

AI2023-8

**AIRCRAFT SERIOUS INCIDENT  
INVESTIGATION REPORT**

**Fuji Dream Airlines Co., Ltd.  
J A 1 0 F J**

**December 21, 2023**



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.

TAKEDA Nobuo  
Chairperson  
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.

《Reference》

The terms used to describe the results of the analysis in "3. ANALYSIS" of this report are as follows.

- i) In case of being able to determine, the term "certain" or "certainly" is used.
- ii) In case of being unable to determine but being almost certain, the term "highly probable" or "most likely" is used.
- iii) In case of higher possibility, the term "probable" or "more likely" is used.
- iv) In a case that there is a possibility, the term "likely" or "possible" is used.

# AIRCRAFT SERIOUS INCIDENT INVESTIGATION REPORT

ATTEMPT OF LANDING ON A RUNWAY  
BEING USED BY OTHER AIRCRAFT ETC.

FUJI DREAM AIRLINES CO., LTD.

EMBRAER ERJ170-200STD, JA10FJ

HYAKURI AIRFIELD

AT ABOUT 14:50 JST, MAY 20, 2022

November 24, 2023

Adopted by the Japan Transport Safety Board

Chairperson	TAKEDA Nobuo
Member	SHIMAMURA Atsushi
Member	MARUI Yuichi
Member	SODA Hisako
Member	NAKANISHI Miwa
Member	TSUDA Hiroka

## 1. PROCESS AND PROGRESS OF THE AIRCRAFT SERIOUS INCIDENT INVESTIGATION

<b>1.1 Summary of the Serious Incident</b>	<p>On May 20, Friday, 2022, at Hyakuri Airfield, after receiving a landing clearance from an air traffic controller, an Embraer ERJ170-200STD, JA10FJ, operated by Fuji Dream Airlines Co., Ltd., attempted to land on Runway 21R where there was a vehicle.</p>
<b>1.2 Outline of the Serious Incident Investigation</b>	<p>The occurrence covered by this report falls under the category of “Attempt of landing on a runway being used by other aircraft etc.” as stipulated in item (ii), Article 166-4 of the Ordinance for Enforcement of Civil Aeronautics Act of Japan (Ordinance of Ministry of Transport No.56 of 1952), and is classified as a serious incident.</p> <p>On May 20, 2022, the Japan Transport Safety Board (JTSB) designated an investigator-in-charge and two other investigators to investigate this serious incident.</p> <p>Although this serious incident was notified to the Federative Republic of Brazil, as the State of Design and Manufacture of JA10FJ, the State did not designate its accredited representative.</p>

Comments on the draft Final Report from parties relevant to the cause of the serious incident were invited. Comments on the draft Final Report from the relevant State were invited.

## 2. FACTUAL INFORMATION

### 2.1 History of the Serious Incident

According to the statements of the pilot in charge (PIC) and the First Officer (FO) of Embraer ERJ170-200STD, JA10FJ (hereinafter referred to as “Aircraft A”), operated by Fuji Dream Airlines Co., Ltd., two squadron members in the inspection vehicle (hereinafter referred to as “the Vehicle”) belonging to Civil Engineering Squadron of Japan Air Self-Defense Force (JASDF) the 7th Air Wing Air Base Group (hereinafter referred to as “the Engineers”), the air traffic controller in charge of the tower control position (hereinafter referred to as “Controller A”), the air traffic controller in charge of supervising the training at the ground control position (hereinafter referred to as “Controller B”), the air traffic controller taking on-the-job training at the ground control position (hereinafter referred to as “Trainee C”), the air traffic controller in charge of supervising the training (hereinafter referred to as “Controller D”) at the coordinator position (hereinafter referred to as “the Coordinator”), the air traffic controller taking on-the-job training at the Coordinator (hereinafter referred to as “Trainee E”), and the air traffic controller who had been taking on-the-job training at the ground control position before Trainee C (hereinafter referred to as “Trainee F”) at Hyakuri Airfield Traffic Control Tower at the time of the serious incident, as well as the records on the flight data recorder of Aircraft A, the records of air traffic control (ATC) communication, vehicle radio communication, land-line phone communication and radar track, the history of the serious incident is summarized as follows:



Figure 1: Aircraft A



Figure 2: The Vehicle

(1) From about 11:45 Japan Standard Time (JST: UTC+9 hours; unless otherwise noted, all times are indicated in JST in this report on a 24-hour clock) on the day of the serious incident, Controller A, Controller B, Trainee C, Controller D, Trainee E and Trainee F were providing the aerodrome control services and conducting on-the-job training at the airfield traffic control tower.



Figure 3: Hyakuri Airfield Traffic Control Tower

At 13:45, Aircraft A took off from Hiroshima Airport as a charter flight with 47 people on board, consisting of the PIC, three other crew members and 43 passengers, and was flying toward Hyakuri Airfield.

