

AI2012-3

**AIRCRAFT SERIOUS INCIDENT
INVESTIGATION REPORT**

JAPAN AIR COMMUTER CO., LTD.

J A 8 4 4 C

ALL NIPPON AIRWAYS CO., LTD.

J A 6 0 2 A

April 27, 2012



The objective of the investigation conducted by the Japan Transport Safety Board in accordance with the Act for Establishment of the Japan Transport Safety Board (and with Annex 13 to the Convention on International Civil Aviation) is to prevent future accidents and incidents. It is not the purpose of the investigation to apportion blame or liability.

Norihiro Goto
Chairman,
Japan Transport Safety Board

Note:

This report is a translation of the Japanese original investigation report. The text in Japanese shall prevail in the interpretation of the report.

AIRCRAFT SERIOUS INCIDENT INVESTIGATION REPORT

- 1 JAPAN AIR COMMUTER CO., LTD.
BOMBARDIER DHC-8-402, JA844C
- 2 ALL NIPPON AIRWAYS CO., LTD.
BOEING 767-300, JA602A

ABOUT 3 KM NORTHWEST OF FUKUOKA AIRPORT
AROUND 11:59 JST, MAY 10, 2011

April 6, 2012

Adopted by the Japan Transport Safety Board

Chairman	Norihiro Goto
Member	Shinsuke Endoh
Member	Toshiyuki Ishikawa
Member	Sadao Tamura
Member	Yuki Shuto
Member	Toshiaki Shinagawa

Abbreviations used in this report are as follows:

AIP	: Aeronautical Information Publication
BD	: Bright Display
CVR	: Cockpit Voice Recorder
DFDR	: Digital Flight Data Recorder
GND	: Ground
ICAO	: International Civil Aviation Organization
IFR	: Instrument Flight Rules
ILS	: Instrument Landing System
IMC	: Instrument Meteorological Conditions
MM	: Middle Marker
OM	: Outer Marker
PF	: Pilot Flying
PM	: Pilot Monitoring
QAR	: Quick Access Recorder
REL	: Runway Entrance Lights
RVR	: Runway Visual Range
RWSL	: Runway Status Light System
THL	: Takeoff Hold Lights
TWR	: Tower
VMC	: Visual Meteorological Conditions

Unit Conversion Table

1 ft	: 0.3048 m
1 kt	: 1.852 km/h (0.5144 m/s)
1 nm	: 1,852 m

1. PROCESS AND PROGRESS OF THE INVESTIGATION

1.1 Summary of the Serious Incident

The occurrence covered by this report falls under the category of “An attempt of landing on a runway being used by the other aircraft“ as stipulated in Clause 2, Article 166-4 of the Ordinance for Enforcement of the Civil Aeronautics Act of Japan and is classified as an aircraft serious incident.

At about 11:59 Japan Standard Time (JST: UTC + 9hr, unless otherwise stated all times are indicated in JST on a 24-hour clock) on May 10 (Tuesday), 2011, a Bombardier DHC-8-402, registered JA844C, operated by Japan Air Commuter Co., Ltd., had been approaching Fukuoka Airport as the scheduled flight 3626 of the company, after receiving a landing clearance from an air traffic controller. In the meantime, a Boeing 767-300, registered JA602A, operated by All Nippon Airways Co., Ltd., entered the runway 16 via the taxiway E2 as the scheduled flight 487 of the company after receiving a take-off clearance from an air traffic controller. When the JA844C requested the air traffic controller to confirm the landing clearance for the aircraft, the controller instructed it to perform a go-around.

There were 79 persons on board JA844C, consisting of the Pilot in Command (PIC), three other crewmembers, and 75 passengers; 129 persons on board JA602A, consisting of the PIC, seven other crewmembers, and 121 passengers. But there were no injuries to these persons or damage to the two aircraft.

1.2 Outline of the Serious Incident Investigation

1.2.1 Investigation Organization

On May 10, 2011, the Japan Transport Safety Board (JTSB) designated an investigator-in-charge and two other investigators to investigate this serious incident.

1.2.2 Representatives from Foreign Authorities

The JTSB notified this serious incident to the United States of America and Canada as the States of Design and Manufacture of the aircraft involved in this serious incident. An accredited representative of the United States of America participated in the investigation; on the contrary Canada did not designate any accredited representative.

1.2.3 Implementation of the Investigation

May 10 to 12, 2011 On-site investigation and Interviews

1.2.4 Comments from Parties Relevant to the Cause of the Serious Incident

Comments were invited from parties relevant to the cause of the serious incident.

1.2.5 Comments from the Relevant States

Comments on the draft report were invited from the relevant States.

2. FACTUAL INFORMATION

2.1 History of the Flight

The Bombardier DHC-8-402, registered JA844C (hereinafter referred to as “the Aircraft A”), operated by Japan Air Commuter Co., Ltd., had taken off from Miyazaki Airport at 11:22 on May 10, 2011, and was approaching Fukuoka Airport upon receiving a landing clearance from an air traffic controller (hereinafter referred to as “controller”).

The outline of the flight plan for the Aircraft A was as follows:

Flight rules:	Instrument flight rules (IFR)
Departure aerodrome:	Miyazaki Airport
Estimated off-block time:	11:15
Cruising speed:	348 kt
Cruising altitude:	Flight Level (FL) 150
Route :	SASIK (reporting point) – G339 (Airway) – DGC (Fukuoka VORTAC)
Destination aerodrome:	Fukuoka Airport
Total estimated elapsed time:	35 min
Fuel load expressed in endurance:	2 h and 55 min

In the cockpit of the Aircraft A, the PIC sat in the left seat as the PF (pilot flying: pilot mainly in charge of flying) and the First Officer (FO) in the right seat as the PM (pilot monitoring: pilot mainly in charge of duties other than flying).

In the meantime, the Boeing 767-300, registered JA602A (hereinafter referred to as “the Aircraft B”), operated by All Nippon Airways Co., Ltd., entered the runway 16 via the taxiway E2 after receiving a take-off clearance.

The outline of the flight plan for the Aircraft B was as follows:

Flight rules:	Instrument flight rules (IFR)
Departure aerodrome:	Fukuoka Airport
Estimated off-block time:	11:25
Cruising speed:	467 kt
Cruising altitude:	Flight Level (FL) 380
Route:	YAMGA (reporting point) – HKC (Kagoshima VORTAC) – Y45 (RNAV Route) – ONC (Okinoerabu VORTAC) – NHC (Naha VORTAC)
Destination aerodrome:	Naha Airport
Total estimated elapsed time:	1 h and 24 min
Fuel load expressed in endurance:	4 h and 31 min

In the cockpit of the Aircraft B, the PIC sat in the left seat as the PF and the FO in the right seat as the PM.

The history of the flights of the Aircraft A and the Aircraft B up to the time of the serious incident was summarized as below, based on the records of air traffic control (ATC) communication, the radar tracking records, the data of the digital flight data recorder (DFDR) of the Aircraft A, the data of the quick access recorder (QAR) of the Aircraft B, as well as the statements of the crewmembers of both aircraft and controllers.

2.1.1 History of the Flights Based on the Records of ATC Communication, DFDR and QAR

11:48:29 The Aircraft B requested a pushback from Spot 8 to the Fukuoka aerodrome ground controller (hereinafter referred to as “the Ground (GND)”).
The GND instructed the Aircraft B to hold.

11:53:04 The GND approved a pushback for the Aircraft B. The Aircraft B read it back.

11:55:23 The Aircraft A began communicating with the Fukuoka aerodrome controller (hereinafter referred to as “the Tower (TWR)”) about 3 nm before SANDY (a reporting point).

11:55:27 The TWR instructed the Aircraft A to continue its approach to runway 16 and informed that the wind was 340° at 4 kt.

About 11:57 An aircraft which was flying before the approaching Aircraft A (hereinafter referred to as “the Aircraft C”) landed on runway 16.

11:57:07 The Aircraft B requested a taxiing to the GND. The GND instructed the Aircraft B to taxi to the runway 16 via taxiway E2 (hereinafter referred to as “E2”).

11:57:24 The Aircraft A flew over the outer marker (OM). The Aircraft B had started taxiing after completing the pushback from Spot 8.

11:57:48 The TWR issued a landing clearance for runway 16 to the Aircraft A and informed that the wind was 340° at 3 kt. The Aircraft A was about 4.4 nm from runway 16 threshold at that time.

11:57:53 The Aircraft A read back the landing clearance for runway 16.

11:58:32 The GND instructed the Aircraft B to contact with the TWR. The Aircraft B read it back.

11:58:43 The Aircraft B reported that it was ready for departure to the TWR. The Aircraft B was about to enter the E2 from taxiway A2 (hereinafter referred to as “A2”) at that time.

11:58:47 The TWR notified wind-related information to the Aircraft B and issued a take-off clearance from runway 16. The Aircraft B read it back.
The Aircraft A was about 2.3 nm from runway 16 threshold at that time.

11:59:00 The Aircraft A confirmed the landing clearance for runway 16 with the TWR

11:59:05 The TWR instructed a go-around to the Aircraft A. The Aircraft A was about 1.7 nm from runway 16 approach ends at that time. Meanwhile, the Aircraft B was short of the holding position marking (hereinafter referred to as “the Holdline”) of E2.

11:59:10 The TWR canceled the take-off clearance for the Aircraft B and instructed it to line up and wait. The Aircraft B read it back.

2.1.2 Statements of Flight Crewmembers

(1) PIC of the Aircraft A

When the Aircraft A was approaching to runway 16 under radar vectoring by the Fukuoka approach control, the Aircraft C was flying about 7 to 8 nm ahead.

The landing checklist must be usually completed by the time when the aircraft reaches about 1,000 ft. An item at the end of the checklist is related to a landing clearance.

The PIC of the Aircraft A (hereinafter referred to as “the PIC A”) was uncertain as to whether a landing clearance had been received for the aircraft. Therefore, the PIC tried to confirm with the FO. At this time, the PIC heard a communication “Cleared for take-off.”

