

AA2023-2

# AIRCRAFT ACCIDENT INVESTIGATION REPORT

**Privately owned**  
**J A 3 8 0 3**

**March 30, 2023**

 **JTTSB** *Japan Transport Safety Board*

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 determine the causes of an accident and damage incidental to such an accident, thereby preventing future accidents and reducing damage. 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 ACCIDENT INVESTIGATION REPORT

## DEATH OF PERSONS CAUSED BY DITCHING

### PRIVATELY OWNED

FUJI FA-200-160, JA3803

ARIAKE SEA, ABOUT 10 KM WEST OF MIIKE PORT,

OMUTA CITY, FUKUOKA PREFECTURE, JAPAN

AT ABOUT 15:45, APRIL 18, 2022

March 10, 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 ACCIDENT INVESTIGATION

<b>1.1 Summary of the Accident</b>	On April 18 (Monday), 2022, a privately owned Fuji-FA-200-160, registered JA3803, took off from Aso Temporary Airfield at around 13:45 (JST: UTC + 9hrs, unless otherwise stated all times are indicated in JST on a 24-hour clock) for a flight training. At about 15:45, the Aircraft ditched into the Ariake Sea about 10 km west of Miike Port in Omuta City, Fukuoka Prefecture, and subsequently submerged under the sea. There were three persons on board the captain as a flight instructor, a student pilot, and a passenger. They were rescued drifting in the sea, the captain and the passenger suffered fatal injuries.
<b>1.2 Outline of the Accident Investigation</b>	The Japan Transport Safety Board (JTSB) designated an investigator-in-charge and an investigator to investigate the accident on April 18, 2022. An accredited representative of the United States of America as the State of Design and Manufacture of the engine of the aircraft participated in the accident investigation. Comments on the draft Final Report were invited from the parties relevant to the cause of the accident and the relevant state.

## 2. FACTUAL INFORMATION

<b>2.1 History of the Flight</b>	(1) Summary
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According to the statements of the student pilot (hereinafter referred to as “the Trainee”), the accident aircraft co-owner (hereinafter referred to as “the Person A”) who was at Aso Temporary Airfield (hereinafter referred to as “the Airfield”) on the day of the accident and the mechanic of the accident aircraft (hereinafter referred to as “the Person B”), and radar track records, the history of the flight is summarized below.

At about 13:45, on April 18, 2022, a privately owned Fuji-FA-200-160, registered JA3803, took off from the Airfield as the 1st flight of the day, with the Trainee in the left pilot seat, the captain as a flight instructor in the right pilot seat, and the passenger in the left rear seat.



Figure 1 The Accident Aircraft

After take-off, the Aircraft flew 15 minutes in the vicinity of Aso City, then went east from Mt. Nekodake, and then turned north, and flew back and forth for about 20 minutes around Yufu City, then went north, and headed westward at Beppu Bay. And then, the Aircraft flew for about 40 minutes and flew over Ariake Sea, and ditched into the sea. The flight time was about two hours.

It was 13:46:32 when the air traffic control radar first captured the image of the Aircraft which was flying south after taking off from Runway 26 of the Airfield. After that, the radar lost the image of the Aircraft at 13:55:13, but recaptured at 14:06:54, and had been capturing the Aircraft until it was lost at 15:43:15 over Ariake Sea. Details are as following.



Figure 2: Flight route of the aircraft

- |             |  |
|-------------|--|
| About 13:45 | It went southward after taking off from Runway 26 of the Airfield.                             |
| 13:46:32    | Captured by air traffic control radar, went south and turned to east near Mt. Aso.             |
| 13:55:13    | Flew northeast of Mt. Aso, and then turned west, and the radar lost the Aircraft at Aso basin. |
| 14:06:54    | Radar recaptured the Aircraft about 5 km, northeast of the                                     |


