

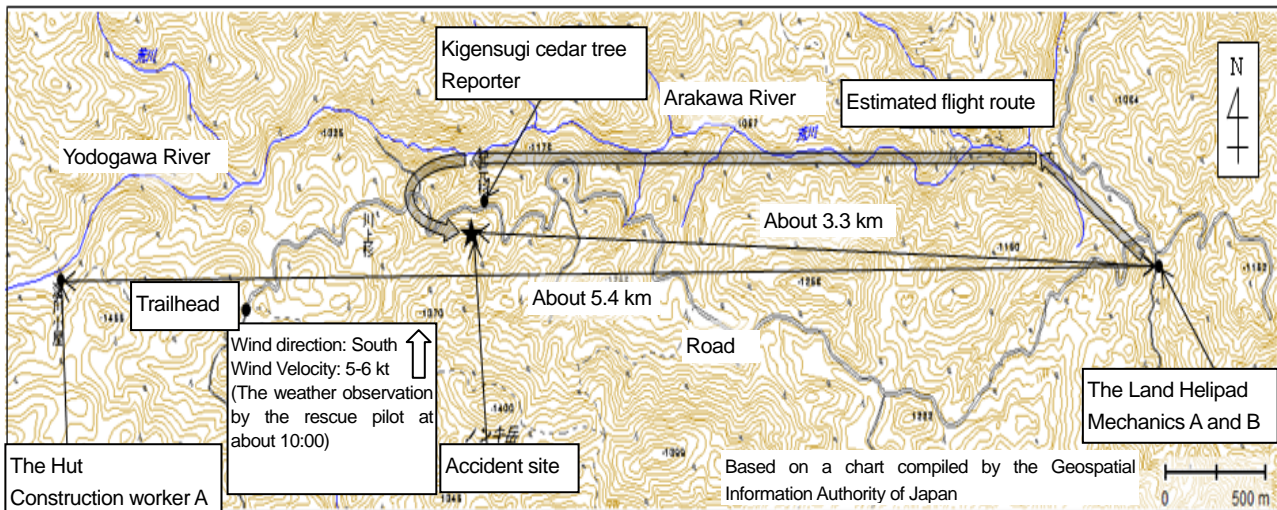
Case 1

Crash during cargo transport with underslung external cargo caught in trees or rocks into the mountain slope

Summary: On Sunday September 26, 2010, an Aerospatiale AS332L operated by Company A, took off for sling load cargo transport from Yakusugi Land temporary helipad (hereinafter referred to Land Helipad) located in Yakushima-Town, Kumage-Gun, Kagoshima Prefecture, and crashed into the mountain slope near Kigensugi cedar tree in Yakushima-Town at about 07:50 local time (UTC+9 hours).

Onboard the helicopter were a pilot and a loadmaster, and both of them suffered fatal injuries. The helicopter was destroyed and consumed by fire.

Estimated Flight Route



Events leading to the Accident

The helicopter took off from Land Helipad for cargo transport, and was flying in the mountain near Kigensugi cedar tree in Yakushima-Town for stone transport.

The helicopter picked up 6th cargo and took off from Land Helipad in the usual manner, but it did not return.

A reporter near Kigensugi cedar tree came to Land Helipad and reported to one of construction workers that the helicopter had crashed.



Type Helicopter

Meteorological Conditions

Mechanics A and B at the Land Helipad received a call from the pilot during the 5th cargo transport saying "The helicopter might land (at Land Helipad) and stand by because of worsening weather condition".

Construction worker A at the cargo unloading site in the vicinity of the Hut heard faint sound of the helicopter coming toward him during the 6th cargo transport and the sound became faint as if the helicopter were turning away on the way.

The elevation of the accident site is about 1,290 m (4,230 ft), and the pilot of the disaster prevention helicopter, the Disaster Prevention Aviation Center, stated "It was overcast with the cloud base 4,500-4,600 ft (1,370-1,400 m) hanging over the ridge in the vicinity of the accident site and the horizontal visibility was good at about 10:00.

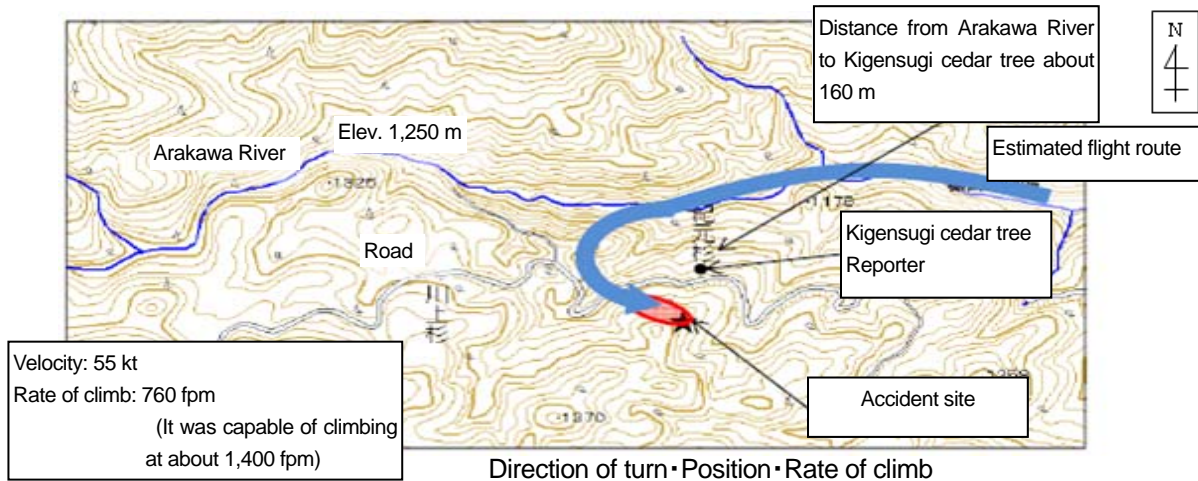
It is probable that the squeezed opening between the lowered cloud base and the surface made it difficult for the helicopter to continue the flight near the cargo unloading sites in the vicinity of the Hut at the time of the accident.