When the communication was heard, the PIC A was visually confirming the

runway and an aircraft on a taxiway. But the aircraft appeared to have stopped and there was no sign of its moving. Because a white anti-collision light (hereinafter referred to as “the strobe light”) was not illuminated, either, the PIC A surmised that the take-off clearance had been provided for a helicopter. However, because he was concerned about whether a landing clearance had been obtained for the aircraft itself, the PIC made the FO confirm this point. The PIC A was expecting either of “Continue approach” instructions or a “Cleared to land” clearance to be provided by the TWR, but because a go-around was instructed, the PIC A performed a go-around while thinking about the reason.

As far as the weather condition at that time is concerned, the ceiling was about 3,000 to 4,000 ft. Rain was falling occasionally, and visibility was not good. The PIC A felt that it was fluctuating between the visual meteorological conditions (VMC) and the instrument meteorological conditions (IMC). However, when the PIC A heard the communication “Cleared for take-off,” the runway was visible as the altitude was probably 700 to 800 ft.

(2) FO of the Aircraft A

When the Aircraft A passed over the OM in approaching runway 16 of Fukuoka Airport, the landing checklist had been completed. An item at the end of the checklist is related to a landing clearance, and it calls for mutually confirming a clearance between a PIC and an FO. Therefore, the FO of the Aircraft A (hereinafter referred to as “the FO A”) tried to confirm a landing clearance with the PIC, but the FO A had no clear memories of which one of “Continue approach” and “Cleared to land” had been obtained from the controller, and felt unsure about whether a landing clearance had been actually obtained. At that time, the FO A heard a communication “Cleared for take-off” for another aircraft, but did not know which aircraft was involved. At the same time, the FO A was instructed by the PIC A, “Just confirm a landing clearance”, and when the FO A confirmed with the controller, the Aircraft A was instructed to perform a go-around.

The FO A visibly recognized the runway at about 900 ft and confirmed that there were no aircraft on the runway.

(3) PIC of the Aircraft B

It was 11:53 when the Aircraft B started pushback from Spot 8 for taxiing.

Soon after the FO of the Aircraft B reported “Ready” to the TWR, a take-off clearance “Runway 16, cleared for take-off” was issued. The position of the Aircraft B was just before the Holdline on the E2.

The PIC of the Aircraft B (hereinafter referred to as “the PIC B”) checked the final approach course (hereinafter referred to as “the Final”) after receiving the take-off clearance, but because visibility was very poor as the prevailing visibility of 6 km and the runway visual range (RVR) of 1,600 m, the Aircraft A was not visibly recognized. After that, when the Aircraft B crossed the Holdline and slightly entered the runway, the PIC B monitored a communication “Confirm cleared to land” and got shocked to hear the word. Then, when the PIC B looked at the Final, the Aircraft A was recognized there. At that time, the controller instructed the Aircraft A to perform a go-around and then, instructed the Aircraft B, “Cancel departure clearance” and “Line up and wait”. The Aircraft A soon disappeared, probably because it entered the clouds. A little later, a take-off clearance “Cleared for take-off” was issued again and then the

Aircraft B took off.

Usually, after receiving a take-off clearance, crewmembers first confirm both whether there is no aircraft in the Final and whether there is no other aircraft on the runway and then confirm whether the runway is exactly the permitted one and after that, the aircraft enters the runway.

When “Line up and wait” instructions was given, an aircraft must illuminate its strobe light in order to let it known to other aircraft, before entering the runway from a taxiway. Because the Aircraft A seemed to be in the clouds, the PIC B was not certain whether the strobe light had been visibly confirmed by the Aircraft A. When the take-off clearance was obtained, the Aircraft B was short of the Holdline. Because the PIC B had to perform the checklist after reading back the take-off clearance, the PIC B thinks that the strobe light had already been illuminated slightly short of the Holdline.

Because the Aircraft A performed a go-around at an early stage, the PIC B did not feel any impending danger.

(4) FO of the Aircraft B

The FO of the Aircraft B (hereinafter referred to as “the FO B”), reported “Ready” to the TWR, after finishing the check of the flight control system. Because the Aircraft B received a take-off clearance “Cleared for take-off,” it continued to taxi toward runway 16. At that time, when the FO B checked the Final, any aircraft was not seen because of bad weather.

While the Aircraft B was taxiing toward the runway, a communication “Confirm cleared to land” from another aircraft was heard, and because the TWR instructed this aircraft to perform a go-around, the FO B felt something unusual and looked at the Final, and then the FO B visually recognized the aircraft.

The TWR instructed the Aircraft B “Cancel take-off clearance” and “Line up and wait,” consequently the Aircraft B read it back and waited on the runway.

2.1.3 Statements of Controllers

(1) The TWR

The TWR took a seat at the aerodrome control position at about 11:20. Visibility was poor and after a while, the meteorological condition became the IMC, and visibility became about 4,000 m. The RVR fell as low as 1,200 m.

Four to five arrival aircraft had been entering the airport with about 7 nm intervals and the Aircraft A was on the tail end. There were no arrival aircraft for a while after that and there was no departure aircraft other than the Aircraft B.

Traffic volume for the day was not particularly busy compared to normal. But the RVR fluctuated, the TWR felt that the workload for the day was heavier because there was necessary to provide information to the aircraft concerned on each occasion. Because the meteorological condition became the VMC before the occurrence of this serious incident, the TWR felt a pause.

Around this time, flight data position controller (hereinafter referred to as “the FD”) received the report that traces of bird strike had been found on an aircraft which arrived at Haneda Airport from Fukuoka Airport. As a result, it was decided to inspect the runway at Fukuoka Airport. After related matters were coordinated between the GND and the FD; therefore, a runway inspection vehicle was going southward on the

taxiway A. The TWR had been concerned about the timing for starting the runway inspection.

Because the Aircraft C exited from the runway, the TWR issued a landing clearance to the Aircraft A. After a while, communication with the Aircraft B which had been before the E2 was transferred from the GND to the TWR. When the Aircraft B reported “Ready,” the TWR instantly gave a look at the Aircraft B and after that, found nothing in the Final, and then issued a departure clearance as it was. At that time, the TWR had completely forgotten about the existence of the Aircraft A.

While following the usual confirmation process in which the Tower Bright Display (hereinafter referred to as “the BD”) and the runway shall be checked in that order, the TWR must have checked the BD, but the TWR missed the existence of the Aircraft A, which was believed to have been displayed there.

Soon after the Aircraft B read back the take-off clearance, the Aircraft A requested the TWR to confirm the landing clearance for the aircraft. As a result, the TWR came to realize the existence of the Aircraft A. But the TWR could not visibly recognize the Aircraft A on the Final at that time, though it is unknown whether this was due to the weather condition or the size of the aircraft.

When the TWR checked the BD once again, the Aircraft A was on display there. At this time, the TWR saw the Aircraft B coming very close to the Holdline of E2. Judging that it would be difficult for the Aircraft B to stop before the line, the TWR instructed the Aircraft A to perform a go-around. And then, the TWR canceled the take-off clearance for the Aircraft B and instructed it to line up and wait. At this time, the TWR could visibly recognize the Aircraft A clearly.

An ATC strip*¹ (hereinafter referred to as “Strip”) for departure aircraft is placed at the ground control position when the GND is on duty. When the TWR issued a landing clearance to the Aircraft A, the Strip for departure aircraft had not delivered at the TWR; therefore, the TWR had not been aware of the Aircraft B (a departure aircraft) until the time when the Strip was delivered. On the contrary, no Strip was used for arrival aircraft; accordingly, the existence of arrival aircraft was checked by looking at the BD.

The specific procedure for handling inbound and outbound flights can change, depending on the wind direction and the type of aircraft, but if a departure aircraft completes preparations for take-off before an arrival aircraft flies over the OM, the departure aircraft may be allowed to take off ahead of the arrival aircraft under a standard adopted at the airport.

Arrival Aircraft Strip (Printed in red)

Call sign	Discrete Beacon Code	Destination Airport	Altitude			
Type of Aircraft	Approach point	Estimated arrival time				
Aircraft No.				Departure Airport	Output Time and Date	

*¹ An ATC strip is a slip providing various kinds of aircraft-related printed information needed for controllers to conduct air traffic control services. It is also called a flight progress strip.

(Sample)

JAC9876	3434	RJFF	150			
DH8D/M	OMUTA	0234		R15		
2468/S				TAIME	JFM 110510-0204	

Although there is no clear rule, radio communication is transferred to the TWR from the GND when a taxiing aircraft has come close to runway 16 threshold.

(2) The GND (Trainee)

Because a notice of bird strike was given, the GND (Trainee) had been informed by the FD that a runway inspection vehicle would go southward on taxiway A from around Spot 16. Since the Aircraft C was to arrive at Spot 22, the GND (Trainee) was thinking about the timing for letting the runway inspection vehicle go southward.

When the Aircraft B spotted out, the GND (Trainee) recognized the Aircraft A on the BD and felt that the separation between the Aircraft A and the Aircraft C was not so large.

When the Aircraft C landed, the Aircraft B was taxiing out from Spot 8.

The situation was that the Aircraft B started taxiing and there was no departure aircraft before the Aircraft B. The GND (Trainee) transferred radio communication for the Aircraft B to the TWR before it enters the E2.

After transferring radio communication for the Aircraft B to the TWR, the GND (Trainee) had been concerned about the movements of a departure aircraft on an international flight and the vehicle to be mobilized for runway inspection.

Because the Aircraft C was to arrive at Spot 22, the GND (Trainee) had instructed the runway inspection vehicle to go southward on taxiway A to around Spot 20.

Later, because the Aircraft C arrived at Spot 22 without delay, the GND (Trainee) instructed the runway inspection vehicle to go southward on taxiway A to taxiway E12. This serious incident occurred when the runway inspection vehicle was going toward taxiway E12. The GND (Trainee) had not been aware of the position of the Aircraft B at that time.

(3) The GND (Instructor)

Because traces of bird strike were found on an aircraft at Haneda Airport, it was also decided to inspect the runway at Fukuoka Airport as the departure aerodrome of the aircraft involved. Being informed that flight information officer had mobilized a runway inspection vehicle before the departure of the Aircraft B, the GND (Instructor) had become fairly nervous about what to do with the situation.

A regular runway inspection is usually made when traffic is not busy. But the runway inspection vehicle was mobilized earlier than usual on the day following the report about the bird strike.

The GND (Instructor) hoped to talk with the TWR about what to do with the runway inspection vehicle after the Aircraft C exits from the runway. Therefore, the instructor thinks that when the serious incident occurred, much attention had been paid to the runway inspection vehicle in the GND's mind.