	<p>last position. And then, flew near Mt. Nekodake, and flew about 20 km to east, and turned north.</p> <p>14:25:03 Turned northeast near Mt. Kuju.</p> <p>14:55:23 Went about 60 km north flying back and forth, and turned west at around Beppu City in Oita Prefecture.</p> <p>15:37:24 Gradually turned southwest and reached the Ariake Sea. ATC transponder was set to Code 7700 (Emergency).</p> <p>15:43:15 After reaching the Ariake Sea, turned right to north, but soon turned left and flew straight southwest, and the radar lost the Aircraft.</p> <p>The ATC transponder (Air Traffic Control Automatic Transponder) on the Aircraft could not provide altitude information, so ATC radar did not include altitude, however, the Aircraft was also captured by the Self-Defense Forces radar from Beppu City to Ariake Sea, and according to this record, the flight altitude was 4,000 to 5,000 ft.</p> <p>(2) Statement of the Trainee</p> <p>On the day before the accident, after the flight training, the captain, the Trainee and the Person A stopped by at Guest House run by the passenger (about 5 km south of the Airfield) and the captain invited the passenger to the next day flight.</p> <p>On the day of the accident, the flight preparation for the Aircraft was made, the three persons, including the captain, the Trainee and the passenger, got on board, and the Aircraft took off from the Airfield. The captain flew the Aircraft, and after take-off, the Aircraft circled four times at a low altitude over the Guest House. At this time, the captain pointed to the ground, and explained to the passenger that they were flying over the Guest House. Normally, when the Aircraft get in cruise after take-off, the captain would give the control to the Trainee for flight training, however, on the day of the accident, maybe because there was a passenger on board, the captain did not give control and flew the aircraft until it finally made ditching. The passenger maybe was in fear and stayed silent as the Aircraft circled at low altitude. After a while, the captain, the Trainee, and the passenger remained silent.</p> <p>About 30 minutes before the ditching, the captain tweeted “Where is the jagged mountain*1?” And then, the captain was calling somewhere several times on radio. The captain once again repeated “Where is the jagged mountain?” the Trainee felt that the captain might have lost his own position. Looking at the fuel indicator and found it is almost empty, the Trainee asked the captain, “Shouldn’t we go back soon”, the captain responded “I have lost our position.”</p> <p>After flying for a while, the Trainee saw sea ahead. When the Trainee asked the captain “Shall we fly near the shore, if possible?”, but there was no response. After a while, the captain said “Saga Airport is at the foot of the mountain ahead” and flew straight. When the Trainee heard strange engine sound, he thought the Aircraft was running out of gas, the captain asked him to</p>
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\*1 “Jagged Mountain” that Mt. Nekodake in the Aso Mountains is commonly called because of its jagged shape.

	<p>switch the fuel. When the Trainee switched the fuel selector valve, the engine started running fine. After a while, the engine again started to have strange sound, the Trainee switched the fuel selector valve again. After that, the Aircraft flew switching the fuel selector valve every time when the engine sounded strange, after that, even if the valve was switched, the strange engine sound didn't stop any more. The Trainee told the passenger to prepare a lifevest in case of ditching. Captain instructed the Trainee to slightly open the door, the Trainee opened it about 15 cm. Right after that, the engine stopped. The Aircraft was glided about 10 seconds and ditched in the sea. After ditching in the sea, the Trainee saw the engine cover was off, but other than that, there was no significant damage to the Aircraft. As the Aircraft was floating on the water, the Trainee and the passenger got on the left wing, and the captain on the right. The Aircraft floated for about 10 minutes, and then submerged, and the three persons with life jackets were floating in the sea.</p> <p>(3) Statements of the Persons involved</p> <p>Before the take-off, the captain told the Person A that they would fly over the drive-in run by the passenger. (about 5 km east of the Airfield) After the take-off, the Person A was waiting at the drive-in, but the Aircraft did not come. At about 15:45, two hours after the take-off, the Person B, who was waiting at the Airfield, worried about the remaining fuel of the Aircraft, and called the captain on cell phone and he responded. The captain said “The Aircraft ran out of fuel and ditched in the sea near Saga Airport, but everyone is safe and we are now wearing lifevests.”</p> <p>This accident occurred in the Ariake Sea about 10 km west of Miike Port in Omuta City, Fukuoka Prefecture (latitude 33° 00' 56" north, and longitude 130° 18' 33" east) at about 15:45 on April 18, 2022.</p>
<p><b>2.2 Injuries to Persons</b></p>	<p>Captain: Fatal injury  Passenger: Fatal injury</p>
<p><b>2.3 Damage to the Aircraft</b></p>	<p>The Aircraft was found at the bottom of the Ariake Sea about 10 km west of Miike Port (latitude 33° 00' 56" north, and longitude 130° 18' 33" east) on April 20, 2022, and raised out of sea on October 23, 2022.</p> <p>Extent of damage of the Aircraft: Substantially damaged</p> <p>① Nose section</p> <p>Engine cover: Detached  Engines: Detached from the engine mount  Engine detail: No failure leading to the engine stop were confirmed.</p> <p>② Fuselage section</p> <p>Vertical tail: Upper part broken (May be damaged at the bottom or upon raising)</p>



