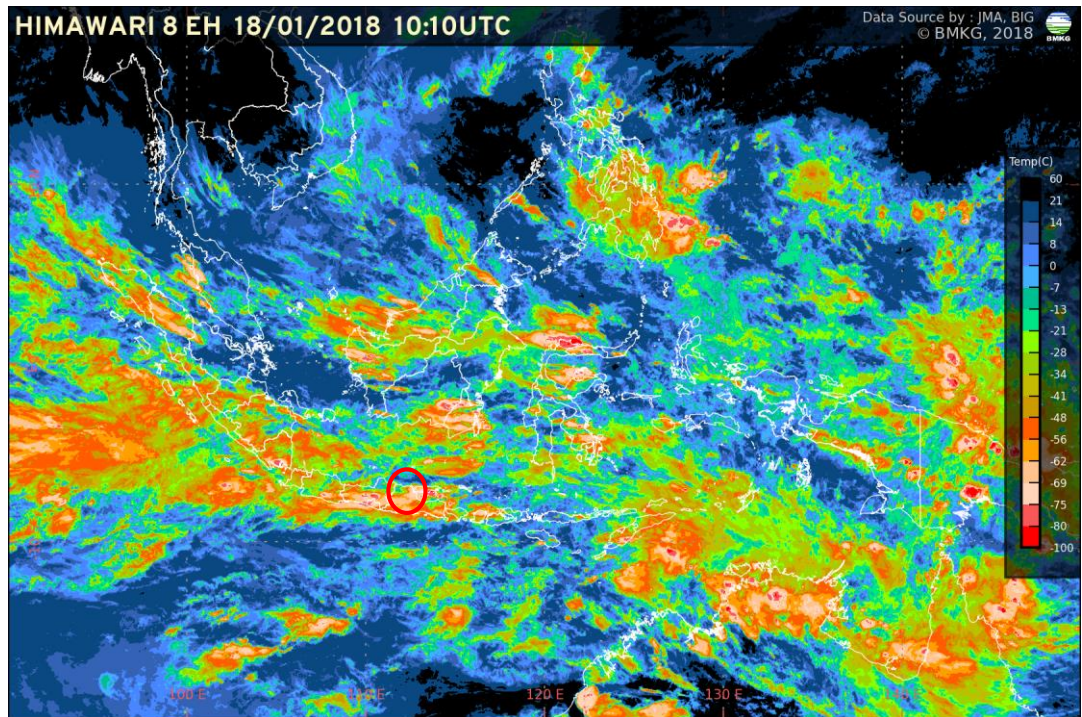


Figure 1: The satellite weather image at 1010 UTC

⁴ SPECI is a special report or forecast if significant weather changed had occurred or expected to occur.