Within the control tower, controller basically let radio communication come from speakers for the purpose of sharing necessary information. The speaker volume is tuned

so that there is no influence on personnel at other positions.

The handling of arrival aircraft and departure aircraft is not usually coordinated between a GND and a TWR. A TWR independently decides on the orders for handling outbound and inbound flights, such as whether to let a departure aircraft take off in an interval between arrival aircraft.

When runway 16 is used, controller have very much difficulty in deciding the orders for handling outbound and inbound flights, because the taxiway to be used is located on apron and also because there are many departure aircraft.

When the serious incident occurred, the GND was in communication with two to three departure aircraft, one arrival aircraft and two to three aircraft planned to start taxiing for departure as well as the runway inspection vehicle.

(4) The FD

The FD is mainly in charge of coordination with an ATC clearance delivery controller and a radar controller as well as a GND and a TWR. The FD also coordinates with a flight information officer.

The FD had recognized on the BD that there were two arrival aircraft, including the Aircraft A, and that there would be no arrivals after these aircraft for a while. The FD had confirmed that several departure aircraft strips had been in place and thought that coordination had to be made for the runway inspection with the GND and the TWR.

When the FD looked at the Final, any aircraft could not be found immediately. But the Aircraft A came into sight at the same time when the instructions “Go around” were heard. At the very moment when the FD looked at the runway to confirm what had become an obstacle, the nose of the Aircraft B was about to cross the Holdline on the way from the E2 to the runway.

This serious incident occurred at about 11:59 on May 10, 2011 and the location was about 1.7 nm (about 3 km) from the threshold on the final approach course to runway 16 of Fukuoka Airport. (See Figure 1 Estimated Flight Route of the Aircraft A, Figure 2 Estimated Taxiing Route of the Aircraft B, Figure 3 Estimated Traffic Condition in Area Concerned at the Aerodrome at the Time of the Occurrence of the Serious Incident, Figure 4 Three Angle View of Bombardier DHC-8-402, Figure 5 Three Angle View of Boeing 767-300, Photo 1 Scene of the Control Tower and The Runway, Attachment 1 ATC Communication)

2.2 Injuries to Persons

No one was injured.

2.3 Damage to the Aircraft

There was no damage to both aircraft.

2.4 Personnel Information

(1) PIC of the Aircraft A	Male, Age 52	
Airline Transport Pilot Certificate (Airplane)		August 12, 2009
Type Rating for Bombardier DHC-8		October 8, 2010
Class 1 Aviation Medical Certificate		

Validity	October 9, 2011
Total flight time	15,598 h 33 min
Flight time in the last 30 days	45 h 34 min
Total flight time on the type of aircraft	317 h 44 min
Flight time in the last 30 days on the type of aircraft	45 h 34 min
(2) FO of the Aircraft A	Male, Age 28
Commercial Pilot Certificate (Airplane)	October 6, 2008
Type Rating for Bombardier DHC-8	November 24, 2009
Instrument Flight Certificate	October 8, 2008
Class 1 Aviation Medical Certificate	
Validity	January 13, 2012
Total flight time	1,118 h 34 min
Flight time in the last 30 days	59 h 20 min
Total flight time on the type of aircraft	859 h 39 min
Flight time in the last 30 days on the type of aircraft	59 h 20 min
(3) PIC of the Aircraft B	Male, Age 54
Airline Transport Pilot Certificate (Airplane)	September 15, 2009
Type Rating for Boeing 767	December 21, 1989
Class 1 Aviation Medical Certificate	
Validity	September 5, 2011
Total flight time	12,863 h 24 min
Flight time in the last 30 days	35 h 15 min
Total flight time on the type of aircraft	9,964 h 59 min
Flight time in the last 30 days on the type of aircraft	35 h 15 min
(4) FO of the Aircraft B	Male, Age 28
Commercial Pilot Certificate (Airplane)	January 26, 2006
Type Rating for Boeing 767	January 9, 2008
Instrument Flight Certificate	January 27, 2006
Class 1 Aviation Medical Certificate	
Validity	November 26, 2011
Total flight time	2,201 h 14 min
Flight time in the last 30 days	46 h 24 min
Total flight time on the type of aircraft	1,961 h 54 min
Flight time in the last 30 days on the type of aircraft	46 h 24 min

2.5 Air Traffic Controllers

(1) The TWR	Male, Age 40
Air Traffic Controller Qualification Certificate	
Aerodrome control services	June 6, 2002
Approach control services	November 27, 2002
Terminal radar control services	January 31, 2003
En route air traffic control services	October 1, 1996
En route approach control services	October 1, 1996
Radar area control services	November 10, 1997
Medical Certificate	

Validity	June 30, 2011
Aviation English Language Proficiency Certificate	
Validity	March 4, 2013
(2) The GND (Trainee) Male, Age 32	
Air Traffic Controller Qualification Certificate	
Aerodrome control services	April 2, 2009
Approach control services	May 1, 2009
Terminal radar control services	May 1, 2009
En route air traffic control services	October 1, 2000
En route approach control services	October 1, 2000
Radar area control services	February 12, 2002
Medical Certificate	
Validity	June 30, 2011
Aviation English language Proficiency Certificate	
Validity	March 4, 2012
(3) Instructor of the GND Male, Age 39	
Air Traffic Controller Qualification Certificate	
Aerodrome control services	February 19, 2001
Ground controlled approach services	July 30, 2001
Approach control services	March 4, 2005
Terminal radar control services	March 29, 2005
En route air traffic control services	October 1, 1992
En route approach control services	October 1, 1992
Radar area control services	November 1, 1993
Medical Certificate	
Validity	June 30, 2011
Aviation English Language Proficiency Certificate	
Validity	March 4, 2014
(4) The FD Male, Age 48	
Air Traffic Controller Qualification Certificate	
Aerodrome control services	October 1, 1983
Approach control services	December 1, 1984
Terminal radar control services	June 1, 1985
Ground controlled approach services	December 1, 1985
En route air traffic control services	December 1, 1991
En route approach control services	December 1, 1991
Radar area control services	July 1, 1992
Medical Certificate	
Validity	June 30, 2011
Aviation English Language Proficiency Certificate	
Validity	April 27, 2013

2.6 Meteorological Information

Aerodrome routine meteorological reports for Fukuoka Airport around the time of the serious incident were as follows:

11:33	Wind direction	310°,	Wind velocity	3 kt,	Visibility	6 km	
	Runway visual range,	Runway 16	Runway touchdown zone	1,600 m	Upward		
			Runway end	1,700 m	Upward		
	Shower rain						
	Cloud: Amount	FEW,	Type	Stratus,	Ceiling	1,000 ft	
		Amount	BKN,	Type	Cumulus,	Ceiling	2,500 ft
	Temperature	24 °C,	Dew point	22 °C			
	Altimeter setting (QNH) 29.78 inHg						
12:00	Wind direction	330°,	Wind velocity	4 kt,	Wind fluctuation	290° to 030°	
	Visibility	6 km,	Shower rain				
	Cloud: Amount	FEW,	Type	Stratus,	Ceiling	800 ft	
		Amount	SCT,	Type	Stratus,	Ceiling	1,000 ft
		Amount	BKN,	Type	Cumulus,	Ceiling	2,500 ft
	Temperature	24 °C,	Dew point	22 °C			
	Altimeter setting (QNH) 29.78 inHg						

2.7 Information on DFDRs and Cockpit Voice Recorders

The Aircraft A had been equipped with a DFDR (part number: 980-4700-027) and a cockpit voice recorder (CVR) (part number: 980-6022-011) made by Honeywell of the United States of America, while the Aircraft B had been equipped with a DFDR (part number: 10077A500) and a CVR made by Lockheed Aircraft Service of the United States of America. It was already known that the data of the Aircraft B's CVR (with a maximum recording period of two hours) had been overwritten as the aircraft continued several legs of flight after the occurrence of this serious incident; therefore, the CVR was not removed from the aircraft.

The records at the time when the serious incident occurred were retained on the Aircraft A's DFDR. But the data of its CVR (with a maximum recording period of two hours) had been overwritten, because the aircraft continued several legs of flight after the serious incident. Therefore, the records at the time of the serious incident were not retained.

Because the data of the Aircraft B's DFDR (part number: 10077A500) was unable to read correctly at the time of this serious incident, QAR data were used for an analysis of the condition of the Aircraft B when it was taxiing.

Meanwhile, the time of the Aircraft A's DFDR and the Aircraft B's QAR was determined by correlating the DFDR and QAR recorded VHF transmission keying signals with the time signals recorded on the ATC communication records.

2.8 Information regarding the Place Where the Serious Incident Occurred

(1) Runway and taxiway

Fukuoka Airport has an elevation of 9.1 m and has a runway (16/34) with a length of 2,800 m and a width of 60 m. On the east side of the runway is a domestic terminal, while there is an international terminal on the west side of the runway. Because the domestic terminal is near the east side of runway 16 end to the north, the distance is short from the apron to runway 16 end. Therefore, the aircraft reaches runway 16 end soon after it starts taxiing. Departure aircraft for international flight are sometimes instructed to detour and cross the runway before taking off, in order to avoid an adverse influence on radio waves for the instrument landing system (ILS) in bad weather.

(2) Assignment of Controllers

On the day when the serious incident occurred, seven controllers were on duty at the Control Tower. Five of them were seated at the ATC clearance delivery position, the FD position, the GND position, the TWR position and the DO position. One person was standing by, while one trainee sat at the GND position.

(See Photo 1 Layout of the Control Tower and View of the Runway)

(3) Introduction of Runway Status Light System (RWSL)

Because there were several runway incursions in 2007, the Civil Aviation Bureau, the Ministry of Land, Infrastructure, Transport and Tourism and civil aviation-related entities with cooperate and work well together, decided to discuss measures such as system development, including both software and hardware, to prevent occurrences. Specifically, discussion was made at a study group about measures for the prevention of runway incursions, and it was agreed to introduce the RWSL as a visual support system for pilots.

The RWSL is a system designed to issue a warning by lighting, when a runway is occupied by an aircraft or a vehicle or another aircraft about to take off or an aircraft or a vehicle about to cross the runway. The RWSL consists of two lighting systems—the runway entrance lights (RELs) and the take-off hold lights (THLs).

