국토교통부

ARAIB/AIR1504

Aircraft Serious Incident Report

Landing on Runway Used by Another Aircraft

Eastar Jet

B737-800, HL8292

Runway 24R, Cheongju Int'l Airport

28 May 2015

May 2016

국토교통부

항공철도사고조사위원회

Aviation and Railway Accident Investigation Board

This aircraft serious incident report has been prepared in accordance with the Article 25 of the Aviation and Railway Accident Investigation Act of the Republic of Korea.

According to the provisions of the Article 30 of the Aviation and Railway Accident Investigation Act, it is stipulated;

The accident investigation shall be conducted separately from any judicial, administrative disposition or administrative lawsuit proceedings associated with civil or criminal liability.

And in the Annex 13 to the Convention on International Civil Aviation, Paragraphs 3.1 and 5.4.1, it is stipulated as follows:

The sole objective of the investigation of an accident or incident shall be the prevention of accidents and incidents. It is not the purpose of the activity to apportion blame or liability. Any investigation conducted in accordance with the provision of this Annex shall be separate from any judicial or administrative proceedings to apportion blame or liability.

Thus, this investigation report shall not be used for any other purpose than to improve aviation safety.

In case of divergent interpretation of this report between the Korean and English languages, the Korean text shall prevail.

Aircraft Serious Incident Report

Aviation and Railway Accident Investigation Board, *Landing On Runway Used By Another Aircraft, Eastar Jet, B737-800, HL8292, Runway 24R, Cheongju International Airport, 28 May 2015.* Aircraft Serious Incident Report ARAIB/AIR1504. Sejong Special Self-Governing City, Republic of Korea.

The Aviation and Railway Accident Investigation Board (ARAIB), Republic of Korea, is a government organization established for independent investigation of aviation and railway accident, and the ARAIB conducts accident investigation in accordance with the provisions of the Aviation and Railway Accident Investigation Act of the Republic of Korea and Annex 13 to the Convention on International Civil Aviation.

The objective of the investigation by the ARAIB is not to apportion blame or liability but to prevent accidents and incidents.

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Contents

Landing on Runway Used by Another Aircraft

- Operator: Eastar Jet
- Manufacturer: Boeing Company
- Type: B737-800
- Registration Mark: HL8292
- Location: Cheongju International Airport, Runway 24R
- Date & Time: 28 May 2015, about 15:52 (Korean Standard Time)[1)]

Synopsis

On 28 May 2015, about 13:40, Eastar Jet flight 7942 (hereafter referred to as "HL8292") took off from Zhengzhou Xinzheng International Airport (hereafter referred to as "Zhengzhou Airport") bound for Cheongju International Airport (hereafter referred to as "Cheongju Airport"). About 15:52, the flight crew, while decelerating the aircraft after landing at runway 24R in Cheongju Airport, saw a Phantom fighter jet (hereafter referred to as the "fighter jet"), which had landed earlier and not vacated runway 24R yet, and immediately stopped it, but the aircraft came within about 3,000 ft (1,000 m) of the fighter jet. As a result of this serious incident, no personal injury and aircraft damage occurred.

The Aviation and Railway Accident Investigation Board (ARAIB) determined that the probable causes of this serious incident were 「① the misjudgment and inattention of the tower controller who failed to instruct HL8292 to reduce an approach speed or make go-around to prepare for the possibility that the preceding fighter jet and the succeeding HL8292 would get near to each other o the same runway; and ② the inattention of the flight crew who failed to check the fighter jet's landing runway direction (24R) and observe the fighter jet constantly.」

1) Unless otherwise indicated, all times in this report are Korean Standard Time, based on 24-hour clock.

Contributing to the serious incident were (1) the tower controller's failure to provide HL8292 with traffic information on the preceding fighter jet's landing runway direction (24R); and (2) the tower controller's inadequate use of ATC phraseology when instructing the fighter jet to vacate the runway.

As a result of this investigation, the ARAIB makes three safety recommendations to the ROK Air Force (Cheongju Control Tower) and one safety recommendation to Eastar Jet.

1. Factual Information

1.1 History of Flight

At 13:40, HL8292 which had taken off from Zhengzhou Airport, China flew to Cheongju Airport, the Republic of Korea, via airways A641, W4, G597, and Y664.

After entering the Korean airspace, the captain handed control of the flight over to the first officer (FO) and acted as the Pilot Monitoring (PM) until the aircraft landed at Cheongju Airport.

HL8292, following the Seoul Approach Control's (SEL APP) instruction, descended to 7,000 ft, contacted the Osan Approach Control (OSN APP), which advised HL8292, "Direct OSPOT, then after OSPOT,[2] heading 060," and flew direct to OSPOT.

HL8292 was given an instruction to contact Jungwon Approach Control (JWN APP) at OSPOT by OSN APP, and JWN APP advised the aircraft to proceed direct to BIDAN.[3] HL8292 requested JWN APP to allow a short pattern runway 24R since its estimated arrival time would exceed its scheduled one in Cheongju Airport due to a delayed departure from Zhengzhou Airport.

Given radar vector of JWN APP, HL8292 maintained 6,000 ft and heading 090. At 15:41:55, HL8292 was given radar vector of Cheongju Ground Controlled Approach (CJJ GCA), and after being cleared for an ILS approach to runway 24R at 15:47:11, was put on the final approach course.

2) A mandatory reporting point on A582 (36-50-18N 127-20-55E).
3) An initial approach fix (IAF) for ILS/DME Z RWY 24R at Cheongju Airport (36-57-47.37N 127-37-26.09E).

At 15:48:55, HL8292 reported to CJJ GCA, “Runway in sight”, and CJJ GCA advised HL8292, “Traffic two fighter on downwind. You are number three. Contact Tower 118.7.” About 15:49:07, the Cheongju Control Tower (hereafter referred to as the “Cheongju Tower”) cleared the second fighter jet on the downwind leg for landing at runway 24R.