	<p>Rudder: Upper part broken (May be damaged at the bottom or upon raising)</p>  <p>Figure 3: The Aircraft (upside-down position as it was in the sea)</p>																												
<p><b>2.4 Personnel Information</b></p>	<table border="0"> <tr> <td>Captain (Flight Instructor)</td> <td>Age: 80</td> </tr> <tr> <td>Airline transport pilot certificate</td> <td>June 22, 1974</td> </tr> <tr> <td>Flight instructor certificate (airplane):</td> <td>December 17, 1968</td> </tr> <tr> <td>Class 1 aviation medical certificate</td> <td>Validity: March 10, 2023</td> </tr> <tr> <td>Specific Pilot Competence</td> <td></td> </tr> <tr> <td>Expiry of practicable period for flight</td> <td>March 20, 2024</td> </tr> <tr> <td>Total flight time</td> <td>23,940 hours 49 minutes</td> </tr> <tr> <td>Flight time in the last 30 days</td> <td>6 hours 55 minutes</td> </tr> <tr> <td>Total flight time on the type of aircraft</td> <td>5 hours 50 minutes</td> </tr> <tr> <td>Flight time for flight instruction in the last one year</td> <td>5 hours 5 minutes</td> </tr> <tr> <td>Trainee</td> <td>Age: 67</td> </tr> <tr> <td>Student pilot permission</td> <td>Validity: February 20, 2023</td> </tr> <tr> <td>Total flight time</td> <td>5 hours 5 minutes</td> </tr> <tr> <td>Flight time in the last 30 days</td> <td>5 hours 5 minutes</td> </tr> </table>	Captain (Flight Instructor)	Age: 80	Airline transport pilot certificate	June 22, 1974	Flight instructor certificate (airplane):	December 17, 1968	Class 1 aviation medical certificate	Validity: March 10, 2023	Specific Pilot Competence		Expiry of practicable period for flight	March 20, 2024	Total flight time	23,940 hours 49 minutes	Flight time in the last 30 days	6 hours 55 minutes	Total flight time on the type of aircraft	5 hours 50 minutes	Flight time for flight instruction in the last one year	5 hours 5 minutes	Trainee	Age: 67	Student pilot permission	Validity: February 20, 2023	Total flight time	5 hours 5 minutes	Flight time in the last 30 days	5 hours 5 minutes
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<p><b>2.5 Aircraft Information</b></p>	<p>Aircraft type: Fuji-FA-200-160  Serial number: FA-200-288      Date of manufacture: May 4, 1978  Certificate of airworthiness: Dai-2021-524      Validity: December 21, 2022  Total flight time: 3,620 hours 20 minutes (at the time of Airworthiness Inspection)  At the time of accident, the weight and the center of gravity of the Aircraft were each within the allowable range.  Fuel gauge indication and fuel consumption:  According to the statements of the Trainee and Person B, the indication of the fuel gauges at the time of take-off of the Aircraft was 1/4 on both the left and right tanks. According to the Aircraft's Design and Manufacturing Company, at 1/4 indication, the usable fuel quantity is about 6±2 gal (US) on both left and right. The flight manual of the Aircraft states that the Aircraft's fuel consumption upon cruise flight is 7 to 10 gal (US)/h.  As the Airfield is located at a high elevation of 837m, it is recommended that the fuel quantity shall not be loaded more than 1/2 of the tank.</p>																												
<p><b>2.6 Meteorologi</b></p>	<p>The weather observations at the Aso Otohime Regional Meteorological Observatory Station (located 7.3 km south-southwest of the Airfield), were as</p>																												