The RELs are installed at near the centerline of the taxiway which intersects with the runway, and it is illuminated when an approaching aircraft reaches a point with a designated distance from the runway threshold or when the speed of departure aircraft on the runway exceeds a designated level.

The THLs are installed at ahead of the take-off roll starting point on the runway and it is illuminated when there is an aircraft at the departure holding position and there is another moving object (an aircraft or a vehicle) on the runway, and when it was recognized with an RWSL logic that the moving object at the holding position is a lined-up departure aircraft.

The RWSL, when illuminated, indicates that the runway involved is occupied, and this does not mean any clearance by a controller. In other words, a green light is not used for the RWSL; on the contrary, it is controlled only by lightning-up or lightning-down of red lights.

The RWSL processor uses target information obtained from a monitoring system which employs multilateration*² and other technologies to determine when to activate and deactivate the RELs and THLs.

If the RELs is set to be illuminated when an approaching aircraft reaches a point 2 nm from the runway threshold, when the Aircraft B is on the E2, as was the case with this serious incident, the red lights will be illuminated for the Aircraft B because the Aircraft A comes within 2 nm from runway 16 threshold.

According to a plan to introduce the RWSL at Fukuoka Airport, the RELs were to be installed in fiscal year 2011, while the THLs are scheduled to be established after the end of work for overlying the runway base in fiscal year 2012.

2.9 Details Concerning Use of Strips for IFR Arrival Aircraft at Fukuoka Aerodrome

*² Multilateration is a technology for a monitoring system designed to locate an aircraft's whereabouts by receiving radio signals sent out from the aircraft at three or more stations and calculating the difference in the data receiving times.

Control Tower

Details of discussions during operations planning meetings of controllers were as follows:

- (1) After a series of ATC-related troubles occurred at another airport in late March of 2009, the Air Traffic Control Division of the Civil Aviation Bureau issued instructions to all ATC service organizations to consider measures to prevent similar incidents. In response to this, from the point of view of preventing human errors and reducing risk, the Fukuoka Aerodrome Control Tower started using an arrival aircraft strip in May 2009 as a reminder system (hereinafter referred to as “the Reminder”) for those at the aerodrome control position so that they do not forget the existence of arrival aircraft.
- (2) The effectiveness of the measure mentioned above in (1) was assessed a few times. But views about the use of the arrival aircraft strip differed from controller to controller as of October 2009. Actual responses also differed. There were some skeptical views about the initiative itself. There was also an opinion that controllers may become less attentive about watching the outside situation if they have to see the strip. Therefore, it made the meeting start to consider the possibility of discontinuing the use of the strip.
- (3) In a regular safety oversight conducted in November 2009, the use of the arrival aircraft strip as the “Reminder” was considered effective to some extent. As a result, the meeting decided to continue using the strip.
- (4) In October 2010, specifically how to use the arrival aircraft strip had varied widely among some teams or controllers. As the unevenness in the use of the strip caused no small influence on ATC operations and team operations, a consideration was started toward discontinuing the use of the strip.
- (5) In December 2010, a consensus was not obtained among the controllers as a whole about the use of the arrival aircraft strip. Because there was no way to clear the fear, which had been expressed from the beginning, that the watching the outside situation may be carelessly done if controllers have to see the strip, it was decided to discontinue the use of the strip, by concluding more efforts must be made to improve the monitoring of the situation outside rather than enhancing the effectiveness of the arrival aircraft strip as the Reminder. But the printout of the arrival aircraft strip was continued through the middle of January 2011, as a tentative measure until the time when the use of strip was completely discontinued.
- (6) When this serious incident occurred, the departure aircraft strip was in use at the aerodrome control position. But an arrival aircraft strip had not been used.

2.10 Additional Information

2.10.1 Take-off clearance and landing clearance

Following descriptions concerning the take-off clearance and landing clearance are included in (III) the Aerodrome Control Procedure, 2 ATC Clearance and Others, within Chapter III "ATC Operational Procedure" of the ATC Service Regulation (hereinafter referred to as “the ATC Operational Procedure”) prescribed by the Civil Aviation Bureau: (Excerpts)

“Take-off Clearance”

- (1) a. *A take-off clearance shall be issued under the following procedures, basically when the departure aircraft comes close to the runway for take-off (for a piston engine aircraft, upon the receipt of a report of the completion of take-off preparations), and after the preceding aircraft involved (Omitted) has reached a designated position. However,*

when it was judged that by the time when the aircraft involved starts a take-off rolling, a designated separation can be established between the aircraft and the preceding aircraft (Omitted), the controller can issue a take-off clearance for the aircraft involved after providing necessary traffic information, even before the preceding aircraft reaches the designated position. In this case, the preceding departure aircraft must go through the longitudinal central part of the runway for use.

- b. After a take-off clearance was issued, the controller cannot allow other aircraft which use the same runway to take off, line up and taxi on the runway, and cross the runway, ahead of the departure aircraft involved.*

“Cancellation of Take-off Clearance”

- (7) a. In cases when a take-off clearance has to be canceled due to the air traffic condition and other reasons, the controller must issue alternative instructions and then, the take-off clearance earlier issued shall be canceled. In this case, the reason for the cancellation shall be informed to the aircraft involved as much as possible.*

“Landing Clearance”

- (8) a. A landing clearance (including clearance for low approach, touch-and-go, stop-and-go and optional approach, hereinafter in the same manner) shall be issued without delay under the following procedure, after the preceding aircraft involved (Omitted) has reached a designated position, or when it was judged that a designated separation can be established between the aircraft involved and the preceding aircraft (Omitted). When the controller will issue a landing clearance before the preceding aircraft reaches a designated position, the traffic information about the preceding aircraft involved shall be provided and the preceding departure aircraft cannot be allowed to start a take-off rolling from the same runway or any intersecting runway.*
- c. After a landing clearance was issued, the controller cannot allow other aircraft which use the same runway to take off, line up and taxi on the runway, and cross the runway, ahead of the arrival aircraft involved.*
- d. Regardless of the timing for issuing a landing clearance, if it was judged that an enough separation cannot be established on the runway at the time when the arrival aircraft flies over the runway approach end, the controller shall instruct a go-around.*

“Instructions for Go-Around”

- (10) When it was judged that the arrival aircraft cannot continue an approach safely because of the condition of the runway, the air traffic condition and other reasons, the controller shall instruct the aircraft involved to perform a go-around. Instructions for the aircraft about its flight rule from then on shall be issued at an appropriate time.*

2.10.2 BD

Regarding the tower bright display, following descriptions are included in (III), 10 in the ATC Operational Procedure:

Application

- (1) The tower bright display (hereinafter referred to as “the Bright”) can be used when the whereabouts of aircraft flying in the control zone and surrounding areas must be confirmed and necessary information must be provided to these aircraft and at the same time, when this can be judged to be necessary for performing ATC services.*

(Note) The confirmation of the whereabouts of an aircraft by the Bright is unrelated to

radar identification stipulated in (IV) the standards for the use of radar. The service stipulated in this paragraph is not a radar service.

3. ANALYSIS

3.1 Airman Competence Certificate and Others

The PIC and the FO of the Aircraft A as well as the PIC and the FO of the Aircraft B had held both valid airman competence certificates and valid aviation medical certificates.

3.2 Air Traffic Controller Competence Certificate and Others

The TWR had held a valid air traffic controller qualification certificate, a valid medical certificate and a valid aviation English language proficiency certificate.

3.3 Relation to Meteorological Phenomena

According to the statements of the crewmembers and the controllers described in 2.1.2 and 2.1.3 as well as the aerodrome routine meteorological reports described in 2.6, it is considered probable that the meteorological condition at the time of the occurrence of this serious incident was bad with poor visibility on the Final poor due to shower rain.

3.4 Situations of the Aircraft Involved

3.4.1 The Aircraft A and the Aircraft B's Close Approach to Each Other

It is highly probable that, as described in 2.1.1, the situation in which the Aircraft A and the Aircraft B had come close to each other was as below.

- | | |
|----------|---|
| 11:57:24 | The Aircraft A was above the OM, while the Aircraft B had started taxiing on taxiway A2 after completing the pushback from Spot 8. |
| 11:57:48 | The Aircraft A was about 4.4 nm from runway 16 threshold, while the Aircraft B was taxiing on A2 toward E2. |
| 11:58:47 | The Aircraft A was about 2.3 nm from runway 16 threshold, while the Aircraft B was taxiing toward E2 from A2. |
| 11:59:05 | When the controller instructed the Aircraft A to perform a go-around, the Aircraft A was about 1.7 nm from runway 16 threshold, while the Aircraft B was short of the Holdline of E2. |

3.4.2 Situation of the Aircraft A

- (1) According to the descriptions in 2.1.1 and the statements described in 2.1.3 (1) and (4), the Aircraft B had not crossed the Holdline of E2 as of 11:59:05 when the TWR instructed the Aircraft A to perform a go-around. However, according to the statement described in 2.1.2 (4), the Aircraft B continued to taxi toward runway 16. Therefore, it is highly probable that the Aircraft B had crossed the Holdline of E2 just after the instructions of a go-around for the Aircraft A.
- (2) As described in 2.1.1, it is considered highly probable that after flying over the OM at 11:57:24, the Aircraft A received a landing clearance at a point about 4.4 nm from runway 16 threshold at 11:57:48. It is highly probable that about one minute later, the PIC A and the FO A heard the "Cleared for take-off" as take-off clearance issued by the TWR for the

Aircraft B, when the Aircraft A was about 2.3 nm from runway 16 threshold.

The PIC A and the FO A were uncertain about whether the aircraft had already received a landing clearance, when they completed the landing checklist. Therefore, it is probable that they had asked the TWR to confirm a landing clearance, when the Aircraft A was about 1.8 nm from runway 16 threshold. According to the statements described in 2.1.2 (1) and (2), it is probable that this does not mean that they came to realize the unusual situation in which a take-off clearance has been issued for another aircraft despite the landing clearance already issued for their aircraft, or that the two persons asked for confirming the landing clearance because they visibly recognized the Aircraft B on the runway.