According to the statement of the tower controller, he cleared the fighter jet for landing at runway 24R because he concluded that HL8292 could land on runway 24R without any problems although the fighter jet with a landing clearance would have landed earlier on the same runway.

At 15:49:20, HL8292 informed the Cheongju Tower that it was established on an ILS runway 24R. At 15:49:37, the Cheongju Tower instructed HL8292, “Traffic one F-4 turning base to final, wind 360 at 3, cleared to land runway 24R.” At 15:49:40, the captain responded, “Cleared to land 24R and traffic in sight.”

According to the captain’s statement, he could not know that the fighter jet would land on runway 24R because the radio frequency used between the Cheongju Tower and the fighter jet was different from that of HL8292, thereby thinking that the fighter jet would certainly land on runway 24L. He also added that he had concentrated on monitoring the FO’s landing maneuvers and handling cockpit instruments for landing because HL8292 had been cleared to land on 24R.

At 15:51:18, the Cheongju Tower instructed the fighter jet which had landed earlier, “Taxi without delay due to behind airliner traffic,” and at 15:51:40, again advised, “Say again taxi without delay.”

At 15:51:48, HL8292, during the landing roll on runway 24R, found the

fighter jet on the same runway and attempted to stop abruptly, but came within about 3,000 ft (1,000 m) of it. HL8292 reported to the Cheongju Tower that it had stopped because there had been a traffic in front of it and, after the fighter jet vacated runway 24R, turned 180° at the end of runway 24R and taxied to the aircraft stand for civil aviation.

1.2 Injuries to Persons

Aboard the aircraft were two flight crew, four cabin crew, one aircraft mechanic, and 176 passengers, and there were no personal injuries as a result of this serious incident.

1.3 Damage to Aircraft

As a result of this serious incident, there was no damage to the aircraft.

1.4 Other Damage

As a result of this serious incident, there was no other damage.

1.5 Personnel Information

1.5.1 The Captain

The captain (male, age 41) held a valid air transport pilot license,[4] a B737 type rating,[5] a first-class airman medical certificate,[6] an aeronautical radio operator license,[7] and a level 4 ICAO English Proficiency Certificate.

4) License No.: 11-003746 (issued on 23 Jan. 2015).
5) Rating No.: 11-003746 (issued on 23 Jan. 2015).
6) Certificate No.: 122-9983 (valid until 30 Sep. 2015).
7) License No.: 00-34-1-0106 (acquired on 21 Apr. 2000).

The captain accumulated 7,494 total flight hours, including 4,526 hours in B737 airplanes, 2,756 hours of which have been flown as pilot-in-command. In the 90 days and 30 days before the serious incident, he accumulated 241 and 83 hours, respectively.

The captain passed his line check on 16 June 2014. Also, he completed his simulator recurrent training and passed his proficiency check on 29 and 30 March 2015, respectively.

In the 72 hours before the serious incident, the captain had a day off on 25 May. On 26 May, he operated a domestic flight (Gimpo-Jeju-Gimpo) from 07:05 to 09:40, moved to Jeju on an afternoon flight, and took a rest at the crew hotel. On 27 May, he operated a domestic flight (Jeju-Cheongju) from 08:00 to 09:10 and then, an international flight (Cheongju-Hefei-Cheongju) from 10:00 to 18:10. After the flight, he had dinner and went to sleep at the crew hotel. He stated that he had not drunk any alcohol or taken any illegal medication in the 24 hours before the incident flight.

1.5.2 The First Officer

The FO (male, age 43) held a valid air transport pilot license,[8] a B737 type rating,[9] a first-class airman medical certificate,[10] an aeronautical radio operator license,[11] and a level 4 ICAO English Proficiency Certificate.

The FO accumulated 5,242 total flight hours, including 3,459 hours in B737 airplanes. In the 90 days and 30 days before the serious incident, he accumulated 150 and 51 hours, respectively.

8) License No.: 12-006656 (issued on 26 Feb. 2014).
9) Rating No.: 12-006656 (26 Feb. 2014).
10) Certificate No.: 122-11596 (valid until 29 Feb. 2016).
11) License No.: 05-34-1-0408 (acquired on 8 Dec. 2005).

The FO completed his simulator recurrent training and passed his proficiency check on 14 and 15 February 2015, respectively. Also, he passed his line check on 8 March 2015.

In the 72 hours before the serious incident, he had a day off on 25 May. On 26 May, he operated a domestic flight with the captain, moved to Jeju on an afternoon flight, and took a rest at the crew hotel. On 27 May, he and the captain again operated a domestic flight (Jeju-Cheongju) and then, an international flight (Cheongju-Hefei-Cheongju). After the flight, he took a rest at the crew hotel. He stated that he had not drunk any alcohol or taken any illegal medication in the 24 hours before the incident flight.

1.5.3 The Air Traffic Controller

The Cheongju Tower's air traffic controller (male, age 33) in charge of local control during HL8292's landing on runway 24R held a valid air traffic control certificate[12] and a third class airman medical certificate.[13]

He performed air traffic control duties at the Suwon Control Tower for about 12 years and 8 months,[14] from 16 July 2001 to 30 March 2014, and, since he was transferred to the Cheongju Tower on 31 March 2014, has performed the duties for about 14 months. After a transfer to the Cheongju Tower, he obtained a local control rating and a level 4 G-TELP Korea English Proficiency Test for Aviation on 18 July and 29 September 2014, respectively.

In the 72 hours before the serious incident, he took a rest in the daytime on 26 May, and, from 17:45 on 26 May to 09:00 on 27 May, was on night duty,

12) Certificate No.: 1145 (issued by the Korea Transportation Safety Authority (KTSA) and acquired on 7 May 2004).
13) Issued by the Aeromedical Squadron under the ROKAF 17th Fighter Wing on 15 Feb. 2015 and valid for a year.
14) Out of 12 years and 8 months, he performed radar control duties for about 8 months.

after which he went home and rested. On 28 May, he started his day duty at 08:45. He stated that he had not drunk any alcohol or taken any illegal medication while he had stayed at home.