<p><b>cal Information</b></p>	<p>follows:</p> <table border="1" data-bbox="368 197 1401 286"> <thead> <tr> <th>Time</th> <th>Temp</th> <th>Precipitation</th> <th>Wind direction and speed</th> <th>Sunshine</th> </tr> </thead> <tbody> <tr> <td>14:00</td> <td>18.1°C</td> <td>0.0 mm</td> <td>Southwest 4.8m/s</td> <td>0.5 h</td> </tr> </tbody> </table> <p>METAR at Saga Airport on the day of the accident were as follows: METAR RJFS 180600Z 19005KT 9999 FEW040 SCT120 BKN140 19/09 Q1015</p> <p>According to the statement of the Trainee, on the day of the accident, the wind was calm and it was cloudy, but there was good visibility throughout the flight.</p>	Time	Temp	Precipitation	Wind direction and speed	Sunshine	14:00	18.1°C	0.0 mm	Southwest 4.8m/s	0.5 h
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14:00	18.1°C	0.0 mm	Southwest 4.8m/s	0.5 h							
<p><b>2.7 Additional Information</b></p>	<p>(1) Captain’s experience on the Airfield</p> <p>The captain made a familiarization flight with the person who was used to the Airfield just only once on April 6<sup>th</sup> upon starting flight training with the Trainee. After this flight, the captain started the flight training with the Trainee, and the accident flight was the sixth flight at the Airfield.</p> <p>(2) Trainee’s flight experience</p> <p>The Trainee was one of the co-owners of the Aircraft. When the Trainee purchased the Aircraft, he wanted to get pilot certificate, and the captain was providing flight training to him at the Airfield. The Trainee started his flight training on April 6<sup>th</sup>. The accident flight was his fifth flight. He had no piloting experience before starting flight training.</p> <p>(3) Flight chart and geonavigation</p> <p>Normally, upon local flight within the 9km of the departure, aircraft shall fly by geonavigation which visually references ground landmarks. When flying with geonavigation, aircraft shall fly checking the relative relation between the landmarks and the flight chart.</p> <p>When providing class lecture to the Trainee, the captain instructed the Trainee to purchase 1/1,500,000 scale ENROUTE CHART as a flight chart, and he was explaining using it. Sectional Aeronautical Chart which is generally used in VFR flights with a larger scale of 1/500,000 was not used. The flight training was conducted local within 9 km, however, neither the captain nor the Trainee had their flight charts in the flight.</p> <p>The provisions of Article 59 of the Civil Aeronautics Act and Article 144-2 of the Civil Aeronautics Act Enforcement Regulations specify the documents that the aircraft must carry in flight, includes “Aeronautical charts appropriate for flight sectors, flight method, and other particular aspects of flight operations.”</p> <p>(4) Health condition of the captain</p> <p>The captain held an aviation medical certificate which expires on March 10, 2023.</p> <p>In February 2022, the captain fainted while taking a bath and was rushed to the hospital for an emergency medical examination, but no obvious lesions related to the heart and brain were found.</p> <p>Upon the aviation medical examination in March 2022, the captain did not report about the said fainting.</p> <p>(5) Permits and experience required for pilot training flights, and flight plans</p> <p>The captain held an airline transport pilot certificate and a flight instructor certificate, and an aviation medical certificate, and pilot competency assessment</p>										



so he had the required certification for flight, however, he did not meet the requirements for the recent flight experience (10 or more hours in one year) required to conduct flight training under Article 69 of the Civil Aeronautics Act.

Upon conducting flight training, the Trainee had obtained student pilot permission required by Article 35 of the Civil Aeronautics Act (permission of flight training for those who do not hold a pilot license), but had not obtained a permission to take pilot training flight required by Article 92 of the Civil Aeronautics Act (permission of flight training at the said airspace). In addition, flight plan which is required for flights beyond 9 km of the departure point according to Article 97 of the Civil Aeronautics Act, was not filed.

(6) Radio equipment and navigation instruments of the Aircraft

The Aircraft was equipped with navigation instruments such as the attitude indicator, heading indicator, magnetic compass, and VOR\*<sup>2</sup> indicator. During flight when the accident occurred, there were nearby three airports such as Kumamoto Airport, Oita Airport, and Saga Airport which had the VOR station, respectively.