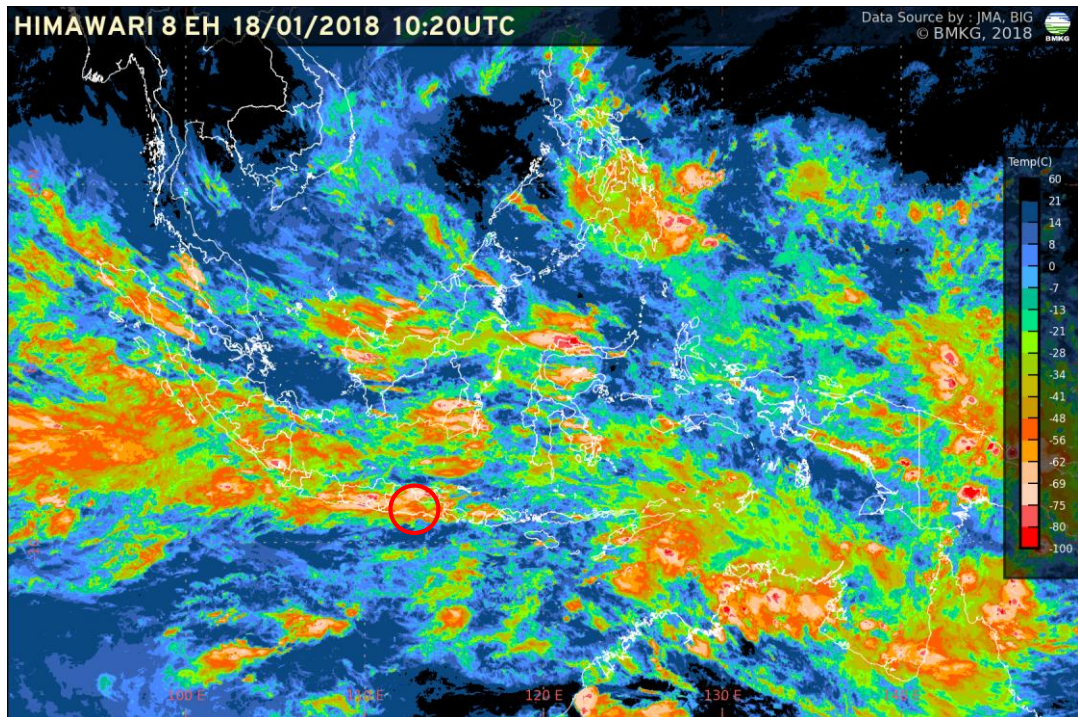


Figure 2: The satellite weather image at 1020 UTC

Juanda air traffic controller observed that during the aircraft approach, the weather condition was heavy rain. The rain moved from east to the west of the airport.

1.5 Aids to Navigation

Runway 28 Surabaya has Performance Based Navigation (PBN) approach guidance, which utilized RNAV (GNSS) approach. The instrument approach chart provided by Directorate General of Civil Aviation on Aeronautical Information Publication (AIP) Volume II showed on the following figure.