3.4.3 Situation of the Aircraft B

- (1) According to the description in 2.1.1 and the statements described in 2.1.2 (3) and (4), it is probable that, the Aircraft B requested the GND to approve taxiing after a pushback from Spot 8, the request for taxiing to runway 16 was approved, and while taxiing, the aircraft completed checking the condition of its flight control system, and then the communication with the aircraft was transferred to the TWR from the GND.

It is probable that when the Aircraft B reported “Ready” to the TWR, its take-off was approved and while confirming the Final and the runway for use, the aircraft continued to taxi toward runway 16.

According to the statements in 2.1.2 (3) and (4) and the descriptions in 2.6, visibility on the Final at this time was poor due to shower rain. Therefore, it is probable that the Aircraft B could not visibly recognize the Aircraft A until just before it entered the runway.

- (2) As described in 2.1.1, the Aircraft A had already received a landing clearance from the TWR before the communication with the Aircraft B was transferred to the TWR from the GND. Therefore, it is probable that it was unable for the Aircraft B to recognize the existence of the Aircraft A on the Final by monitoring ATC communication. It is probable that the Aircraft B came to recognize the existence of the Aircraft A only when the aircraft heard the communication “Confirm cleared to land” from the Aircraft A, and then visibly recognized the Aircraft A on the Final.

3.5 Situation of the Controllers

3.5.1 Tower

- (1) As described in 3.3, when the TWR checked the Final to issue a take-off clearance for the Aircraft B, visibility in the direction to the Final was poor due to shower rain. Therefore, it is probable that the TWR could not visibly recognize the Aircraft A.
- (2) According to the statement described in 2.1.3 (1), the TWR must have checked the BD in the usual confirmation process, in which the Final, the BD and the runway involved shall be checked in that order. The TWR could have checked the BD but missed the existence of the Aircraft A.

Therefore, it is probable that because the TWR failed to check thoroughly whether an arrival aircraft was displayed on the BD in the confirmation process, he misunderstood that there was no aircraft in the Final and issued a take-off clearance for the Aircraft B.

- (3) According to the statement described in 2.1.3 (1), because the runway inspection vehicle was sent out, the TWR had been concerned about the timing for starting the runway inspection.

Therefore, it is somewhat likely that after issuing a landing clearance for the Aircraft A, the TWR had forgotten the existence of the Aircraft A while becoming occupied with the timing and the method for the runway inspection as well as the movements of other related aircraft.

- (4) According to the statement described in 2.1.3 (1), when the TWR issued a landing clearance for the Aircraft A, the Strip regarding the Aircraft B (Departure aircraft) had not yet been received by him. Therefore, it is probable that because the TWR understood that there was no departure aircraft before the landing of the Aircraft A and also because the Aircraft C had already exited from the runway, he issued the landing clearance for the Aircraft A at an earlier time than in the case where there is a preceding departure aircraft.

According to the ATC communication records, after the TWR processed the arrival of four to five aircraft at 7nm intervals, there was no communication with other aircraft for one minute until he issued the take-off clearance for the Aircraft B, from issued the landing clearance for the Aircraft A.

It is somewhat likely that because the TWR felt a pause after processing the series of arrival aircraft and a certain period of time had lapsed after he issued the landing clearance for the Aircraft A at an early time, his attentiveness had declined at the time of the incident. It is probable that because he received a call from the Aircraft B at that time, he forgot the existence of the Aircraft A; as a result, issued the take-off clearance for the Aircraft B.

- (5) Because Spot 8 where the Aircraft B had parked is close to runway 16 end, the distance for taxiing is short and as a result, communication with the aircraft involved will not be transferred until it comes just short of E2. Therefore, it is probable that when the TWR realized the existence of the Aircraft A, the TWR could not stop the Aircraft B before the runway.

3.5.2 Coordination of Controllers

- (1) According to the statement described in 2.1.3 (2), the GND (Trainee) had recognized the existence of an arrival aircraft on the BD when the Aircraft B spotted out. Therefore, it is probable that the GND (Trainee) had been aware of the existence of the Aircraft A. However, after the GND (Trainee) transferred communication with the Aircraft B to the TWR, he was concerned about a departure aircraft for an international flight and the movement of the vehicle mobilized for runway inspection. Therefore, it is probable that when the TWR issued the take-off clearance for the Aircraft B, the GND (Trainee) could not remind the TWR of the existence of the arrival aircraft.
- (2) According to the statement described in 2.1.3 (4), the FD had recognized on the BD that there were two arrival aircraft, including the Aircraft A, and that there would be no arrivals after these aircraft for a while. Therefore, it is probable that the FD had recognized the existence of the Aircraft A by checking the BD. However, he understood that coordination had to be made about the timing for the runway inspection with the GND and the TWR. Therefore, it is probable that because he had been preoccupied with

the runway inspection, he could not remind the TWR of the existence of the arrival aircraft when the TWR issued the take-off clearance for the Aircraft B.

- (3) According to the statement described in 2.1.3 (3), Instructor of the GND (Instructor) stated that, within the control tower, controllers basically let radio communication come from speakers for the purpose of sharing necessary information. Therefore, it is probable that the GND (Instructor) had been always performing his jobs while paying attention to other controllers. But because the controllers within the control tower perform their own jobs independently in their positions, it is probable that it is difficult to always monitor the work of other position's controller.

Other controllers who were working at the control tower had not been aware of the fact that the TWR had issued a take-off clearance for the Aircraft B. Therefore, it is probable that though the controllers were trying to check each other's work by mutually hearing the radio communication, this did not work well and as a result, other controllers could not remind the TWR of the existence of the arrival aircraft.

3.5.3 Use of Strips for IFR Arrival Aircraft

As described in 2.9, it had been decided to use Strips for IFR arrival aircraft as the Reminder at the Fukuoka Aerodrome Control Tower. But criticisms were made that the use of the Strip would adversely affect such work as the monitoring of the situation outside. As a result, it is probable that a consensus about the use of the Strip could not be obtained among the controllers and the use of the arrival aircraft strip had been discontinued.

It is probable that an alternative measure had to be taken when discontinuing the use of the Reminder which had been worked out to ensure controllers do not forget the existence of arrival aircraft. It is somewhat likely that if a similar system such as the arrival aircraft strip was continuously used, this serious incident would have been avoided.

3.6 Severity of This Serious Incident

As described in 2.1.1, the distance between the Aircraft A and the Aircraft B was about 1.7 nm (about 3 km) when the TWR instructed the Aircraft A to perform a go-around.

In classifying the severity of this serious incident in line with the Manual on the Prevention of Runway Incursions (Doc9870) published by the International Civil Aviation Organization (ICAO), this report has used a program provided by ICAO. As a result, it is certain that this occurrence can be classified as "An incident characterized by ample time and/or distance to avoid a collision." as stipulated in C on the Table for the Severity Classification Scheme in the Manual.

(See Attachment 2 Severity Classification Scheme)

3.7 Preventive Measures to be taken

- (1) It is highly probable that this serious incident had occurred because of poor visibility, failing to check thoroughly in the confirmation process and so on. However, because there are limitations in the ability and attentiveness of individuals, from the stage of daily training and briefing, controllers need to be urged to attach greater importance to thoroughly performing their basic procedures and to strive to prevent the occurrence of human errors while paying attention to complementing each other's work through team play. It is difficult to completely eliminate the occurrence of errors resulting from human factors only with human efforts. When the RWSL for which work is going on for

introduction at Fukuoka Airport goes into operation, it will become an effective tool for preventing the occurrence of similar cases. Therefore, it is desirable that the efforts for the introduction of the system should be promoted.

- (2) When the TWR controller issues a take-off clearance, the controller usually checks the Final whether there is an arrival aircraft, by using the BD. However, it is probable that the confirmation process had not been thoroughly performed in this serious incident; as a result, the Aircraft A had been overlooked. After the occurrence of this serious incident, the use of an improved Reminder has been resumed at the Fukuoka Aerodrome Control Tower under the instructions by the Air Traffic Control Division of the Civil Aviation Bureau. This being the case, the adoption of effective Reminder systems, including the arrival aircraft strip, needs to be considered for each airport control tower in a manner which is appropriate for the situation at the respective airports.

4. PROBABLE CAUSE

It is highly probable that this serious incident occurred as follows: When the Aircraft A (arrival aircraft) was approaching Fukuoka Airport after receiving a landing clearance from the TWR, a take-off clearance was issued by the TWR for the Aircraft B (departure aircraft) and the Aircraft B entered the runway. As a result, the Aircraft A which had already obtained the landing clearance was involved the situation that it attempted landing to the same runway.

The TWR had issued a landing clearance for the Aircraft A, but he also issued a take-off clearance for the Aircraft B. It is probable that this occurred because the TWR had forgotten the existence of the Aircraft A.

It is probable that the TWR had forgotten the existence of the Aircraft A because he did not check thoroughly whether an arrival aircraft was displayed on the BD despite poor visibility on the Final. In addition, it is probable that the TWR had been concerned about the timing for the runway inspection and that his attentiveness had declined after the issuance of the landing clearance to the Aircraft A because his job had come to a pause before starting communication with the Aircraft B are the contributing factors.

5 ACTIONS TAKEN

5.1 Measures Taken by Civil Aviation Bureau

The Air Traffic Control Division of the Air Traffic Service Department (which was so called at that time but is currently called the Air Navigation Service Department), the Civil Aviation Bureau, issued an office circular titled "About Performing ATC Services More Steadily and Enhancing Awareness about Safety," dated May 11, 2011, to the Tokyo Regional Civil Aviation Bureau and the Osaka Regional Civil Aviation Bureau calling for further ensuring that each of the controllers perform their basic procedures without fail and implementing measures in an appropriate manner to facilitate cooperative and complementary work among the controllers as a team in order to eliminate errors in their services. The circular also instructed fully investigating and examining each occurrence, regardless of the size of the case involved, and by actively using the results, striving to prevent the reoccurrence of similar incidents.