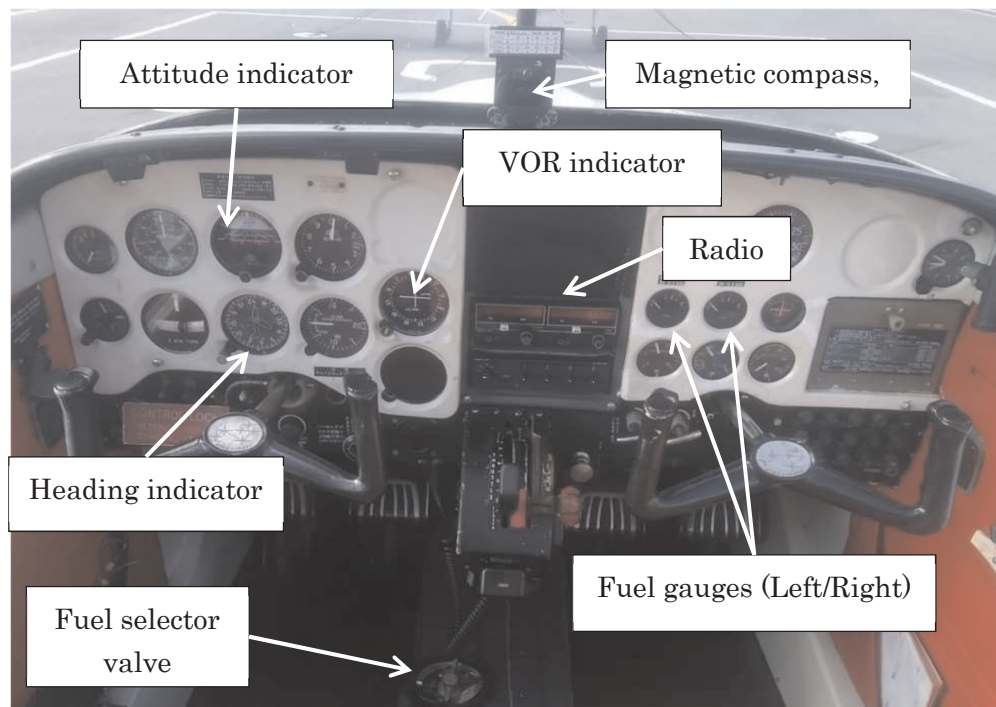


Figure 4: Instrument panel of the accident aircraft

Aircraft radio, which was raised out of sea was investigated, and it was found that the frequencies last set were as following.

Radio	126.2 MHz: Common backup frequency used in control towers at airports in Japan.
Radio STBY* <sup>3</sup>	130.75 MHz: Frequency for Aso flight service
Navigation	112.8 MHz: Frequency for Kumamoto VOR

\*<sup>2</sup> VOR: (VHF Omnidirectional Radio Range) refers to one of navigation systems and a ground beacon station that uses a VHF frequency band. As each VOR station has its own frequency, the aircraft can set its frequency to obtain the relative direction and magnetic bearing information to and from the VOR station.

\*<sup>3</sup> STBY: The frequency of a general aircraft radio is set on the STBY indicator and press the button when setting; STBY will contain the previous frequency or the next frequency to be used.

Navigation STBY 109.3 MHz: Frequency for Kumamoto ILS\*<sup>4</sup>

According to the statement of the Person B, when flying out of the Airfield, communication frequency is set to Aso flight service, and Kumamoto VOR is frequently set for navigation.

126.2 MHz is a common backup frequency used in control towers at airports in Japan. (hereinafter referred to as “Common Backup Frequency”) In this area, this frequency is used at Kumamoto Airport, Oita Airport and Tsuiki Air Base of the Air Self Defense Force, etc., but radio transmission from the Aircraft were not received by the ATC facilities.

130.75MHz is the frequency of ASO flight service used as the Airfield, but radio transmission from the Aircraft was not received on the day of the accident.

112.8 MHz, which was set for navigation , is Kumamoto VOR, however, AIP\*<sup>5</sup> (Aeronautical Information Publication) ENR 4.1-10 describes the information that due to the influence of the terrain, Kumamoto VOR is unusable in the area of the magnetic bearing from 030° to 180° below 8,000 ft.

(7) Emergency reporting means

For the means of communication to ATC, 121.5 MHz is set as an international aircraft emergency frequency when an aircraft is in emergency, and ATC facilities always listening to this frequency. Like in this accident, even when its own position was lost, if the aircraft declares an emergency situation call on this frequency, the ATC facility that receives this call is able to provide assistance such as guiding the aircraft in distress by radar vectoring.

“AIM- J (Effective for 2022 January 1 to June 30)” published on December 20, 2021 by the Japan Aircraft Pilots Association, page 7-10, includes the following description.

*783.Lost Position*

*If your present position has become unsure due to navigational equipment failure or other reasons, assistance by ATC radar or air defense radar may be requested.*

*a. If both transmitter and receiver are operative, attempt to contact with the nearest ATC facility on a published frequency or 121.5 MHz / 243.0 MHz in the following order. <Omitted>*

In addition, ATC transponders have a code of "7700 (Emergency)" to be set in case of emergency. When ATC receives "7700 (Emergency)", they will attempt to establish communication with the aircraft, and if not, they will report the Rescue Co-ordination Center (RCC).

The captain had set the ATC transponder to "7700 (Emergency)" just before the ditching, this code was received by ATC, but the ATC did not receive emergency call on 121.5 MHz.

The captain and the passenger had mobile phones, but there was no evidence that the captain attempted to report using a mobile phone other than answering the call from the Person B after the Aircraft ditching.

\*<sup>4</sup> ILS: Instrument Landing System.

\*<sup>5</sup> AIP : Aeronautical Information Publication issued by the Japanese government, which includes necessary permanent information for the navigation of aircraft.

(8) Medical information

According to the information from the Japan Coast Guard, a judicial autopsy was conducted on the body of the captain and the passenger on April 19, 2022, and the autopsy findings revealed that the captain and the passenger were injured in various parts of their bodies, the direct cause for the fatal injury was drowning.