The two Engineers got on the Vehicle to conduct a daily inspection for the aircraft arresting barrier\*<sup>1</sup> (hereinafter referred to as “the Barrier”) of Runway 21R, called a ground control position from the Self-Defense Forces (SDF) apron at 13:47, and moved and stopped short of the runway after being cleared. At 13:50, the Vehicle was comprehensively permitted by the ground control position to enter the runway for the inspection of the Barrier, and entered (Figure 4 ①). After conducting the inspection of “Southwest Barrier” located in the south side overrun area on the runway, the Vehicle headed for the north side overrun area through the runway for the inspection of “Northwest Barrier” (Figure 4 ②).

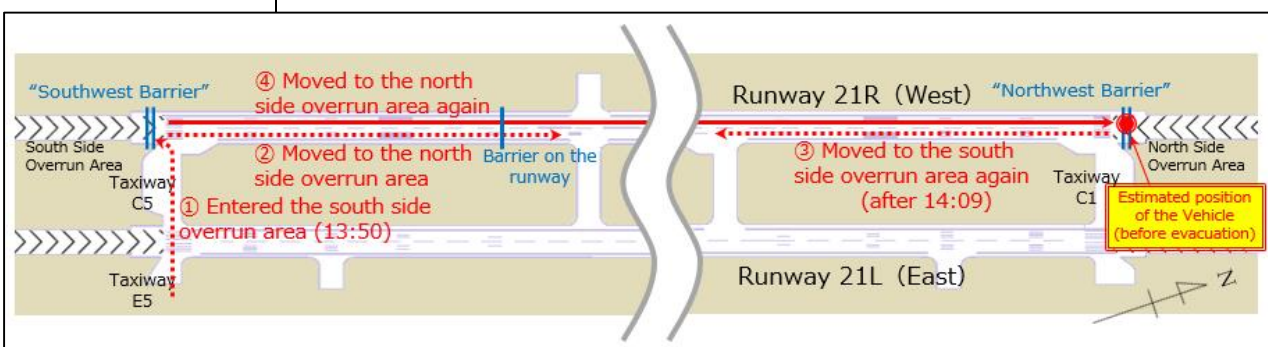


Figure 4: Movements of the Vehicle

(2) As of 13:49, Controller D was seated at the tower control position, Controller B and Trainee F at the ground control position, and Controller A at the Coordinator. Controller B was also served as the watch

\*<sup>1</sup> The “aircraft arresting barrier” refers to a braking system installed in runways and overrun areas in order to decelerate / stop an aircraft in an emergency landing or an aborted take-off, which is for some SDF aircraft. At Hyakuri Airfield, the system is installed on both runways, and on Runway 21R, it is installed three locations in total, one on the south side and one in each of both overrun areas.

supervisor position at the airfield traffic control tower. Trainee C and Trainee E were observing the ATC operations in the rear, away from the control position.

At 13:50 (Figure 5), when the Vehicle requested the ground control position to grant it a permission to enter Runway 21R, Trainee F was temporarily away from the ground control position, and Controller B issued the runway entry permission to the Vehicle with the approval by Controller D in charge of the tower control position. Controller B set two types of reminders (described later in 2.7 (3)) indicating that the runway was not available for take-off and landing of aircraft. Controller D also set two types of reminders, and Controller A one type, respectively.

At 14:06 (Figure 6), in order to inspect the operating conditions of “Northwest Barrier”, the Vehicle requested the ground control position to raise the Barrier (UP). Upon receiving this request, Trainee F asked Controller D to get the Barrier up, and at about 14:07, Controller D got the Barrier up. At 14:08, the Vehicle requested the ground control position to retract the Barrier (Down). Upon receiving this request, Trainee F asked Controller D to retract the Barrier, and Controller D got the Barrier down at about 14:09. After the inspection of “Northwest Barrier”, the Vehicle left the north side overrun area once in order to conduct inspection of “Southwest Barrier” again, and headed for

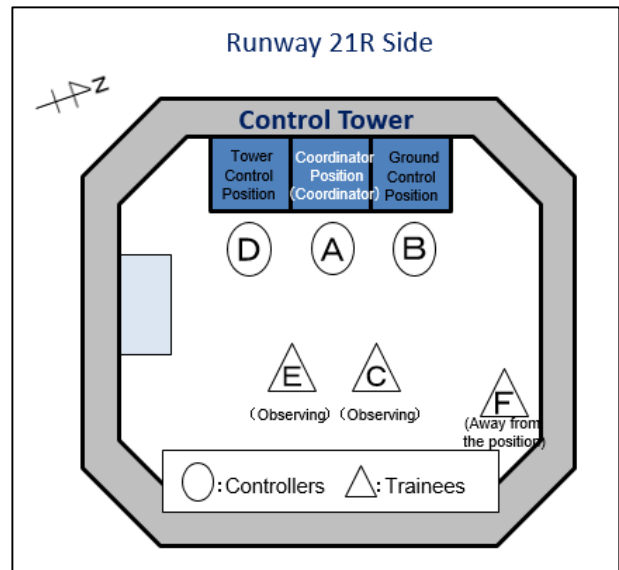


Figure 5: Situation of the Control Tower at 13:50 (when the Vehicle obtained the permission to enter Runway 21R)