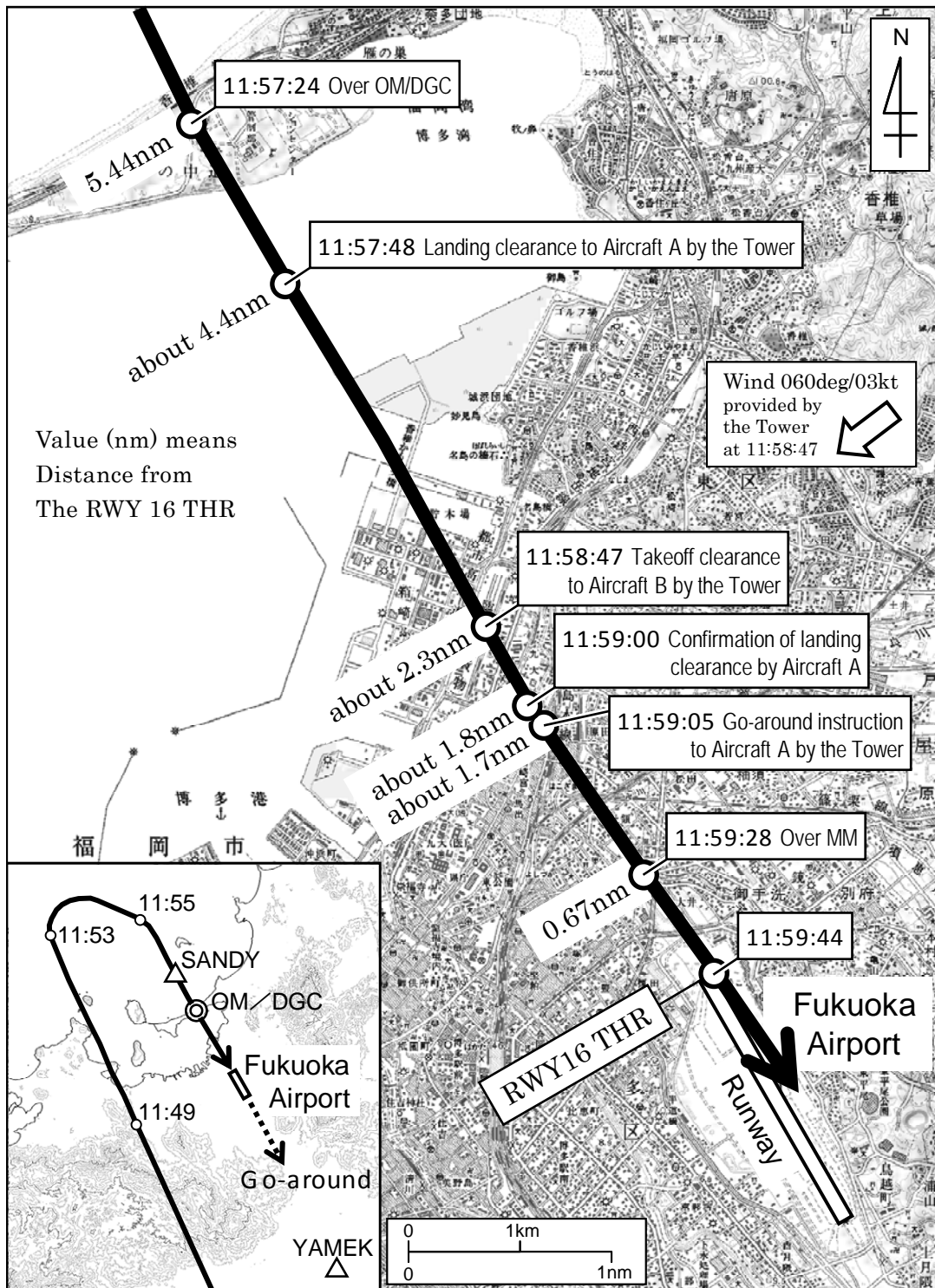
The Division also issued another office circular titled “About the Use of a Strip in Aerodrome Traffic Control,” dated May 18, 2011, instructing the use of an arrival aircraft strip on an experimental basis on the conditions that it will work as a Reminder for an aircraft under control of the air traffic controller involved and that take-off and landing clearances can be confirmed.

5.2 Measures Taken by Fukuoka Airport Office

The Fukuoka Airport Office of the Osaka Regional Civil Aviation Bureau implemented the measures as listed below after the occurrence of this serious incident.

Upon receiving the office circular “About Performing ATC Services More Steadily and Enhancing Awareness about Safety” from the Osaka Regional Civil Aviation Bureau, the Airport Office instructed the controllers to perform their basic procedures without fail, and use correct air traffic control terms in a thorough manner and implement double checks as much as possible for prevention of human errors, and provide ATC services while keeping enough time to spare. As a reminder system in aerodrome control, the controllers are using a strip holder with “APPROACH,” “LANDING” and other remarks entered, instead of the arrival aircraft strip. In addition, the Airport Office has introduced a double watch system by introducing a controller in charge of monitoring the TWR.

Figure 1 Estimated Flight Route of Aircraft A



SANDY, YAMEK : waypoints

DGC : Fukuoka VORTAC
 MM : Middle Marker
 OM : Outer Marker

Figure 2 Estimated Taxiing Route of Aircraft B

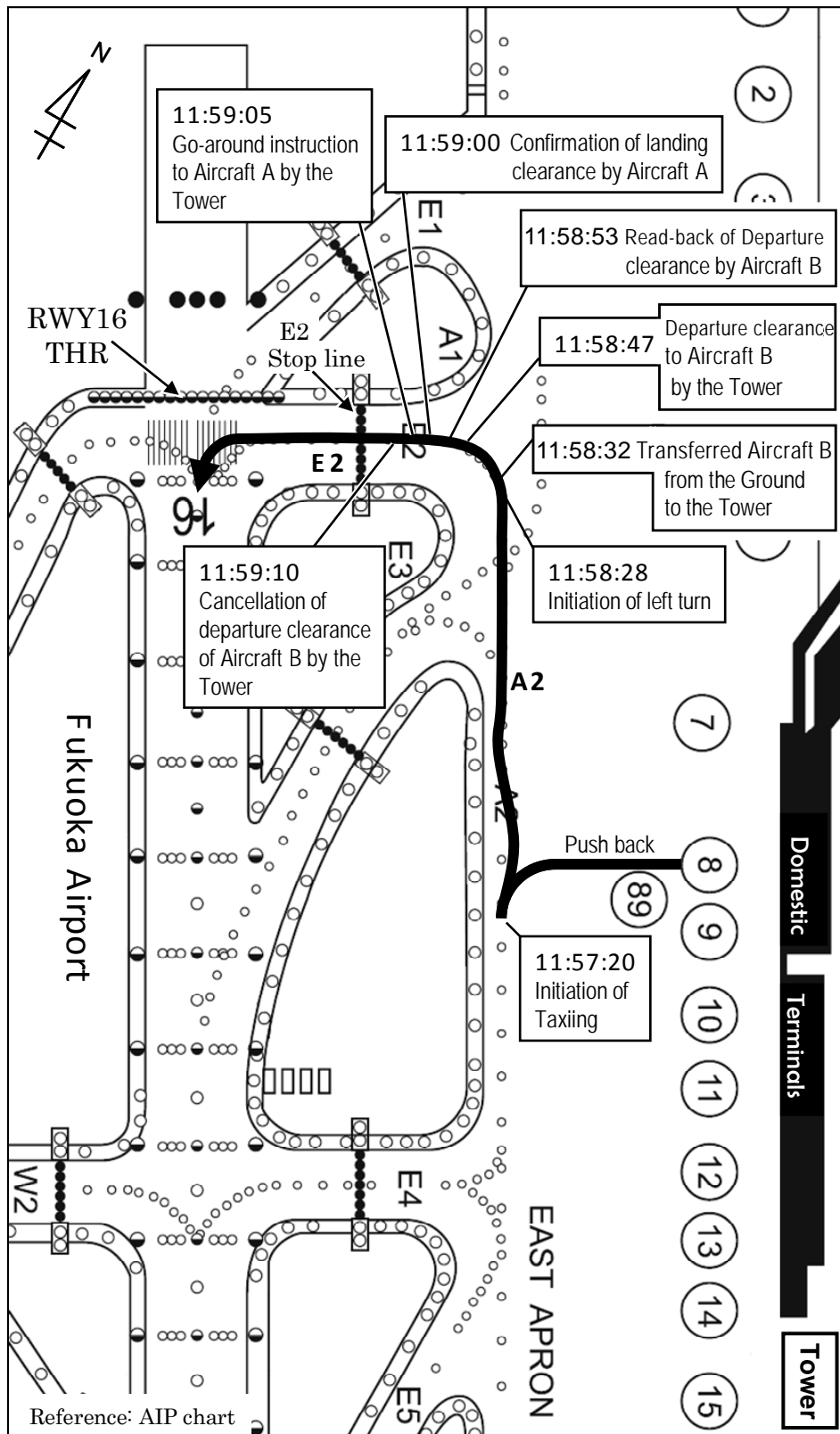


Figure 3 Estimated Traffic Condition in Area Concerned at the Aerodrome at the Time of Occurrence of the Serious Incident