Regarding the cause of the drowning, it is highly likely that they lost consciousness due to hypothermia, resulted in drowning.

The captain was 80 years old and the passenger was 82 years old, and the temperature of the sea at the time of the accident was 19°C.

(9) Information about search, rescue, evacuation and others related to persons' life and death and injuries

According to the Japan Coast Guard, the progress of the rescue operations of this accident were as following.

1. Around 03:45pm, the Tokyo RCC (Tokyo Rescue Coordination Center) informed to the JCG Operations Command Center, that "30nm south of the SDF Kasuga radar site, the emergency sign of an aircraft disappeared from the radar screen.
2. Around 04:00pm, a friend of the captain called 118 to the 10th Regional Coast Guard Headquarters, saying, "A small aircraft has ditched in the Ariake Sea near Saga Airport, and the captain said that from now, they would wear a life jacket, but the call got cut off there."
3. The 7th Regional Coast Guard Headquarters ordered the patrol vessels and aircraft to be launched.
4. Around 06:00pm, the Patrol Vessel A rescued two people from the sea about 15km south of Saga Airport.
5. Around 06:20 pm, the Patrol Vessel B rescued one person.
6. The two out of three people who were rescued were unconscious.
7. The three people were transported to Saga Airport by helicopter, and the Ambulance took them to the hospital.
8. Three people who were sent to the hospital in Saga Prefecture, the two suffered fatal injuries and the one was conscious.

### 3. ANALYSIS

(1) About the ditching

According to the statement of the Trainee and the result of investigation of the airframe recovered from the sea, there was most likely no failure in the airframe nor engine. The onboard fuel of the Aircraft at the time of take-off was most likely 1/4 on the fuel gauges in both the left and right tanks, according to multiple statements, and the Aircraft more likely had a total of approximately  $12 \pm 4$  gal (US) of fuel on board at the time of take-off. The Aircraft's fuel consumption rate during the cruising flight is about 8 gal (US)/h, and the flight time of the accident flight were about two hours, therefore, the fuel consumption was about 16 gal (US). As the captain said to the Person B on the phone that the Aircraft ditched in the sea due to running out of fuel, and the Trainee stated that the fuel gauges read almost empty, therefore, cause of the ditching of the Aircraft in the Ariake Sea was most likely engine stopped due to lack of fuel. For the quantity of fuel onboard, the captain likely assumed a short local flight over the Airfield. As the elevation of the Airfield is high

and take off and landing weights are limited, aircrafts are normally operated with less fuel may have contributed, but specific reason how the quantity of fuel onboard were determined could not been specified.

(2) Lost position

① History of flight (See Figure 5)

According to the statements of the Trainee and the Persons involved, and radar track records, the Aircraft took off and flew over the Guest House run by the passenger, flew in the vicinity of Aso City, then circled again at a lower altitude over the Guest House, and then, flew nearby Mt. Nekodake, therefore, at this time, the captain more likely had visual contact with Mt. Nekodake and was aware of the position of the Aircraft.

And then, the Aircraft flew 20 km east, and continued flying 20 km north (for about 10 minutes), and at around 14:25, after flying 10 km east from the east side of Mt. Kuju, it flew 10 km back and forth in a north-south direction. At this time, the captain may lost sight of Mt. Nekodake, which was used as a reference for the position of his aircraft, and may lost the position.

The Aircraft then flew northeast, went north along the coastline of Beppu Bay, (see Figure 2) then flew toward west at 14:55. As the captain saw sea in the east, he may assumed that the Airfield might in the west. At this point, the Aircraft altitude was about 4,000 ft, and it was about 50 km away from Mt. Nekodake which he used as a ground reference and he tweeted “Where is the jagged mountain?” and also tried to communicate with somewhere by radio, the captain had most likely lost the position of his aircraft completely in around Beppu Bay.

After that, the Aircraft flew west about 120 km (for about 50 minutes), went out to the Ariake Sea, as the Trainee urged to fly near the land and made a right turn along the coast. The Saga Airport was straight ahead, but the captain possibly misidentified the location of the Airport although the Aircraft was about to head to Saga Airport since when the Aircraft turned left toward the center of the Ariake Sea, and the captain explained to the Trainee “Saga Airport is straight ahead”.