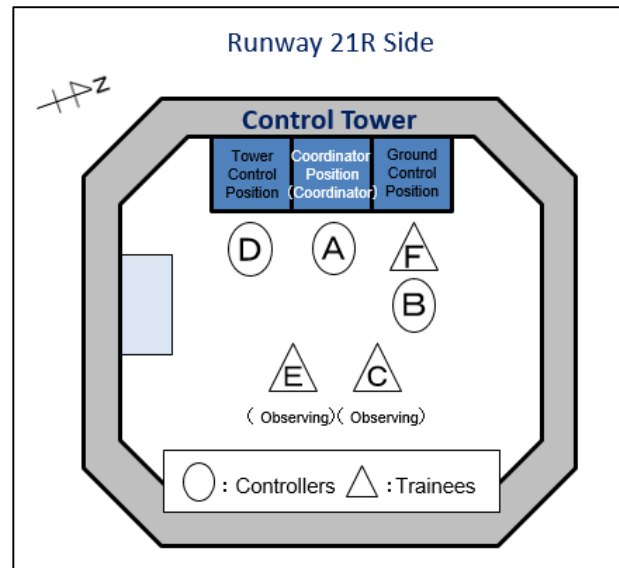


Figure 6: Situation of the Control Tower at 14:06 (at the time of the Northwest Barrier up/down)

the south side overrun area via the runway (Figure 4 ③).

- (3) At about 14:10 (Figure 7), Controller A and Controller D rotated their control positions in charge, and Trainee C got seated at the ground control position, Trainee E at the Coordinator, respectively. Controller B continued to stay at the ground control position. Trainee F completed the on-the-job training and left the tower.

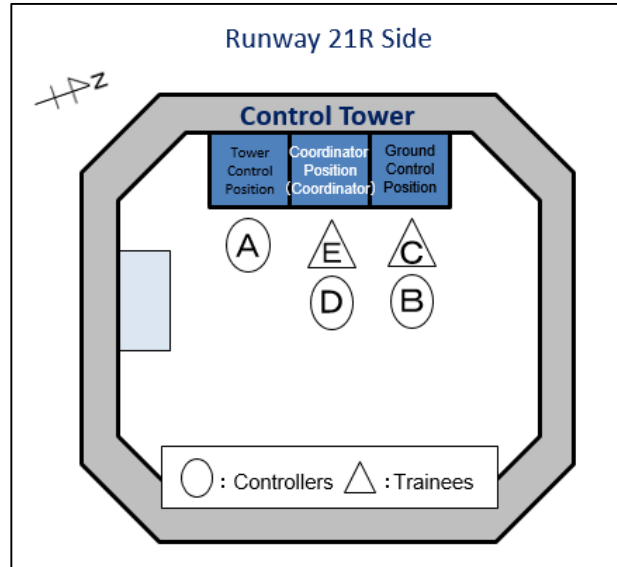


Figure 7: Situation of the Control Tower after 14:10 (at the time of the serious incident)

A short time after a while rotating the position, Trainee E noticed that there might be multiple errors in the radio log and consulted with Controller D. Controller D confirmed they were errors, and pointed out to Controller A, who had written the relevant part, that there were errors in the radio log. After that, Controller D and Trainee E continued to check the radio log. Controller B was making oral confirmation of Trainee C's knowledge on traffic control services in between their ground control service duties.

At about 14:39, from Hyakuri Radar Approach Control Facility\*2 the information related to Aircraft A's approach procedure was notified to the airfield traffic control tower via the Coordinator. Just around the same time, a departure aircraft to take off from Runway 21L (hereinafter referred to as "Aircraft B") commenced taxiing from the SDF apron. Upon this, Controller B, as watch supervisor, confirmed with Controller A about the ATC plan for those two aircraft, considering that there might be a possibility that the timing of Aircraft B's take-off and Aircraft A's landing could overlap, although their runways to be used were different. Controller A was a little confused about the ATC plan, but as Aircraft B became ready for departure at 14:43, Controller A was able to issue take-off clearance to Aircraft B without affecting Aircraft A's landing. Aircraft B took off and left the tower control frequency at 14:46.