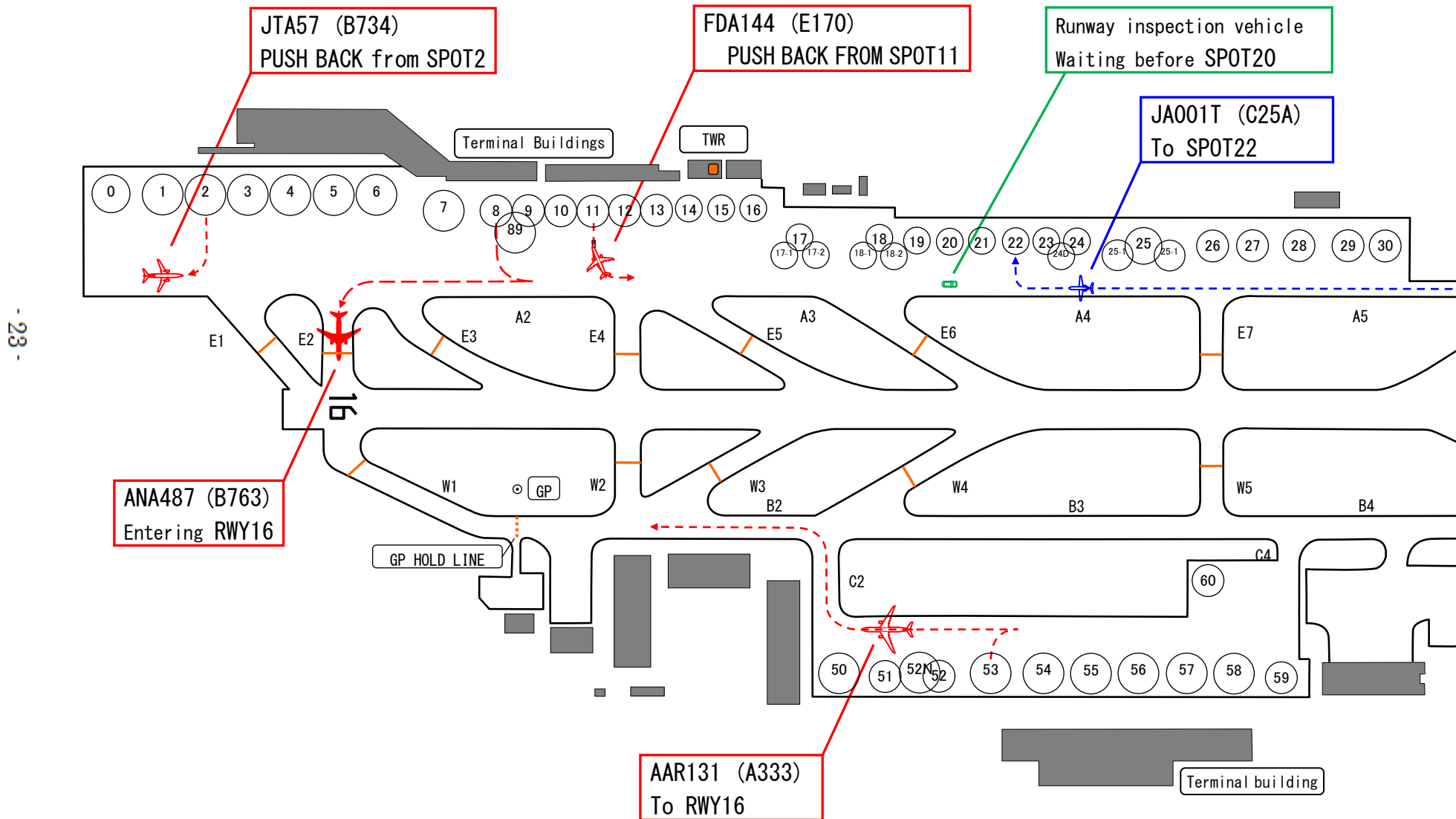


Figure 4 Three Angle View of Bombardier DHC-8-402

Unit: m

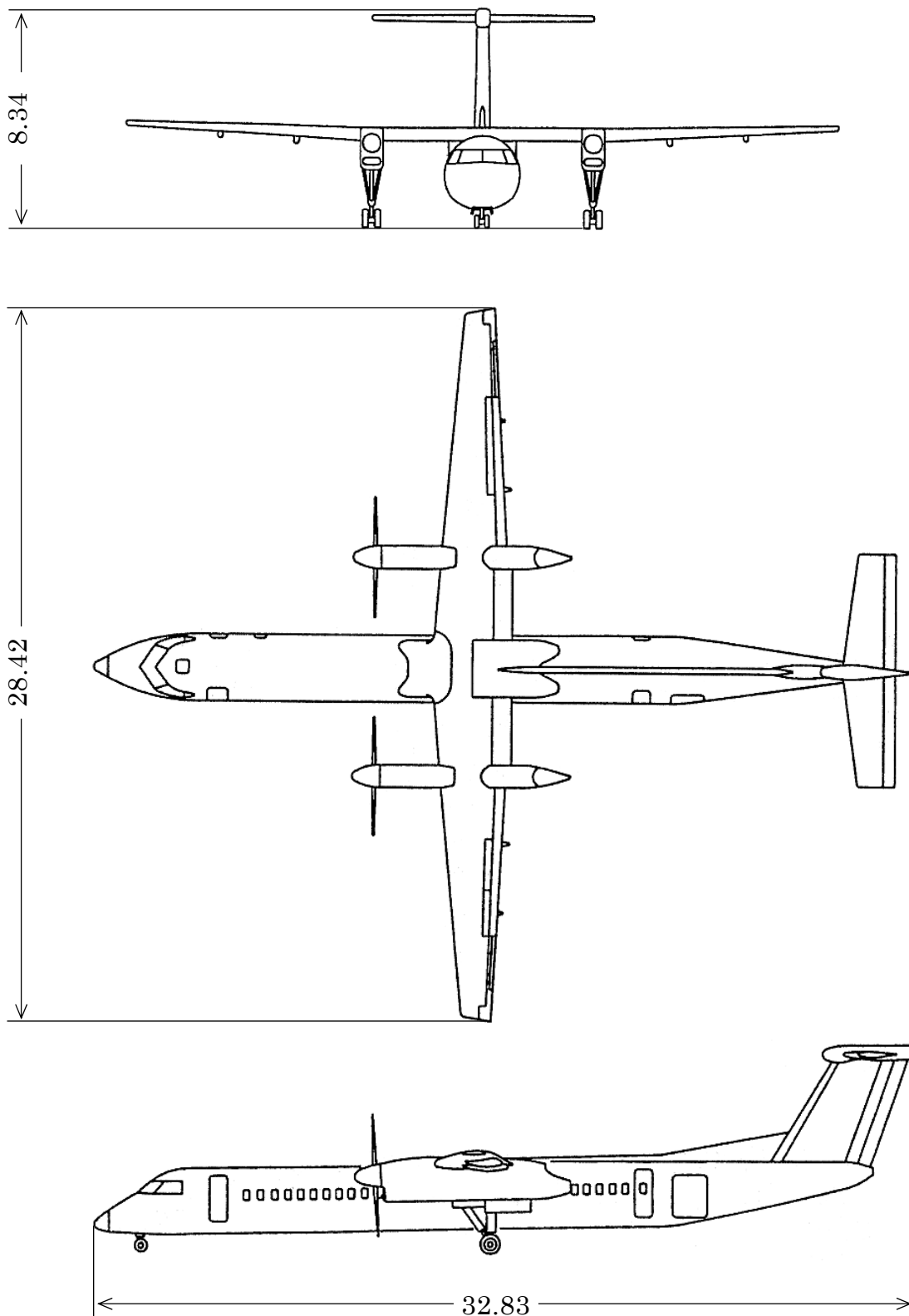


Figure 5 Three Angle View of Boeing 767-300

Unit: m

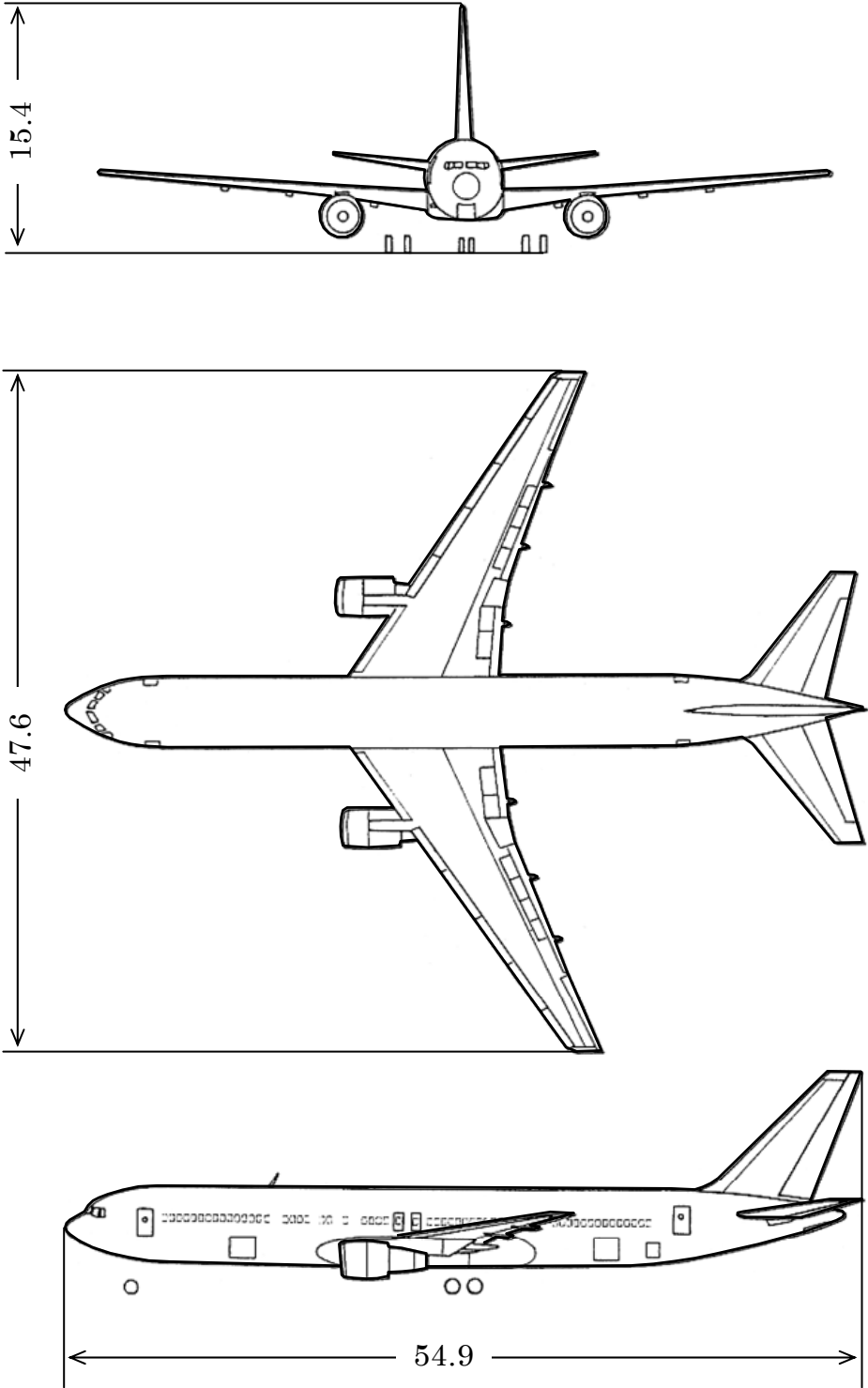
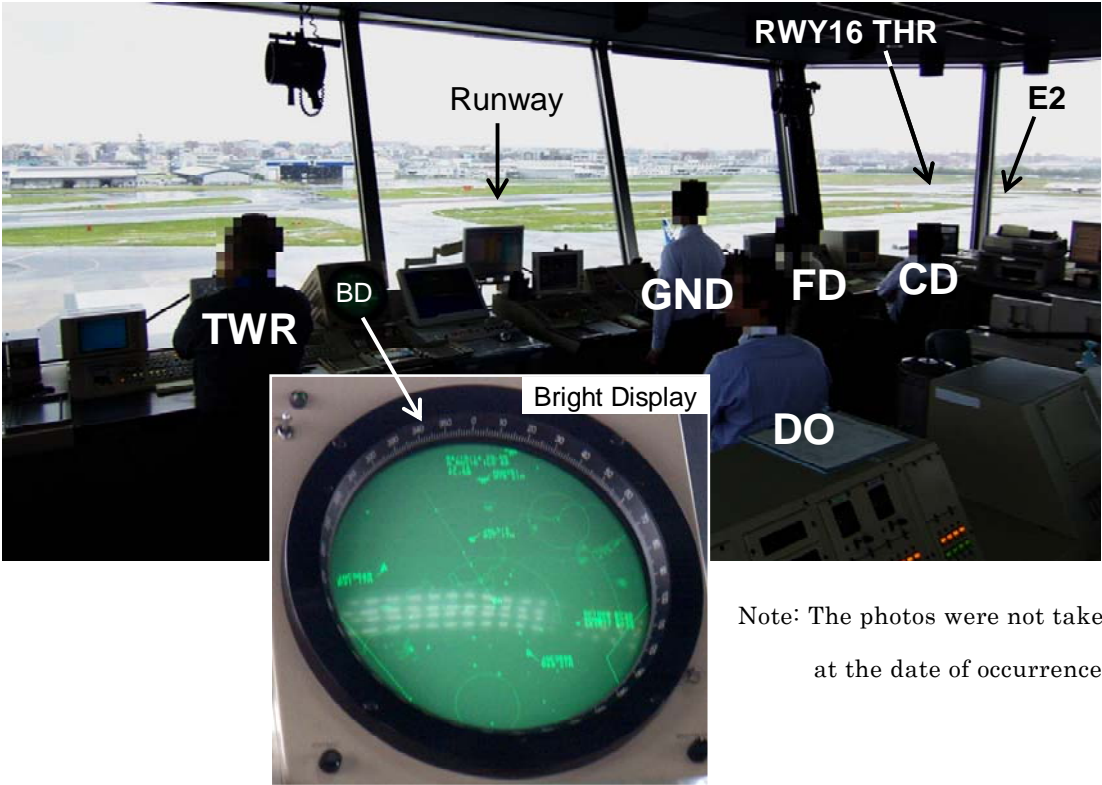