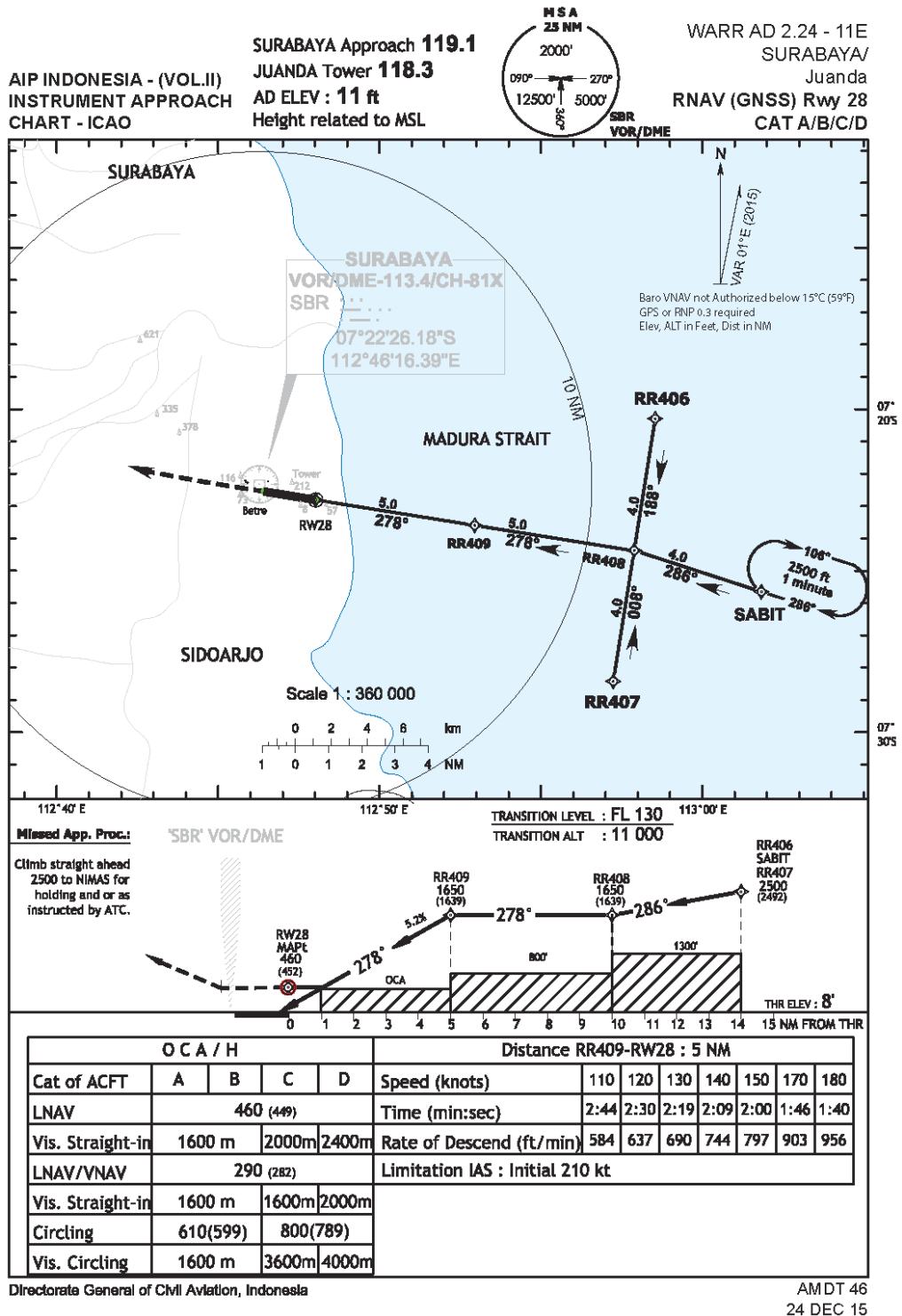


Figure 3: The RNAV approach chart as published in AIP Volume II

1.6 Aerodrome Information

Juanda International Airport (WARR) located at Surabaya, East Java operated by PT. Angkasa Pura I (Persero). The airport elevation was nine feet above mean sea level. The runway azimuth of 10-28 with dimension of 3,000 meters long and 45 meters wide. On both sides of the runway available extra pavement that makes the width of the total pavement was 60 meters.

1.7 Flight Recorders

1.7.1 Flight Data Recorder

The aircraft was fitted with Flight Data Recorder (FDR) manufactured by Honeywell with part number 980-4700-042 and serial number 12370. After the serious incident, the recorder was transported to KNKT recorder facility for data downloading process.

The FDR recorded 160.6 hours which was containing 104 flights and including this serious incident flight with total of 530 parameters.

The data of relevant parameters was described in the graph below:

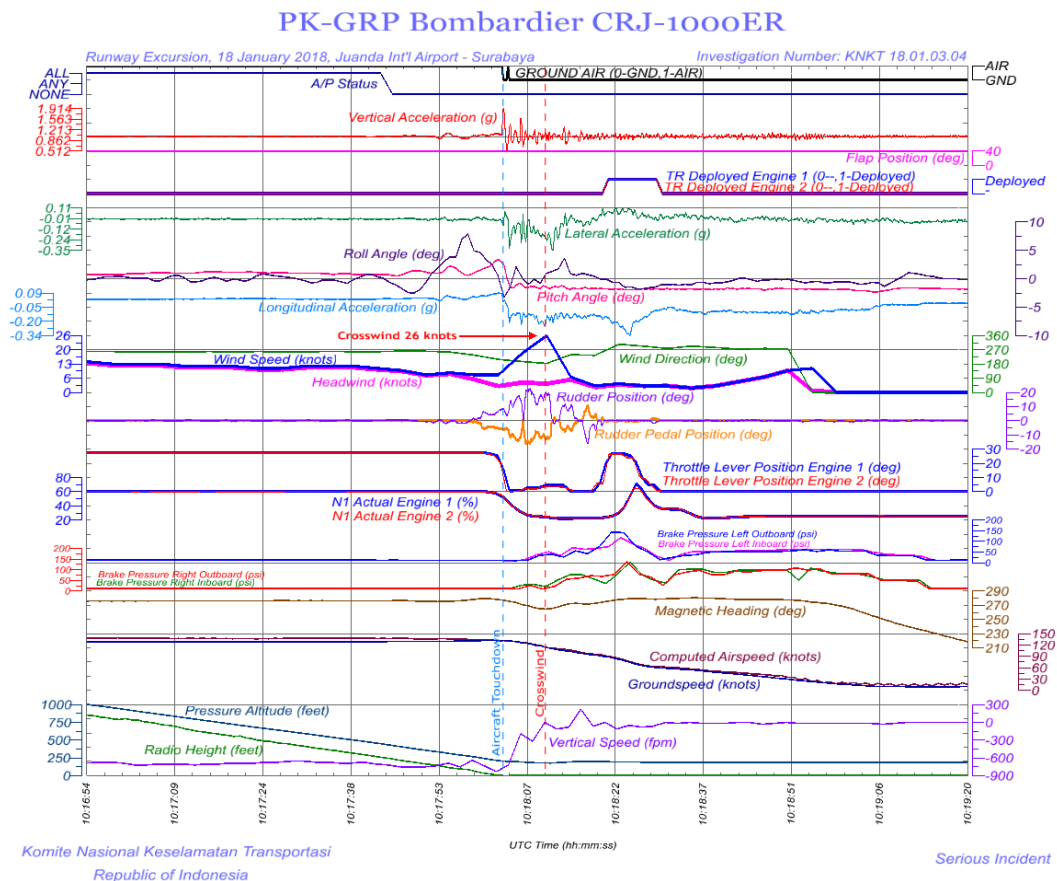


Figure 4: The relevant FDR parameters

1.7.2 Cockpit Voice Recorder

The aircraft was fitted with Cockpit Voice Recorder (CVR) manufactured by Honeywell with part number 980-6022-001 and serial number 08433. The CVR data has been successfully downloaded and contained 2 hours and 4 minutes of good quality recording data.

The communication between controller and the pilot was recorded on the automatic ground base recording facility and the CVR.

The detail of the CVR data and the communication between controller and the pilot will be included in the final report.

1.8 Wreckage and Impact Information

The wheel mark from the right main wheel was found at approximately 3 meters out of runway surface. The marks started from near taxiway N6 and reentered the runway pavement near taxiway N5.



Figure 5: Wheel marks on the runway shoulder.

1.9 Organizational and Management Information

1.9.1 Aircraft Operator

Aircraft Owner	:	Nordic Aviation Leasing Seven., Ltd.
Address	:	20 Bendemeer Road, #03-12, Singapore 339914
Aircraft Operator	:	PT. Garuda Indonesia Airways
Address	:	Jl. Kebun Sirih No. 17, Jakarta Pusat, Indonesia

PT. Garuda Indonesia Airways had a valid Air Operator Certificate (AOC) number 121-001 authorize to conduct scheduled passenger transport. The operator operated several aircraft types of Airbus A330, Boeing 777, Boeing 737, ATR 72-212 and CRJ 1000 NexGen.

1.10 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 FINDINGS⁵

1. All crew held valid licenses and medical certificates.
2. The aircraft had valid Certificate of Airworthiness (C of A) and Certificate of Registration (C of R).
3. There was no report or record of aircraft system malfunction prior to the occurrence.
4. The pilot received clearance for descent and instructed to follow the Standard Instrument Arrival (STAR) route, then to conduct RNAV approach runway 28.
5. At 1012 UTC, the controller informed heavy rain over the field and the visibility was 1,000 meters. Thereafter, the pilot reported the runway was in sight.
6. The pilot continued the approach landing and performed before landing checklist.
7. The PM reminded that the headwind was 17 knots and the crosswind component was 14 knots from the left.
8. The Special weather published by BMKG stated that 1014 UTC with remarks the weather changed significantly when the visibility decreased to 1,000 meters and heavy rain, the weather expected to arise temporarily.
9. At 1015 UTC, the controller informed that the wind was from 250° with the speed of 7 knots and issued landing clearance.
10. At 1018 UTC, the aircraft touched down with the vertical acceleration of 1.9 g as recorded on the Flight Data Recorder (FDR).
11. The aircraft veered off to the right and out of the runway pavement at position near taxiway N6. The pilot recovered by applying full left rudder and the aircraft returned to the runway near taxiway N5. After the aircraft returned to the runway, the pilot applied thrust reversers and brakes.
12. The pilot continued taxi to the apron and parked. No one injured on this occurrence.