- (4) At 14:38, Aircraft A established communication with Hyakuri Radar Approach Control Facility, and at 14:44, it received an approach clearance for Runway 21R. At about 14:45, when Aircraft A reached approximately 15 nm (approx. 27.8 km) from Hyakuri Airfield, the radar

\*2 "Hyakuri Radar Approach Control Facility" refers to the ATC facility to perform the terminal radar control service and approach control service mainly for departing/arriving aircraft at the airfield.

approach control facility informed the airfield traffic control tower of the position of Aircraft A through CLS\*3. According to normal procedures, Controller A responded through CLS that the position of Aircraft A was confirmed. While approaching the runway, Aircraft A established communication with Controller A at 14:45:34. Controller A instructed Aircraft A to report its passing Fix\*4 “MAGRY” (7.5 nm (approx. 13.9 km) from the threshold of the runway).

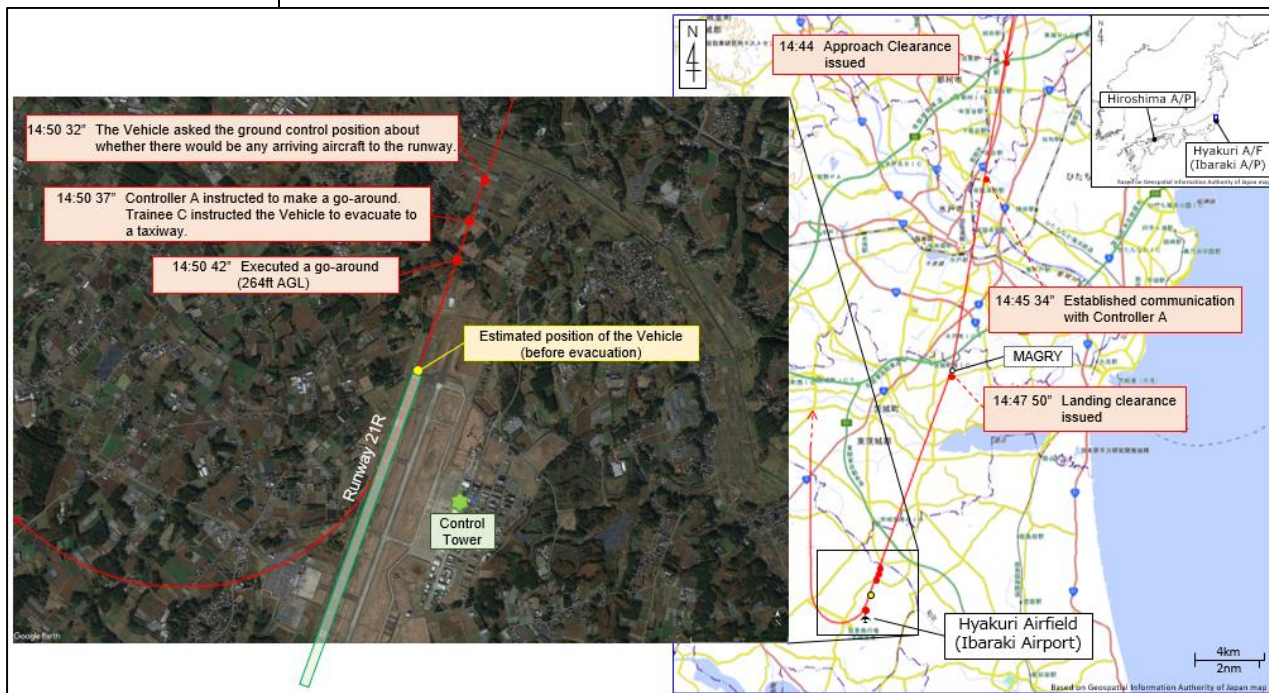


Figure 8: Aircraft A's Estimated Flight Route

Preparing for Aircraft A's landing, Controller A scanned there would be no obstacles on and around the runway through binoculars, but was unable to visually recognize the Vehicle. Controller B, as watch supervisor, also scanned the presence of obstacles on and around the runway and the conditions of necessary aerodrome lighting, but was unable to visually recognize the Vehicle. Five controllers, including those two controllers, at the control tower did not see the reminders that had been set on each control console, and were unable to recall that the Vehicle had entered the runway.

At 14:47:47, Aircraft A reported to Controller A that it had passed “MAGRY”. Upon receiving this report, Controller A issued a landing clearance for the runway to Aircraft A at 14:47:50.

\*3 “CLS (Clearance Lighting System)” refers to the equipment used to report the position of arriving aircraft and coordinate landing clearances in ground controlled approach services. Hyakuri Radar Approach Control Facility and the airfield traffic control tower also use the system to report the position of arriving aircraft, other than in the case of ground controlled approach services. When an arriving aircraft reaches the point of 15 nm from the runway, the terminal control facility activates the system to flash lightings at tower control position and sound a beep. The tower control position uses the response button to inform the terminal control facility that the report has been received.