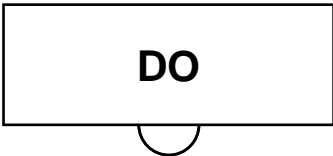
Photo 1 Layout of the Control Tower and View of the Runway



Note: The photos were not taken at the date of occurrence.



(Trainee / Instructor)



Seating assignment for air traffic controllers at the time of the serious incident

Attachment 1 ATC Communications

JST (hh:mm:ss)	Fukuoka Tower (118.4MHz)		Fukuoka Ground (121.7MHz)	
	Origin	Contents	Origin	Contents
		(Omitted)		(Omitted)
11:48:29			ANA487	Fukuoka Ground, ANA487, spot 8, request push back , information N.
11:48:36			GND	ANA487, Fukuoka Ground, stand by push back due to departure traffic.
11:48:39			ANA487	Standing by, ANA487.
11:52:20	JA001T	Fukuoka Tower, JA001T, approaching SANDY(waypoint).		(Omitted)
11:52:25	TWR	JA001T, Fukuoka Tower, roger, runway 16, continue approach, wind 330 at 4.		
11:52:31	JA001T	Continue approach, 001T.		
11:52:52	JAL3513	Fukuoka Tower, JAL3513, ready.		
11:52:55	TWR	JAL3513, runway 16, line up and wait.		
11:52:58	JAL3513	Runway 16, line up and wait, JAL3513.		
11:53:02	TWR	ANA250, contact departure 119 decimal 7.		(Omitted)
11:53:04			GND	ANA487, runway 16, push back approved.
11:53:06	ANA250	Contact departure 1197, ANA250.		
11:53:09			ANA487	Push back runway 16, ANA487.
11:53:39	TWR	JAL3513, wind 020 at 3, runway 16, cleared for take off.		(Omitted)
11:53:44	JAL3513	Runway 16, cleared for take off, JAL3513.		
11:53:55	COA916	COA916, ready, holding short..short of runway 16 on the west side.		
11:54:01	TWR	COA916, Fukuoka Tower, roger, hold short of runway 16.		
11:54:06	COA916	Hold short 16.		
11:54:23	TWR	JA001T, another departure Boeing 737 before you, continue approach.		
11:54:28	JA001T	Continue approach, 001T.		
11:54:31	TWR	COA916, runway 16, line up and wait.		
11:54:34	COA916	Line up and wait runway 16, COA916.		
11:55:00	TWR	JAL3513, contact departure 119 decimal 7.		
11:55:03	JAL3513	Departure 1197, JAL3513, good day.		
11:55:07	TWR	Good day.		

11:55:08	TWR	COA916, arrival 4nm, wind 030 at 3, runway 16, cleared for take off.		
11:55:13	COA916	Cleared for take off runway 16, COA916.		
11:55:23	JAC3626	Fukuoka Tower, JAC3626, 3nm to SANDY.		
11:55:27	TWR	JAC3626, Fukuoka Tower, roger, runway 16, continue approach , wind 340 at 4.		
11:55:33	JAC3626	JAC3626, continue approach, runway 16.		
11:55:37	TWR	JA001T, departure rolling, caution wake turbulence from departing 737, runway 16, cleared to land, wind 340 at 5.		
11:55:46	JA001T	Runway 16, cleared to land, 001T.		
11:56:23	TWR	COA916, contact departure 119 decimal 7.		
11:56:26	COA916	119.7, good day, COA916.		
11:56:29	TWR	Good day.		(Omitted)
11:57:07			ANA487	ANA487, request taxi.
11:57:10			GND	ANA487.. ANA487, runway 16, taxi via E2.
11:57:16	TWR	JA001T, turn left, contact ground 121 decimal 7.		
11:57:23	JA001T	Contact ground 1217, 001T.		
11:57:25			ANA487	Runway 16, taxi via E2 , ANA487.
11:57:29			GND	ANA4934, taxi to spot 8.
11:57:32			ANA4934	Taxi to spot 8, ANA4934.
11:57:30			JA001T	Fukuoka Ground, JA001T, E8, request taxi back.
11:57:38			GND	JA001T, Fukuoka Ground, taxi via A to spot 22.
11:57:44			JA001T	Spot 22 via A, 001T.
11:57:48	TWR	JAC3626, runway 16, cleared to land , wind 340 at 3.		
11:57:50			AAR131	Ground, AAR12..131, request taxi.
11:57:53	JAC3626	JAC3626, runway 16, cleared to land.		
11:57:54			GND	AAR131, roger, runway 16, taxi via C2, B, W2.
11:58:01			AAR131	Taxi to runway 16 via C2, B, W2, AAR131.
11:58:08			GND	FDA144, runway 16, push back approved.

11:58:13			FDA144	Push back runway 16, FDA144.
11:58:32			GND	ANA487, contact Tower 118 decimal 4.
11:58:35			ANA487	Tower , 1184, ANA487.
11:58:43	ANA487	Fukuoka Tower, ANA487, ready .		(Omitted)
11:58:47	TWR	ANA487, Fukuoka Tower, roger, wind 060 at 3, runway 16, cleared for take off .		
11:58:53	ANA487	Runway 16, cleared for take off , ANA487.		
11:59:00	JAC3626	JAC3626, confirm, runway 16, cleared to land ?		
11:59:04	TWR	Ah..		
11:59:05	TWR	JAC3626, go around .		
11:59:08	JAC3626	JAC3626, go around .		
11:59:10	TWR	ANA487, cancel departure clearance, line up and wait , runway 16.		
11:59:15	ANA487	ANA487, line up and wait .		
		(Omitted)		

Legend: **TWR** Fukuoka Tower
GND Fukuoka Ground
ANA487 All Nippon 487 (Boeing 767-300) Aircraft B
JA001T zero-zero-one-tango (Cessna Citation) Aircraft C
JAL3513 Japan Air 3513
ANA250 All Nippon 250
COA916 Continental 916
JAC3626 Commuter 3626 (DHC-8-402) Aircraft A
ANA4934 All Nippon 4934
AAR131 Asiana 131
FDA144 Fuji Dream 144

Note: Time were corrected by the Japan Standard Time(JST) recorded with ATC communications.

Attachment 2 Severity Classification for Runway Incursion

Chapter 6

CLASSIFICATION OF THE SEVERITY OF RUNWAY INCURSIONS

6.1 SEVERITY CLASSIFICATION FOR RUNWAY INCURSIONS

6.1.1 The objective of the runway incursion severity classification exercise is to produce and record the assessment of each runway incursion. This is a critical component of measuring risk, where risk is a function of the severity of the outcome and the probability of recurrence. Whatever the severity of the occurrence however, all runway incursions should be adequately investigated to determine the causal and contributory factors and to ensure risk mitigation measures are implemented to prevent any recurrence.

6.1.2 Severity classification of runway incursions should be assessed as soon as possible after the incident notification with due regard for the required information in paragraph 6.2. A reassessment of the final outcome may be applied at the end of the investigation process.

6.1.3 For the purpose of global harmonization and effective data sharing, when classifying the severity of runway incursions, the following severity classification scheme should be applied:

Accident	Refer to ICAO Annex 13 definition of an accident.
A	A serious incident in which a collision was narrowly avoided.
B	An incident in which separation decreases and there is a significant potential for collision, which may result in a time-critical corrective/evasive response to avoid a collision.
C	An incident characterized by ample time and/or distance to avoid a collision.
D	Incident that meets the definition of runway incursion such as incorrect presence of a single vehicle/person/aircraft on the protected area of a surface designated for the landing and take-off of aircraft but with no immediate safety consequences.
E	Insufficient information inconclusive or conflicting evidence precludes severity assessment.