⁵ 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 KNKT had been informed safety actions taken by the aircraft operator resulting from this occurrence. The safety actions were as follows:

1. The flight operation department issued notice to flight Crew number 005/18 dated 19 January 2018 with subject wet season to urge all the pilots to strictly follow the procedure regarding wet runway operation and adverse weather condition.
2. Conducted corrective training to the pilot.

The detail of the notice to flight crew is available on the appendices of this report.

4 SAFETY RECOMMENDATIONS

The KNKT acknowledges the safety actions taken by PT. Garuda Indonesia and considered that the safety actions were relevant and sufficient to improve safety based on the factual information available at the time of issuance of this Preliminary Report. Therefore, the KNKT is not issue safety recommendation in this report.

5 APPENDICES

5.1 Notice to Flight Crew



Date : 19 January 2018

FLIGHT OPERATION

Notice To : Flight Crew
Nr : 005 / 18
Subject : Wet Season

Dear all Pilots,

In response with the latest runway excursion incident and to prevent this incident to happen again, we urge all pilots to strictly follow procedures regarding wet runway operation and adverse weather condition compile in **Notice to Flight Crew No. 068/17 with subject Wet Season**.

The procedures related to the wet season operations, covered in:

1. Wet runway takeoff & landing technique and procedure, as in AOM/FCOM flight technique.
2. OM-A 14.1 Adverse weather / hazardous atmospheric condition.
3. OM-A 9.5.1 Weather minima.

There are some items that also need special attention, such as:

Taxi consideration:

- Exercise extreme caution; ramp and taxiway may be very slippery.
- Jet blast consideration; may result ground personnel injury and equipment damage.
- Adhere to taxi speed limitation, especially during turn on wet/contaminated runway, vacating runway or lining up the runway.

THE STANDARD TAKEOFF MINIMA

- Adhere to the takeoff visibility minima as stated in OM-A 9.5.1-06; 9.3.1.
- If the takeoff conducted with visibility below landing minima, takeoff alternate is required.

Initiation of the approach (OM-A 9.5.1-02; 9.5.1-07)

- Allow only reported visibility equal to or greater than landing minima.
- Unless otherwise required by local procedure, when commencing an instrument approach, no pilot may continue an approach past the FAF (Final Approach Fix), or where a Final Approach Fix is not used, begin the Final Approach Segment of an instrument approach procedure, unless the latest reported visibility to be equal to or more than the visibility minimums prescribed for that procedure. If reported weather conditions are received after passing FAF (Final Approach Fix), an instrument approach may be continued down to DA/H or MDA/H.

Descent below MDA/DA/DH

Descent below MDA/DA/DH is allowed when:

- The required visual reference has been obtained and can be maintained.
- The Pilot In Command is convinced that a safe landing or rollout on the intended runway can be made at normal rate of descent using normal maneuvers and when that rate of descent will allow touchdown to occur within the touchdown zone.
- If any time after descent passing MDA/DA/DH the Pilot In Command is no longer convinced that a safe landing and rollout can be made, **GO AROUND**.

Landing consideration:

- Firm touchdown within the touchdown zone, and avoid floating.
- Ensure ground spoilers are fully extended at touchdown.
- To achieve optimum landing distance, apply the proper the flight technique as in AOM/FCOM.
- After touchdown, never assume that the last 2000 feet of the runway have the same braking action as the touchdown zone.

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Note:

- Ensure to fulfill all stabilized approach criteria at all time
- Always make landing distance assessment, and make sure that there is sufficient runway to land, especially when standing water is present, which can reduce braking effectivity.
- for any runway changes, re-calculate the landing performance and landing distance required.
- In applying crosswind limitation on takeoff and landing, the Pilot In Command shall use steady wind.
- When the criteria of stabilized approach cannot be fulfilled, or at any time after descent passing MDA/DA/DH the Pilot In Command is no longer convinced that a safe landing and rollout can be made, **GO AROUND**.

Thank you for your attention and cooperation.
Safe flight.

Kindly regards,

PT GARUDA INDONESIA (PERSERO) Tbk.
VP FLIGHT OPERATION



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