\*4 “Fix” refers to a geographical specific position obtained by means of visual reference to the surface, utilization of radio facilities, celestial navigation and others.



	<p>The Vehicle returned from the south side overrun area to the north side one through the runway in order to conduct inspection of “Northwest Barrier” again (Figure 4 ④), and stopped facing almost northward. When the two Engineers were going to get off the Vehicle, one of them found an aircraft ahead over the sky. At 14:50:32, the one Engineer asked the ground control position about whether there would be any arriving aircraft to the runway after consulting with the other Engineer. Almost at the same time, the Vehicle started to move while turning left to prepare for the ground control position’s instruction to vacate the runway.</p> <p>Upon receiving the inquiry from the Vehicle, Trainee C instructed the Vehicle to evacuate to a taxiway at 14:50:37, and Controller B, as watch supervisor, urged Controller A to have Aircraft A make a go-around. As having listened to the inquiry from the Vehicle through the speaker, Controller A also instructed Aircraft A to make a go-around almost at the same time. At 14:50:42, Aircraft A made a go-around and commenced to climb.</p> <p>After the go-around, Aircraft A turned to the west side of the airfield, its communication was transferred to Hyakuri Radar Approach Control Facility, then Aircraft A received an approach clearance again for the runway by the radar approach control facility, and landed at 15:01.</p>																																						
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<b>2.3 Damage to the Aircraft</b>	None																																						
<b>2.4 Personnel Information</b>	<table border="0"> <tr> <td>(1) Controller A</td> <td style="text-align: right;">Age: 28</td> </tr> <tr> <td style="padding-left: 20px;">Air Traffic Control Certificate</td> <td style="text-align: right;">March 3, 2020</td> </tr> <tr> <td style="padding-left: 20px;">Aerodrome Control Service</td> <td style="text-align: right;">March 3, 2020</td> </tr> <tr> <td style="padding-left: 20px;">Medical Examination Certificate</td> <td style="text-align: right;">Validity: August 14, 2022</td> </tr> <tr> <td>(2) Controller B</td> <td style="text-align: right;">Age: 30</td> </tr> <tr> <td style="padding-left: 20px;">Air Traffic Control Certificate</td> <td style="text-align: right;">June 19, 2012</td> </tr> <tr> <td style="padding-left: 20px;">Aerodrome Control Service</td> <td style="text-align: right;">June 19, 2012</td> </tr> <tr> <td style="padding-left: 20px;">Medical Examination Certificate</td> <td style="text-align: right;">Validity: May 27, 2023</td> </tr> <tr> <td>(3) Trainee C</td> <td style="text-align: right;">Age: 21</td> </tr> <tr> <td style="padding-left: 20px;">Basic Examination Certificate</td> <td style="text-align: right;">February 2, 2021</td> </tr> <tr> <td style="padding-left: 20px;">Medical Examination Certificate</td> <td style="text-align: right;">Validity: February 18, 2023</td> </tr> <tr> <td>(4) Controller D</td> <td style="text-align: right;">Age: 25</td> </tr> <tr> <td style="padding-left: 20px;">Air Traffic Control Certificate</td> <td style="text-align: right;">September 3, 2018</td> </tr> <tr> <td style="padding-left: 20px;">Aerodrome Control Service</td> <td style="text-align: right;">September 3, 2018</td> </tr> <tr> <td style="padding-left: 20px;">Medical Examination Certificate</td> <td style="text-align: right;">Validity: September 9, 2022</td> </tr> <tr> <td>(5) Trainee E</td> <td style="text-align: right;">Age: 29</td> </tr> <tr> <td style="padding-left: 20px;">Air Traffic Control Certificate</td> <td style="text-align: right;">September 16, 2014</td> </tr> <tr> <td style="padding-left: 20px;">Aerodrome Control Service</td> <td style="text-align: right;">September 16, 2014</td> </tr> <tr> <td style="padding-left: 20px;">Medical Examination Certificate</td> <td style="text-align: right;">Validity: March 8, 2023</td> </tr> </table>	(1) Controller A	Age: 28	Air Traffic Control Certificate	March 3, 2020	Aerodrome Control Service	March 3, 2020	Medical Examination Certificate	Validity: August 14, 2022	(2) Controller B	Age: 30	Air Traffic Control Certificate	June 19, 2012	Aerodrome Control Service	June 19, 2012	Medical Examination Certificate	Validity: May 27, 2023	(3) Trainee C	Age: 21	Basic Examination Certificate	February 2, 2021	Medical Examination Certificate	Validity: February 18, 2023	(4) Controller D	Age: 25	Air Traffic Control Certificate	September 3, 2018	Aerodrome Control Service	September 3, 2018	Medical Examination Certificate	Validity: September 9, 2022	(5) Trainee E	Age: 29	Air Traffic Control Certificate	September 16, 2014	Aerodrome Control Service	September 16, 2014	Medical Examination Certificate	Validity: March 8, 2023
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<b>2.5 Aircraft</b>	(1) Aircraft A																																						