1.6 Aircraft Information

1.6.1 General

HL8292 was manufactured[15] by Boeing Company on 24 July 2000, leased by Eastar Jet on 24 May 2013, and registered[16] in Korea. The aircraft was delivered on 25 June 2013 and held a valid airworthiness certificate.[17]

It logged 37,026 flight hours and 28,128 cycles.

The aircraft was equipped with two CFM[18] 56-7B26 engines manufactured by CFM International, and the details of the engines are shown in [Table 1].

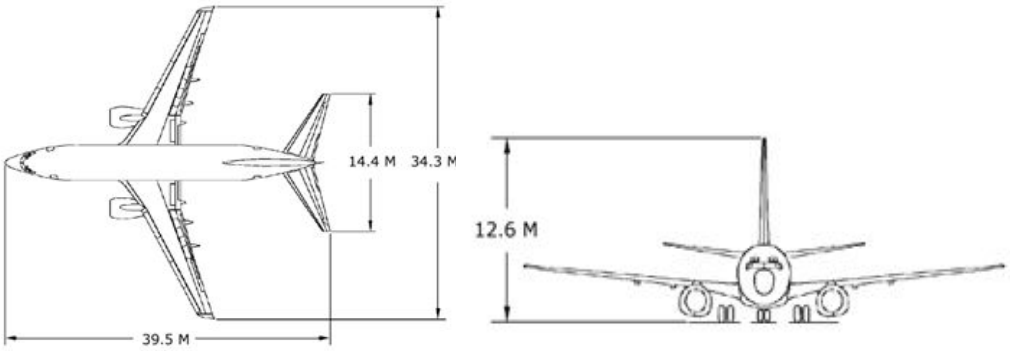
Location	Serial No.	Cycle	Installation Date
LH (No. 1)	890942	14,245	12 Mar. 2010
RH (No. 2)	890149	687	7 Jan. 2015

[Table 1] HL8292 Engines

1.6.2 Aircraft Specifications

General specifications of HL8292 are shown in [Figure 1].

15) Serial No.: 28323.
16) Registration Date: 23 Jun. 2013.
17) Certificate No.: IS13020.
18) CFM International is a joint venture between GE Aviation, a division of General Electric of the United States and Snecma, a division of Safran of France. The names of CFM International and the CFM56 product line are derived from the two parent companies' commercial engine designations: GE's CF6 and Snecma's M56.



[Figure 1] Specifications of HL8292

1.6.3 Weight and Balance

The weight and balance data of HL8292 is as follows:

Zero Fuel Weight (ZFW)	56,406 kg (Max. ZFW: 62,731 kg)
Takeoff Weight (TOW)	65,106 kg (Max. TOW: 78,999 kg)
Landing Weight (LDW)	59,606 kg (Max. LDW: 66,360 kg)
Landing Weight C.G % MAC	24.42%
MAC Margin	11.5 - 33.0% MAC

* HL8292's landing weight and center of gravity (C.G) were within the permissible range.

1.7 Meteorological Information

When HL8292 landed at Cheongju Airport about 15:52, the airport weather observation reported wind from 300° at 5 kts, 7 miles visibility, few clouds at 20,000 ft above ground level, temperature of 32°C, and an altimeter setting of 29.73 inches of mercury, which indicated that the visual meteorological conditions prevailed. Therefore, no problems with the flight operation were reported.

1.8 Aids to Navigation

When approaching and landing at runway 24R of Cheongju Airport, HL8292 used radar facilities and the instrument landing system, both of which were in normal operation.

1.9 Communications

When HL8292, using the VFH, communicated with CJJ GCA and the Cheongju Tower to approach and land at Cheongju Airport, no problems with any communications equipment were reported. The fighter jet used the UHF. The major content of the ATC/pilot communications[19] and the analysis of the event are shown in [Table 2] and [Figure 2], respectively.