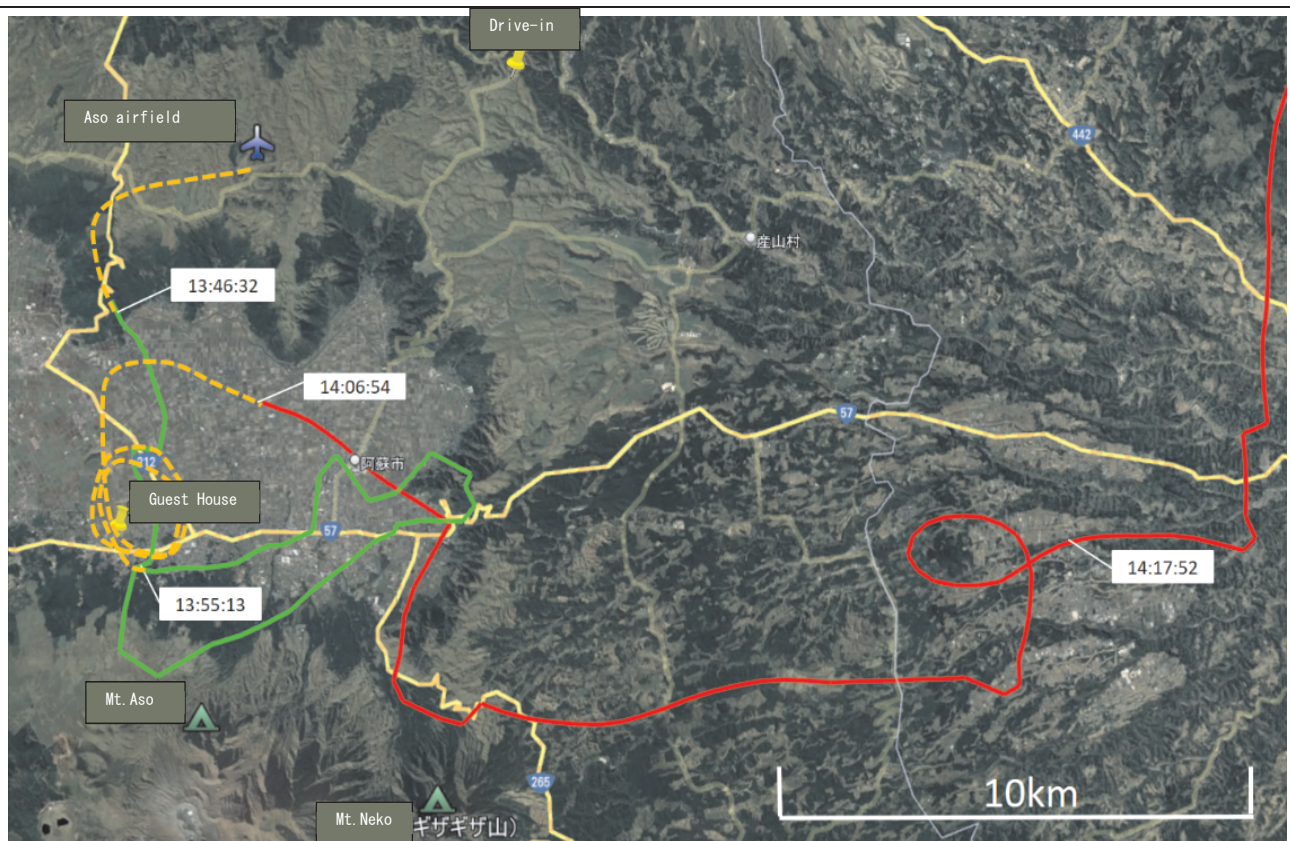


Figure 5: Flight route of the Aircraft

(Solid line: Radar track records, Green: 1st radar detection, Red: 2<sup>nd</sup> radar detection, Dashed line: Estimation)

## ② Captain's flight experience in the Airfield

For the Trainee's flight training, the captain flew local flights within 9 km of the Airfield. Because of this, the captain was mainly using geonavigation to fly by keeping visual contact of the Airfield and other characteristics mountains.

The captain only had one familiarization flight before the flight training for the Trainee, before then, the captain most likely did not have take off or land at the Airfield. As the captain did not make sufficient familiarization flight, it is more likely that the captain did not sufficiently learned the characteristics of the terrain required for geonavigation and the emergency procedures when the aircraft position is lost.

When flying with geonavigation, it is necessary to continuously confirm the position of aircraft visually by ground targets such as "Jagged Mountain" and the Airfield to return. However, it is probable that the Aircraft flew away from the Airfield while the captain missed to keep his eyes on ground targets and he had lost the position of his aircraft.

## ③ Trainee's flight experience

At the time of the accident for the trainee, it was his fifth flight since he started training, and it is more likely that the Trainee did not have knowledge or skills sufficient so as to find the position of their aircraft and give any advice to the captain to return to the Airfield.