<p><b>Information</b></p>	<p>Aircraft type: Embraer ERJ170-200STD  Serial number: 17000516  Date of manufacture: February 28, 2016  Airworthiness certificate: Dai-2018-614</p> <p>(2) The Vehicle  Owner: Civil Engineering Squadron of JASDF  the 7th Air Wing Air Base Group  Vehicle type: Truck with crane  Color: Olive Drab (dark green)</p>
<p><b>2.6 Meteorological Information</b></p>	<p>The observation data in the aerodrome routine meteorological report at the airfield at around the time of the serious incident was as follows:  15:00 Wind direction: 160°, Wind velocity: 5 kt  Wind direction fluctuation 110° to 190°  Prevailing visibility: 10 km or more  Clouds: Amount 1/8, Type Cumulus, Cloud base 2,000 ft  Amount 8/8, Type Unknown, Cloud base 21,000 ft</p>
<p><b>2.7 Additional Information</b></p>	<p>(1) The Airfield  The airfield, which was established by the SDF and used also by civil aircraft, has two runways with 2,700 m in length and 45 m in width (03R/21L on the east side runway and 03L/21R on the west side runway). In principle, the east side runway is used by the SDF aircraft and the west side runway is used by the civil aircraft. The aerodrome control services at the airfield are provided by the Hyakuri ATC Squadron of JASDF Air Support Command (ASC) Air Traffic Control Service Group (hereinafter referred to as “Hyakuri ATC Squadron”). The control tower is located almost in the center on the east of the east side runway.</p> <p>(2) Daily Inspections of the Barriers by Inspection Vehicle  Daily inspections of the Barriers by inspection vehicle for the west side runway are conducted from 13:30 as its target time to start. Usually, there are no scheduled commercial flights to take off or land during this time period. In the inspection of the Barrier of the west side runway, the inspection vehicle would run via the taxiway from the SDF apron, cross the east side runway, and enter the west side runway from the south side.</p> <p>As the Engineers in the inspection vehicle do not have the information on the using runway and whether there are aircraft to take off and land, they are supposed to always conduct the inspection according to the instructions or permission from the air traffic controllers (hereinafter referred to as “Controllers”) at the airfield traffic control tower. Besides, as runway entry is usually granted comprehensively for the inspection operation without specifying the travel route or inspection area and time, etc., the radio communication from the inspection vehicle to the airfield traffic control tower is usually performed only when requesting the airfield traffic control tower to raise or retract the Barrier for the inspection of the operating conditions from the time the inspection vehicle enters the west runway until it leaves. The required time until the</p>

completion of inspection of all the Barriers was normally about one hour if there would be no particular trouble.

### (3) Reminders



Figure 9: Reminders used at the airfield traffic control tower (from left, at the tower control position, at the Coordinator, and at the ground control position)

The Operation Processing Procedures specified by Hyakuri ATC Squadron stipulates that in case where the runway is not available for take-off and landing of aircraft, reminders shall be set at control positions designated by the watch supervisor, and at the airfield traffic control tower, the five kinds of reminders were supposed to be set at the tower control position, ground control position and the Coordinator by using sheets and magnets, etc.

Besides, airport traffic control towers where air traffic control services are provided by the Civil Aviation Bureau (CAB) have such an operational example that when the runway is not available for take-off and landing of aircraft due to closure of the runway, etc., the tower control position shall cover the display screen of the anemometer necessary for the issuance of take-off and landing clearance with a reminder, and as long as the reminder is set there, the take-off and landing clearance related to the runway cannot be issued so that the reminder can function as a “Stopper”. The display device of the anemometer at Hyakuri Airfield Traffic Control Tower are commonly used for the two runways, and even if one runway is not available for take-off and landing of aircraft, in preparation to use the other one, therefore, the reminders that cover the anemometer display device were not set.

### (4) Traffic Condition and Personnel Assignment

On the day of the serious incident, the flight training conducted by the aircraft belong to JASDF Hyakuri Base had completed by 13:00, afterword, the airfield was in lightly trafficked conditions. In the prework briefing, the information on the flight schedule of Aircraft A, which was a charter flight, was shared among related Controllers, and a warning was also given to them about the possibility of overlapping with the Barrier inspection times.

In Hyakuri ATC Squadron, if there is no flight training, the watch supervisor is supposed to be able to concurrently serve at the control position. In addition, in principle, there is no restriction on conducting on-the-job training except when handling aircraft in emergency situations,

### 3. ANALYSIS

#### (1) Issuing of Landing Clearance for the Runway Where There is a Vehicle

The JTSTB concludes that it is certain that when the Vehicle was conducting the Barrier inspection on Runway 21 and its vicinity after receiving the runway entry permission, Controller A issued a landing clearance for the runway to Aircraft A.