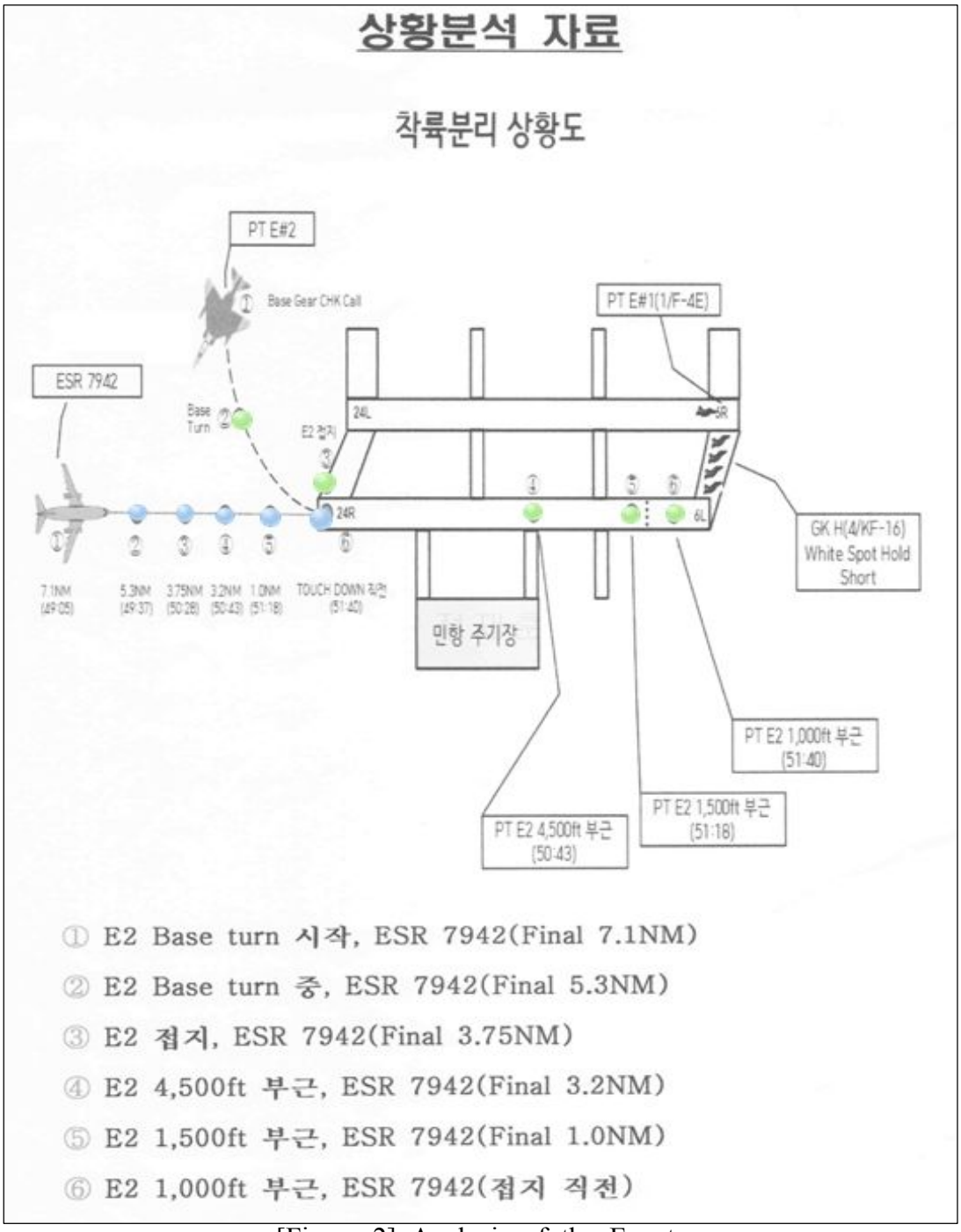
Time	Speaker	Content
15:42:12	C	ESR7942, confirm ILS Zulu via BIDAN?
15:42:15	P	Ah, negative. Request short pattern, Zulu runway 24R.
15:47:11	C	ESR7942, cleared ILS/DME 24R approach, report established.
15:47:15	P	Cleared ILS runway 24R approach, report established, ESR7942.
15:48:28	C	7942, confirm established?
15:48:32	P	Now established.
15:48:34	C	Continue approach, report runway in sight.
15:48:36	P	Continue approach, report runway in sight, ESR7942.
15:48:55	P	ESR7942, runway in sight.
15:48:56	C	ESR7942, traffic 2 fighter on downwind. You are number 3. Contact Tower 118.7.

19) Only the content of the ATC/pilot communications which is necessary for the determination of the causes was extracted and represented in this report.

Time	Speaker	Content
15:49:04	P	Roger number 3, contact Tower 118.7, ESR7942, thank you.
15:49:05	F4	Tower Echo 2 base, gear check, full stop 24R.
15:49:07	C	Echo 2, runway 24R cleared to land.
15:49:20	P	Good afternoon Tower, ESR7942 established runway 24R.
15:49:35	P	Tower, ESR7942 established 24R.
15:49:37	C	ESR7942 traffic one F-4 turning base to final, wind 360 at 3, cleared to land runway 24R.
15:49:40	P	Cleared to land 24R and traffic in sight. ESR 7942.
15:51:18	C	Echo 2 taxi without delay due to, due to behind airliner traffic.
15:51:23	F4	Roger, Echo 2.
15:51:40	C	Echo 2, I say again taxi without delay.
15:51:48	P	ESR7942 we have a traffic in front of us, Phantom.
15:51:56	C	ESR7942, roger. After the traffic will cleared runway, 180° back at the end of runway.
15:52:13	P	Roger, cleared traffic, 180° back at the end of runway. ESR7942.