## (3) How to respond when losing the position of its aircraft

### ① Use of flight charts and navigation instruments

When flying with geonavigation, normally 1/500,000 Sectional Aeronautical Chart are carried which are generally used for VFR flights, however, the captain and the Trainee did not carry any Chart for this flight. The Aircraft was equipped with radio and a VOR indicator as navigation instruments, if it had the frequencies set of VOR stations of the surrounding airports such as Kumamoto, Oita, and Saga, it could have shown the direction to those airports. From the



frequency which was set on the radio, the information of Kumamoto VOR was possibly displayed on the indicator. However, as Kumamoto VOR is announced unusable from magnetic bearing 030° to 180° below 8,000 ft, at the location around Mt.Kuju where the captain lost its position, Kumamoto VOR was not usable. As the captain and the Trainee did not carry any flight chart, they were unable to check other VOR frequencies, so more likely the situation unable to find their position continued.

② Emergency reporting means

Normally when flying out of the Airfield, the Radio is tuned to Aso flight service. The radio of the aircraft was set to Common Backup Frequency 126.2MHz and STBY was Aso flight service 130.75MHz. Given these facts, after the captain lost position near Beppu Bay, he tried to call the Airfield on radio. As the captain could not establish communication with Aso flight service, it is possible that he switched to 126.2 MHz in order to communicate with other ATC facility. When they reached Ariake Sea, the captain told “Saga Airport is straight ahead”, the captain may switched to 126.2MHz to land at the Airport. However, the calls on 126.2 MHz had not been received by any ATC facilities.

In addition, the Aircraft may could have called on emergency frequency 121.5MHz and vectored to a nearby airport by the ATC facilities. However, there were no calls on this frequency received. Furthermore, emergency situation that the captain lost the position of his aircraft, the captain was able to ask the Trainee or the passenger any support using cell phones, such as communication, map functions, or any kind of gathering information, but it is probable that the captain did not request them.

On the other hand, when the Aircraft reached Ariake Sea, the captain set the ATC transponder to “7700 (Emergency)”, therefore, at this point, the captain most likely thought that there was a high possibility of ditching. The code “7700 (Emergency)” was received by the ATC facilities, but as there were no communication established, it was certainly difficult for the ATC facilities to aid the Aircraft just before ditching to the sea.

As described above, there were various actions the captain may have taken to gain support from the ATC facilities, but it is probable that the captain did not seek for any outside assistance until just before ditching in the sea, he may have obsessed to return to the Airfield by his own, but exact reason why could not be determined.

(4) Flight plan

The captain did not file the flight plan required by Article 97. It is likely that the captain thought the flight plan was unnecessary because, he planned to make only a local flight. But if the flight plan were reported, and the Aircraft did not arrive at the destination at the estimated arrival time, the Rescue Co-ordination Center (RCC) would start the search and rescue operation. In this case, if the flight plan were filed with destination, total estimated elapsed time, and quantity of fuel onboard, search and rescue operations could have started earlier.

(5) Health condition of the captain

The captain held an Aviation Medical Certificate with an expiration date of March 10, 2023.

Two months before the accident, the captain fainted while taking a bath and was rushed to the hospital. The captain did not report to the doctor about this fact in the Aviation Medical Examination, but the medical examination upon the emergency transport did not confirm no obvious lesions in the heart or brain.

From this medical examination, the statements of the trainee about the captain manner during the flight, telecommunication with Person A and the findings of the judicial autopsy conducted after

the accident, there were no factor confirmed in the health condition of the captain which possibly contributed to the accident.

(6) Responses of the crewmembers at the time of ditching in the sea

The Trainee called on the passenger to prepare lifevest just before the ditching in the sea, which enabled them to prepare their lifevests. They had their lifevests at ditching and floated on the sea and after the Aircraft submerged, waited for rescue, but the captain and the passenger lost consciousness possibly due to hypothermia and resulted in drowning.

#### **4. PROBABLE CAUSES**

The JTSB concludes that the probable cause of this accident was that during the flight training, the captain continued flight after he lost the position of the aircraft, the Aircraft run out of the fuel over the Ariake Sea, and ditched in the sea, resulting in drowning of the captain and the passenger.

The captain lost the position of his aircraft possibly because he did not have sufficient terrain feature familiarization and did not carry flight charts. In addition, the reason why the captain continued flying without taking appropriate emergency responses could not be determined.

#### **5. SAFETY ACTIONS**

As described in the Analysis, various factors likely contributed to the occurrence of the accident. However, the similar accidents can be more likely prevented by ensuring compliance with existing rules for safe operation for preparation of flight such as familiarization to terrain, onboard fuel, flight charts, and emergency response procedures, and filing a flight plan.