The reason why Controller A issued the landing clearance for the runway to Aircraft A even though the Vehicle was entering the runway and its vicinity was most likely because Controller A had forgot the existence of the Vehicle, and because Controller B, who was seated at the ground control position in charge of the radio communication with the Vehicle, had also forget the existence of the Vehicle and was unable to complement the services of tower control position.

Why Controller A and B forgot the existence of the Vehicle was more likely because the runway entry permission was comprehensively granted while they had little opportunity to be aware of the presence of inspection vehicles as civilian aircraft rarely arrived during the Barrier inspections on a daily basis, and therefore, as there was no communication between the Vehicle and the airfield traffic control tower for about 40 minutes after the coordination was completed for raising and retracting the Barrier, and they did not have to coordinate anything about the Vehicle among control positions in the tower, which caused their awareness of the Vehicle to gradually fade away. Besides, as Aircraft B, whose take-off timing could have overlapped with Aircraft A's landing, took off, the possibility of affecting the landing of Aircraft A was relieved, in addition, the on-the-job trainings were conducted at all the control positions except the tower control position in which Controller A was engaged, which possibly reduced Controller A's attention to the runway and caused Controller A to forget the existence of the Vehicle on the runway.

It is important for the Controllers engaged in the services at the tower control position, not limited to cases where landing and take-off clearances are issued, to always grasp the conditions of obstacles on the runway and its vicinity surely and continuously, and always be prepared to take appropriate actions if necessary.

Why Controller A and B were unable to visually recognize the Vehicle was more likely because without being conscious of the Vehicle's presence, both controllers scanned the runway and its vicinity.

#### (2) Comprehensive Permission Related to Runway Entry

The JTSTB concludes that as described in (1), after the runway entry permission was comprehensively given to the Vehicle, there was no communication with the Vehicle for about 40 minutes, which probably contributed to Controllers at the airfield traffic control tower forgetting the existence of the Vehicle. When the runway entry permission is comprehensively given to the Vehicle that is expected to take about one hour to complete the inspection work as in experience, it was necessary for the airfield traffic control tower to have probably considered and taken effective measures to prevent forgetting such as instruction of fixed-point reporting and others.

#### (3) Reminders

The JTSTB concludes that it is probable that although in the airfield traffic control tower, reminders set at each control position would be used in case where the runway is not available for take-off and landing of aircraft, and aerodrome control services would be provided while grasping the situation on the runway and its vicinity, the actions to set those reminders had

became a mere formality. It is desirable for Hyakuri ATC Squadron to repeatedly inform all the Controllers who provide ATC services at the airfield traffic control tower of the back ground leading up to the use of reminders and the significance of their use, and to consider and practice the method of use that can prevent it from becoming merely a formality. Besides, various creative examples of effective use of reminders can be seen also in the ATC facilities of CAB. It is desirable for the ATC facilities of the Ministry of Defense to continue to make a technical exchanging with the ATC facilities of CAB including sharing the information on effective use of reminders, keeping in mind that they are also responsible for the ATC services at airports for joint SDF-civilian use like Hyakuri Airfield.

#### (4) How to Maintain Appropriate Work Environment

The JTSB concludes that when the serious incident occurred, in the airfield traffic control tower, in addition to Controller A and B, there were other three controllers including trainees taking on-the-job training, however, all of them forgot the existence of the Vehicle despite being alerted to the possibility of a charter flight arrival during the Barrier inspection in the briefing, and it was not until they were asked by the Engineers in the Vehicle about whether there would be any arriving aircraft that they noticed the situation where they should not have issued the landing clearance. All Controllers in the airfield traffic control tower were unable to notice the situation where they should not have issued the landing clearance was probably because they were in such a work environment that their situational awareness of the runway and its vicinity was reduced since at multiple control positions, they were conducting the verbal confirmation of the control service knowledge during the on-the-job training or the error checking of the radio log. It is probable that Controller B, watch supervisor in charge of the airfield traffic control tower, should have taken account of maintaining an appropriate work environment so as to ensure the safety on the runway and its vicinity that should be given top priority without decreasing the vigilance of all Controllers even during on-the-job training. While traffic control services are shared and provided by each control position, it is important to complement one another through teamwork, therefore, it is desirable for each controller to monitor the situation of control services at other control positions as much as possible in order to manage human errors.

#### (5) Classification of Severity

The JTSB concludes that the closest distance between Aircraft A and the Vehicle was most likely about 1,000 m (about 0.54 nm).

The serious incident certainly falls under the severity classification of Category C (An incident characterized by ample time and/or distance to avoid a collision) of "the Manual on the Prevention of Runway Incursions" of ICAO with classification tools provided by ICAO. (See Attachment "Severity Classifications of Runway Incursions").