* C: controller, P: HL8292, F4: fighter jet

[Table 2] ATC/Pilot Communications



[Figure 2] Analysis of the Event

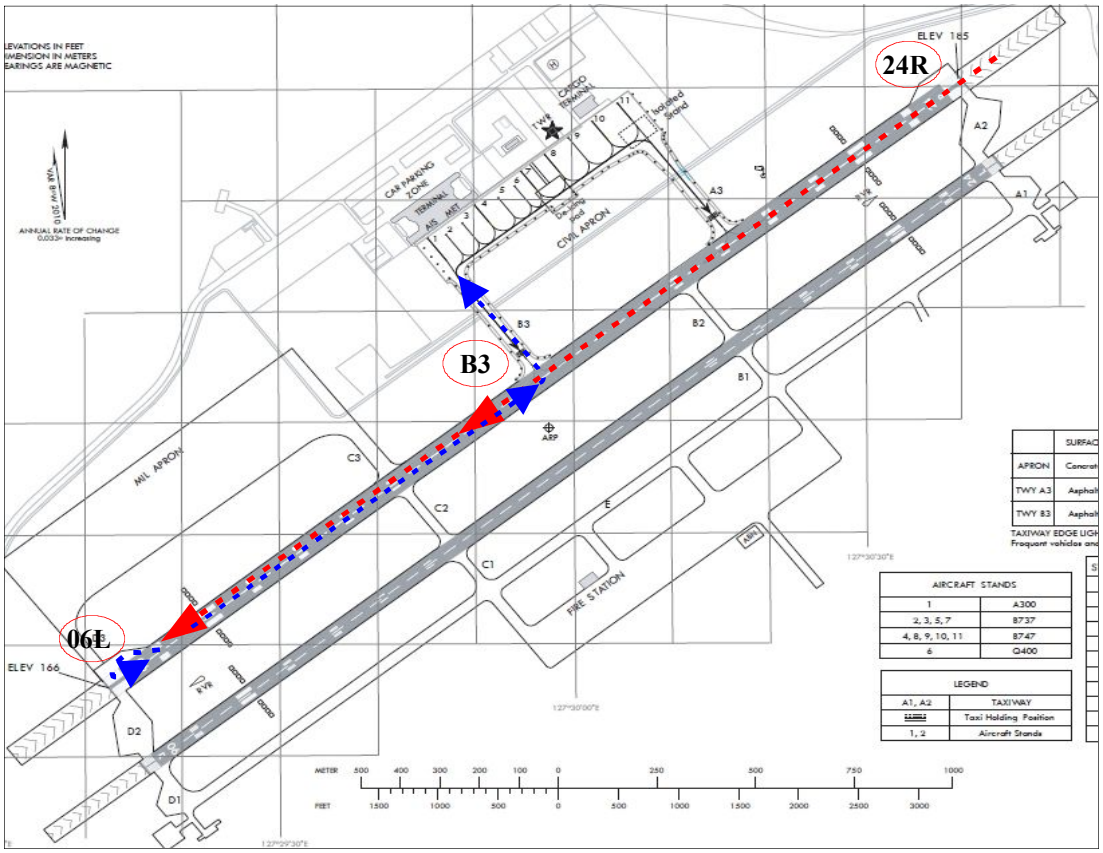
1.10 Aerodrome Information

Cheongju Airport's runway chart is shown in [Figure 3], and runway 24R where HL8292 landed is 2,744 m long and 60 m wide, and is paved with

concrete. Runway 24R taxiing procedures for non-military aircraft are as follows: after landing, the aircraft turns 180° at the end of runway 24, taxies backwards until taxiway B3, and moves to the aircraft stand for civil aviation via taxiway B3. Runway 24R is mainly used by non-military aircraft, but depending on traffic situations, by fighter jets as well.

Non-military aircraft landing on runway 06L does likewise: after landing, the aircraft turns 180° at the end of runway 06L, taxies backwards until taxiway A3, and moves to the aircraft stand for civil aviation via taxiway A3.

Runway 24L used primarily by flighter jets is 2,744 m long and 45 m wide, located left of and parallel to runway 24R.

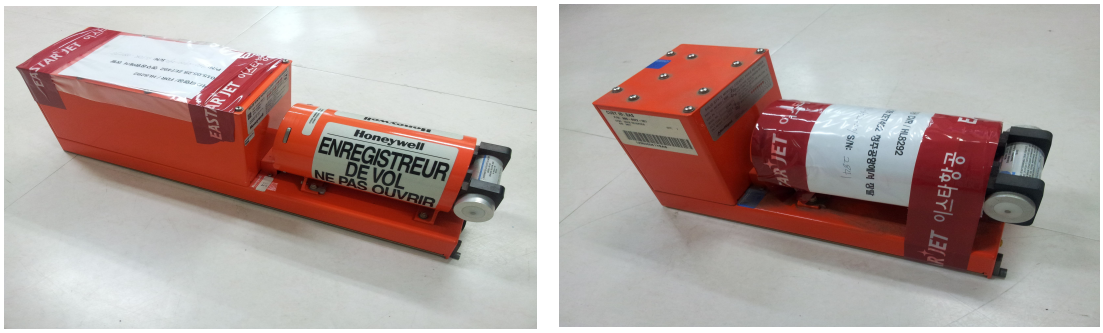


[Figure 3] Cheongju Airport's Runway Chart

1.11 Flight Recorders

Flight recorders, flight data recorder (FDR) and cockpit voice recorder (CVR), installed on HL8292 are shown in [Figure 4].

FDR CVR



[Figure 4] FDR and CVR

1.11.1 Flight Data Recorder

The specifications of the FDR installed on HL8292 are as follows:

○ Manufacturer: Honeywell in the US
Type: SSFDR (Solid State FDR)
Part No.: 980-4700-042
Serial No.: SSFDR-08075
Weight & Power Requirements: 6.8 kg / 15 Watt, 115 VAC 400 Hz
Impact Shock: 3,400G
Fire Protection: max. 1100° (60 min.)
Deep Sea Pressure: 20,000 ft (30 days)

1.11.1.1 FDR Data

HL8292's FDR recorded about 26 hours and 30 minutes of data. Each

elapsed second of recorded information is called a sub-frame and is identified by a Sub-frame Reference Number (SRN). The data extracted from the FDR was the final flight record of HL8292, lasting about 2 hours and 3 minutes.

1.11.1.2 Engineering Unit Conversion

Engineering unit conversion used in this report was based on Boeing Company's technical document, D226A101-2 rev E (737-800 Data-frame Interface Control and Requirements Document). In case the aircraft climbs or makes a right turn, engineering units are given a plus (+) value, whereas they are given a minus (-) value in case the aircraft descends or makes a left turn. If the manufacturer's units had different values, they were modified to be consistent with the principle above.

1.11.1.3 FDR Data Analysis

Based on the FDR data, the analysis lab of the ARAIB confirmed the following factual information:

The lab analyzed the FDR parameters recorded from the point where the aircraft had been flying at 5,000 ft, about 14 miles from the airport, to the point where the aircraft had stopped on the runway. Some parameters were compared to the time frame between pre-takeoff and takeoff in order to confirm the validity of numerical values.

○ During the time frame which was analyzed, engines and control surfaces responded appropriately to the flight crew's input, and no anomalies were found.

○ At 15:46:20 (5 minutes and 20 seconds before landing), the aircraft was

flying at about 205 kts at an altitude of 5,000 ft, about 14 miles from the runway. It achieved landing configuration of flaps and gear up, weighing about 59,656 kg.

○ At 15:51:31 (9 seconds before landing), the aircraft attempted to land, flying at 144 kts at an altitude of 50 ft, with wind blowing from 293° at 6 kts.

○ At 15:51:40, the aircraft's nose landing gear touched down at 139.5 kts on a heading of 242° at coordinates N36°43'16" E127°30'16".

○ At the same time as landing, the reverser was deployed, and 2 seconds later, was stowed.

○ At 15:51:41, immediately after touchdown, the autobrake was engaged, and 7 seconds later, at 15:51:48, the manual brake was engaged.

○ The longitudinal G indicated -0.47G at 15:51:49, immediately after the engagement of the manual brake, and about 14 seconds later, reached -0.20G at 15:52:03, indicating the recovery of a normal value and the end of the event.

1.11.2 Cockpit Voice Recorder

HL8292 was equipped with the solid-state CVR utilizing integrated circuit (IC) memory as the recording medium. This CVR records the audio environment in the flight deck of an aircraft by digitally recording the signals of the microphones of the pilots' headsets and of an area microphone in the cockpit. The ARAIB, using the manufacturer's equipment, retrieved 2 hours, and 30 minutes of audio information from 2, and 4 input channels, respectively.

The audio data started from 05:07:31 UTC, about 17 minutes and 39 seconds after takeoff, lasting for about two hours. The ARAIB listened to the whole data and prepared a transcript of the portion necessary for investigation. The specifications of the CVR are as follows:

○ Manufacturer: Honeywell in the US
Type: SSCVR (Solid State CVR)
Part No.: 980-6022-001
Serial No.: 2841
Weight and Power Requirements: 5.9 kg / 8 Watt, 115 VAC 400 Hz
Impact Shock: 3,400G
Fire Protection: max. 1,100° (60 min.)
Deep Sea Pressure: 20,000 ft (30 days)

1.12 Wreckage and Impact Information

Wreckage and impact aspects are not related to this serious incident.

1.13 Medical and Pathological Information

Medical and pathological aspects are not related to this serious incident.

1.14 Fire

No fire occurred as a result of this serious incident.

1.15 Survival Aspects

Survival aspects are not related to this serious incident.

1.16 Tests and Research

There were no tests and research in relation to this serious incident.

1.17 Organizational and Management Information

1.17.1 Organization of the Cheongju Tower

The Cheongju Tower is staffed by the head of the Tower, a senior air traffic controller, team leaders, and junior air traffic controllers. Depending on air traffic, the Tower operates a day-duty team and three to four shift teams. The teams are headed by team leaders and work 24/7 in two to three shifts. The Tower team consists of the positions of local control, ground control, flight data, and a senior controller directing Tower operations.

1.17.2 Air Traffic Controller Training of the Cheongju Tower

Air traffic controllers of the Cheongju Tower receive the following training and make a topic presentation every year: aviation English training for ATC certificate acquisition; ATC seminar (making a case study on ATC, research topic presentations, etc.); ATC phraseology training (learning overall ATC terms, etc.); weather-related task training; safety information sharing training (sharing information on each other's jobs between air traffic controllers and pilots and preventing the recurrence of similar accidents through accident case study).

1.17.3 Organization of Eastar Jet's Operations Division

The operations division of Eastar Jet consists of the following teams: ① the flight crew management team in charge of flight crew qualifications management, personal supplies management, and new recruit management; ② the flight crew

training team in charge of the flight crew's initial and recurrent training; ③ the flight standards team in charge of evaluating flight standards and quality; and ④ the flight safety team in charge of Flight Safety Regulations and Operations Regulations.

1.17.4 ATC Training for Eastar Jet Flight Crew

Flight crew training provided by the flight crew training team consists of regular recurrent training and initial training. The recurrent training curriculum is composed of the subjects such as simulator training, line check, and ground training offering classroom lectures, and is annually organized according to Eastar Jet's own training regulations. Initial training provides newly hired flight crew with specialized training on each subject.

Training in relation to air traffic control consists of 18 hours of initial training and annual recurrent training covering three curriculum segments: ATC English; ATC clearance; and ATC procedures.

1.18 Additional Information

1.18.1 Air Traffic Control Procedures

1.18.1.1 Same Runway Separation

Paragraph 3-10-6 of Air Traffic Control Procedures (MLTM Notification No. 2015-410/23 June 2015) indicates the following: "a. Separate an arriving aircraft from another aircraft using the same runway by ensuring that the arriving aircraft does not cross the landing threshold until one of the following conditions exists or unless authorized in Paragraph 3-10-10, Altitude Restricted Low Approach. 1) The other aircraft has landed and is clear of the runway. Between

sunrise and sunset, if you can determine distances by reference to suitable landmarks and the other aircraft has landed, it need not be clear of the runway if the following minimum distance from the landing threshold exists."

1.18.1.2 Anticipating Separation

According to Paragraph 7.10.2 of Air Traffic Management (ICAO Doc 4444), "an aircraft may be cleared to land when there is reasonable assurance that the separation will exist when the aircraft crosses the runway threshold, provided that a clearance to land shall not be issued until a preceding landing aircraft has crossed the runway threshold."

According to Paragraph 3-10-6 of Air Traffic Control Procedures (MLTM Notification No. 2015-410/23 June 2015), however, "landing clearance to succeeding aircraft in a landing sequence need not be withheld if you observe the positions of the aircraft and determine that prescribed runway separation will exist when the aircraft crosses the landing threshold. Issue traffic information to the succeeding aircraft if a preceding arrival has not been previously reported, and, as appropriate, hold traffic in position or depart it prior to the succeeding aircraft's arrival, (provided that this Paragraph is not applicable to civil airports)." Therefore, military airports are subject to Paragraph 3-10-6.

1.18.1.3 Traffic Information

Paragraph 3-1-6 of Air Traffic Control Procedures (MLTM Notification No. 2015-410/23 June 2015) prescribes the following:

b. Describe the relative position of traffic in an easy to understand manner, such as "to your right" or "ahead of you."

Example: “Traffic, U.S Air MD-Eighty on downwind leg to your left.”
“Asiana fourteen twenty four inbound from outer marker on straight-in approach to runway two four.”