## 4. PROBABLE CAUSES

The JTSB concludes that the probable cause of this serious incident was certainly that when the Vehicle was conducting the Barrier inspection on Runway 21 and its vicinity after receiving the runway entry permission, Controller A issued a landing clearance for the runway to Aircraft A, therefore Aircraft A attempted to landing on the runway.

Controller A gave Aircraft A the landing clearance for the runway where there was the Vehicle was most likely because Controller A had forgot the existence of the Vehicle, and Controller B in

charge of the ground control position had also forgot the existence of the Vehicle and was unable to complement the services of tower control position.

Regarding to Controller A and B forgetting the existence of the Vehicle, after the Vehicle was comprehensively permitted to enter the runway, there was no communication between the Vehicle and the airfield traffic control tower for about 40 minutes, in addition, as multiple on-the-job trainings were conducted at the airfield traffic control tower, the system to complement their ATC services one another became fragile and others, which probably contributed to it.

## 5. SAFETY ACTIONS

<p><b>5.1 Safety Actions Required</b></p>	<p>As described in “3. ANALYSIS”, it is important for the Controllers engaged in the services at the tower control position to grasp the conditions of obstacles on the runway and its vicinity surely and continuously, and always be prepared to take appropriate actions if necessary.</p> <p>Besides, when the runway entry is comprehensively permitted to the Vehicle for long hours, it is necessary to consider and take effective measures to prevent forgetting such as instruction of fixed-point reporting and others.</p>
<p><b>5.2 Safety Actions Taken after the Serious Incident</b></p>	<p>Upon the occurrence of this serious incident, Hyakuri ATC Squadron has taken the following safety actions.</p> <p>(1) Maintaining Awareness (Vigilance)</p> <p>All Controllers providing ATC services at the airfield traffic control tower were instructed to understand that confirming the ATC knowledge while seated at the control position and others would distract and relatively lower their vigilance from the subjects to which they should pay attention, and to devote themselves to providing the traffic control services. In addition, it was decided that TEM training*<sup>5</sup> shall be provided approximately every three months so that Controllers should understand the significance of basic rules related to ensuring safety and heighten the awareness of each Controller.</p> <p>(2) Position Reporting during the Inspection Work Related to Runways</p> <p>It was decided to have the operators of the vehicle for the runway related inspection work make a position reporting when moving the inspection area in order to make it easier to locate the vehicle's position, and receive continuous position reporting in order to prevent from forgetting the vehicle's presence.</p> <p>(3) Improvement of Reminder</p> <p>It was decided to increase the number of the anemometer display devices so as to set the one dedicating to each runway. The reminders that cover the anemometer were introduced in June 2022, and those emitting light and sound in September 2022.</p> <p>(4) Strengthening of Mutually Complementary System</p> <p>It was stipulated that when the tower control position has received a 15 nm position report regarding arriving civilian aircraft, according to a verbal</p>

\*<sup>5</sup> “TEM (Threat and Error Management) Training” refers to the training for developing an ability to quickly detect matters (threat and error) that may lead to accidents, etc. and properly cope with them in order to prevent those accidents, based on human imperfection.

	confirmation by the tower control position, the ground control position shall also make a verbal confirmation of the runway condition. And it was decided that the training and guidance related to human factors and non-technical skills* <sup>6</sup> conducted monthly shall be enhanced so as to increase the sensitivity to a threat as controllers and improve the ability to cope with errors.
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\*<sup>6</sup> “Non-Technical Skills”, which is a generic term that encompasses Communication, Teamwork, Leadership, Situational Awareness, Decision Making and others, are necessary to ensure safety and quality in teamwork along with technical skills such as specialized knowledge and skills.

## Severity Classifications of Runway Incursions

Severity classifications described in ICAO the “Manual on the Prevention of Runway Incursions” (Doc 9870) are as described in the table below.

*Table 6-1 Severity classification scheme*

<i>Severity classification</i>	<i>Description**1</i>
<i>A</i>	<i>A serious incident in which a collision is narrowly avoided.</i>
<i>B</i>	<i>An incident in which separation decreases and there is significant potential for collision, which may result in a time-critical corrective/evasive response to avoid a collision.</i>
<i>C**2</i>	<i>An incident characterized by ample time and/or distance to avoid a collision.</i>
<i>D</i>	<i>An incident that meets the definition of runway incursion such as the incorrect presence of a single vehicle, person or aircraft on the protected area of a surface designated for the landing and take-off of aircraft but with no immediate safety consequences.</i>
<i>E</i>	<i>Insufficient information or inconclusive or conflicting evidence precludes a severity assessment.</i>

\*\*1 See the definition of “incident” of Annex 13.

\*\*2 Shaded to show the pertinent classification of the serious incident.