1.18.1.4 Appropriate ATC Phraseology

Paragraph 3-1-6 of Air Traffic Control Procedures (MLTM Notification No. 2015-410/23 June 2015) specifies the following:

a. Use the word “immediately” only when expeditious compliance is required to avoid an imminent situation;

b. Use the word “expedite” only when prompt compliance is required to avoid the development of an imminent situation. If an “expedite” climb or descent clearance is issued by ATC, and subsequently the altitude to maintain is changed or restated without an expedite instruction, the expedite instruction is canceled; and

c. In either case, if time permits, include the reason for this action.

In addition, Aeronautical Information Manual (AIM, 26 July 2012) specifies the following:

ATC INSTRUCTIONS – Directives issued by air traffic control for the purpose of requiring a pilot to take specific actions; e.g., “Turn left heading two five zero,” “Go around,” “Clear the runway.”

1.18.2 Flight Crew Actions

1.18.2.1 Flight Crew’s Response to Traffic Information

The captain visually confirmed the traffic information given by the Cheongju Tower and immediately acknowledged it. The FO also heard communications exchanges between the captain and the Cheongju Tower, but, at the time, it was difficult for him to visually check the information because he was concentrating his attention on flight control to manually land the aircraft which was descending through 1,000 ft, while maintaining landing configuration and observing the runway.

According to the statement of the captain, he visually identified the fighter jet turning base to final in a visual traffic pattern, but thought that it would naturally land on runway 24L. Also, he and the FO, since they received a clearance to land on runway 24R, concentrated their attention on flying and monitoring the aircraft.

1.18.2.2 Constant Monitoring of Traffic Information

According to the statement of the captain, if the Cheongju Tower had instructed him to approach and land under VFR, he would have constantly monitored traffic information and kept in mind the possibility of separation, avoidance, and go-around, but at that time, since HL8292 was operating under IFR and issued a clearance to land, he had no obligation to constantly monitor the traffic information and perform avoidance.

Further, he landed the aircraft because there had been no traffic on the runway when he had visually checked the runway before landing and because HL8292 received a landing clearance, and although the Cheongju Tower did not inform him of the fighter jet at the end of the runway, he recognized it by visually identifying a yellow brake parachute attached to the jet, after landing.

After the captain was informed of the preceding fighter jet by the Cheongju

Tower, he failed to check whether it would actually land on runway 24L or 24R. In addition, after he reported his visual identification of the fighter jet to the Cheongju Tower, he just concentrated on landing maneuvers, thereby failing to observe it constantly.

1.18.2.3 Failure to Make Go-around

According to the statement of the captain, although he was informed of the traffic information that the preceding fighter jet would land, he thought that it would naturally land on runway 24L, and if he had recognized, by constantly monitoring the fighter jet, that the spacing between the two had been narrower, he would have made go-around. Even if the Cheongju Tower had issued the fighter jet a landing clearance to 24R, however, he would have proceeded with the landing anyway because he would have thought that the Cheongju Tower must have issued the clearance only after ensuring enough separation between HL8292 and the fighter jet.

Further, if he had recognized the presence of the fighter jet on runway 24R before landing, he would have naturally made go-around, but it was difficult for him to visually identify it because the fighter jet was painted a similar color to that of the runway and was small.

Although the captain was cleared to land on runway 24R by the Cheongju Tower, he did not check whether there was an obstacle on the runway, his aircraft could touch down in its touchdown zone, the landing runway was really 24R, or any other aircraft is on the runway, thereby resulting in his failure to prepare for the possible go-round.

1.18.2.4 Deceleration after Landing

According to the statement of the captain, in case of landing on runway 24R, the aircraft should turn 180° at the end of the runway, taxi backwards until taxiway, and move to the aircraft stand for civil aviation via taxiway, and thus, after landing, he slowly decelerated the aircraft and when he found the fighter jet on the runway, he immediately disengaged the autobrake and stopped the aircraft by using the manual brake.

Until HL8292 came to a full stop, the tower controller failed to inform HL8292 of the presence of the fighter jet and instead, advised HL8292 to turn 180° at the end of the runway, taxi backwards, and vacate the runway via taxiway.

HL8292, after confirming the fighter jet had vacated runway 24R, taxied to the end of the runway, turned 180°, taxied backwards, and vacated the runway.

2. Analysis

2.1 General

The ARAIB analyzed relevant factors to determine the causes of the serious incident in which HL8292 had landed on the runway used by a fighter jet at Cheongju Airport and come within about 3,000 ft of the preceding jet.

2.2 The Air Traffic Controller

2.2.1 Failure to Apply Separation of Preceding Aircraft from Arriving Aircraft

In this serious incident, Cheongju Airport's tower controller issued a landing clearance to HL8292 by applying Paragraph 3-10-6 of Air Traffic Control Procedures to clear the aircraft for landing at a military airport for a prompt landing.

However, although the preceding fighter jet has yet to vacate the runway and the separation of the succeeding HL8292 from the jet has yet to be assured, the tower controller failed to advise HL8292 to decelerate during approach or make go-around, so it is necessary for him to receive training on arrival separation.

2.2.2 Failure to Provide Appropriate Traffic Information

The tower controller at Cheongju Airport operating double runways 24R and 24L provided the succeeding HL8292 with traffic information on the preceding fighter jet, but it was not specific enough to cover the jet's landing runway direction and landing type.

As a result, this made the flight crew of HL8292 think that the fighter jet

would land on 24L which was preferentially used by fighter jets, and when it comes to providing traffic information to HL8292, the tower controller needed not only to sequence air traffic but also to give appropriate information so that the flight crew could be fully aware of their traffic situation.

Also, although the fighter jet landing under VFR in a visual traffic pattern and HL8292 making a straight-in approach under IFR on the final approach attempted to land and approach on the same runway, respectively, while using different radio frequencies, the tower controller provided only HL8292 with traffic information on the preceding fighter jet, but not the jet with information on the succeeding HL8292.

When providing traffic information to aircrafts using different radio frequencies, the tower controller needed to give it appropriately to each aircraft so that they could recognize their traffic situation.

2.2.3 Use of Appropriate ATC Phraseology

When the preceding fighter jet has yet to vacate the runway and the succeeding HL8292 was expected to come closer to it on the same runway, the tower controller instructed the taxiing jet to “taxi without delay.” [20)]

This instruction is appropriate when it comes to instructing an aircraft to taxi or roll, but if an aircraft has not promptly vacated the runway yet or if a succeeding aircraft has come closer to a preceding aircraft on the same runway due to a violation of the same runway separation, appropriate action for a tower controller is to use the term “immediately” when giving an air traffic advisory.

2.3 The Flight Crew

20) It is used as “taxi fast” in the Air Force.

2.3.1 Failure to Confirm Inappropriate Traffic Information

When the tower controller in Cheongju Airport operating double runways (24R and 24L) provided the succeeding HL8292 with traffic information on the preceding fighter jet, he failed to inform it of the fighter jet's landing runway direction and landing type.

The captain given traffic information on the preceding fighter jet failed to check the tower controller for the specifics. Also, based on his prior knowledge that fighter jets preferentially land on runway 24L in Cheongju Airport, he concluded that the preceding fighter jet would land on runway 24L, thereby failing to give attention to the issued traffic information.

Since the captain had full responsibility for and ultimate authority over aircraft's safe operation, he needed to actively confirm whether the fighter jet would land on runway 24R or 24L after having given relevant traffic information by the tower controller.

2.3.2 Difference in Recognition of the Term Traffic Information

Chapter 1, Definitions of ICAO Annex 11, Air Traffic Services specifies the following: Traffic information is information issued by an air traffic services unit to alert a pilot to other known or observed air traffic which may be in proximity to the position or intended route of flight and to help the pilot avoid a collision.

The captain of HL8292 needed to recognize that traffic information or advice given by an air traffic services unit was not merely a piece of simple information or advice but could pose a risk to air safety, and thus, to pay attention to the fighter jet's maneuver. In addition, he failed to check whether there was any obstacle or aircraft on the landing runway.

3. Conclusions

3.1 Findings

1. The flight crew held valid qualification certificates required for operation. They were not involved in any unusual activities before flight, and health problems that could have affected the flight were not found.

2. When HL8292 communicated with the Cheongju Ground Approach Control and the Cheongju Tower to approach and land at Cheongju Airport, no problems with any communications equipment were reported.

3. HL8292 reported runway in sight on the final approach course about 10 miles from the facility, and was given traffic information that there were two fighter jets in a visual traffic pattern and that HL8292 was number 3. After this, the control of the flight was transferred to the Cheongju Tower.

4. When HL8292 was on final approach course about 7 miles from the facility, the tower controller cleared traffic No. 2, fighter jet, for landing on runway 24R.

5. After the captain was informed of the preceding fighter jet by the Cheongju Tower, he failed to check which of the runways it would land on and to monitor its maneuver constantly.

6. After the captain was informed of the preceding fighter jet by the Cheongju Tower, he failed to anticipate its possible landing on runway 24R and check its presence on the runway.

7. After landing, the captain found the fighter jet still on runway 24R, so

stopped HL8292 on the same runway by using a quick brake, but the aircraft came within about 3,000 ft (1,000 m) of the fighter jet.

8. Although there was possibility that the two aircafts would get near to each other on runway 24R, the tower controller failed to inform HL8292 not only of the fighter jet's forthcoming landing on runway 24R but also of its presence on the runway after landing.

9. When the tower controller intended to instruct the preceding fighter jet to immediately vacate the runway, he needed to use the term "immediately" rather than "taxi without delay."

10. The tower controller failed to actively provide air traffic control services to HL8292, such as an instruction to decelerate on the final approach course, to prepare for the possibility that the separation of the succeeding HL8292 from the preceding fighter jet would not be maintained.

11. Although the preceding fighter jet which had landed on runway 24R was expected not to have vacated the runway, the tower controller failed to immediately instruct HL8292 to make go-around.

3.2 Probable Cause

The Aviation and Railway Accident Investigation Board (ARAIB) determined that the probable causes of this serious incident were「① the misjudgment and inattention of the tower controller who failed to instruct HL8292 to reduce an approach speed or make go-around to prepare for the possibility that the preceding fighter jet and the succeeding HL8292 would get near to each other o the same runway; and ② the inattention of the flight crew who failed to check the fighter jet's landing runway direction (24R) and observe the fighter jet

constantly.」

Contributing to the serious incident were (1) the tower controller's failure to provide HL8292 with traffic information on the preceding fighter jet's landing runway direction (24R); and (2) the tower controller's inadequate use of ATC phraseology when instructing the fighter jet to vacate the runway.

4. Safety Recommendations

As a result of the investigation of the May 28, 2015, HL8292 serious incident, the Aviation and Railway Accident Investigation Board makes the following safety recommendations:

4.1 To the ROK Air Force (Cheongju Control Tower)

1. Train your air traffic controllers to ensure that, if the minimum separation of the preceding aircraft from the succeeding aircraft on the same runway is not maintained, they actively instruct the succeeding aircraft to reduce an approach speed or make go-around. (AIR-1504-1)

2. Provide appropriate traffic information to the flight crew so that they can fully recognize and respond to a traffic situation. (AIR-1504-2)

3. When intending to instruct an aircraft to immediately vacate a runway, use the term “immediately” rather than “taxi without delay.” (AIR-1504-3)

4.2 To Eastar Jet

1. Train your flight crew to ensure that, when given an inadequate ATC instruction or traffic information, they always verify and respond to it, instead of making a decision based on their prior experiences. (AIR-1504-4)