It is probable that the weather conditions over the accident site were such that the cloud base was 100 m above the site-small opening between the ground and the cloud base.

Flight Route at the Time of the Accident

It is probable that the flight route was along the valley of Arakawa and Yodogawa River due to the following reasons:

- ▶ The Reporter stated that he had heard the helicopter flying back and forth when he was near Kigensugi cedar tree, and had seen it flying in the valley to the north of the Kigensugi cedar tree in the direction of the Hut.
- ▶ It is probable that due to the following advantages the pilot chose to fly in the valley rather than over the mountain ridge for the route of helicopter short distance shuttle flights for cargo transport, as he was aware of the absence of linear obstacles (such as wires and cables) and was fully familiar with the geographical features.
 - ▶ A flight at low altitude will shorten the length of the route and provides the helicopter with better margin of usable power (cargo sling capability), which lead to less time and fuel consumption.
 - ▶ Flying over a river provides bigger AGL altitude.

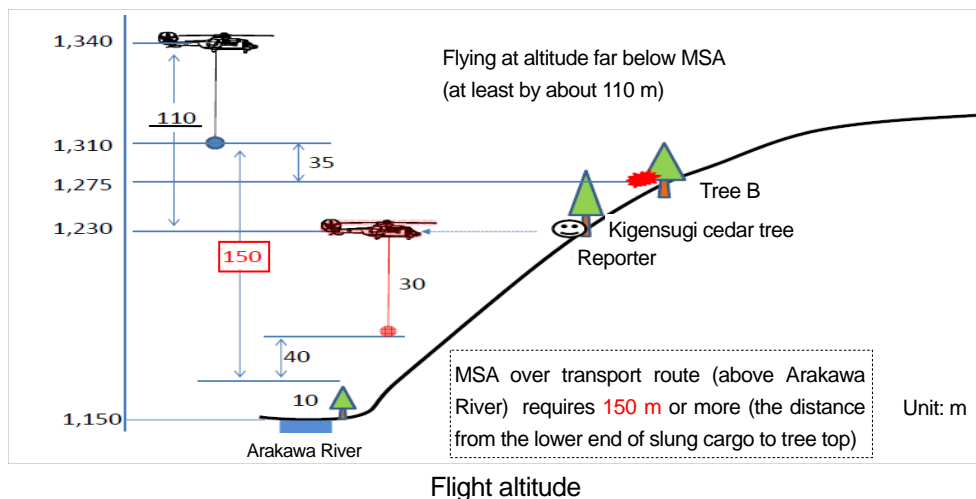


Reasons for Unavoidable Collision with the Trees

It is probable that the pilot selected the easier maneuver of the left turn than OGE hovering (*1) above the Arakawa River, although the latter was possible if he accepted a large control input. His selection resulted in the proximity to the slope in the valley causing the underslung cargo being caught in the branches of Tree B or Rock A. Reason for his selection are as follows:

- ▶ It is highly probable that the helicopter was flying over the route for the cargo transport far below the Minimum Safety Altitude (MSA).
- ▶ The pilot possibly reduced the climb rate to avoid in-cloud situation during the turn, as the opening between the flying altitude and the cloud base was small, although it had enough climbing power to avoid the collision with trees.
- ▶ The pilot possibly failed to judge the cargo clearance from the tree top because it was the left turn—his right seat position hampered his look-out, with the cargo slung with 30 m long slings.

*1: "OGE" hovering stands for out of Ground Effect hovering (hovering at an altitude larger than half the length of a MR diameter where the ground reaction force created by the downwash is unavailable). OGE hovering requires a larger amount of engine power than IGE (In Ground Effect) hovering which is normally carried out below OGE hovering altitude.





Accident Site Taken From Afar During Rescue Operation



Aerial Photo of Accident Site

Probable Cause: In this accident, it is probable that the helicopter, while flying in the mountain valley with underslung external cargo, made a left turn to return back, crashed after nearing the slope with its underslung cargo caught in ground objects such as trees or rocks during maneuver. The post-crash fire consumed the helicopter and the pilot and the loadmaster suffered fatal injuries. The followings are possible reasons why the helicopter came close to the slope during the left turn, and the underslung cargo came to be caught in ground objects such as trees or rocks: capable OGE hovering for turn-back was not carried out; en route altitude was well below MSA; the climbing was restrained during the left turn as the opening under the cloud base was small; and the failure of judging underslung cargo clearance from the trees.

In order to Prevent Recurrence

In view of the result of this accident investigation, the JTSB, pursuant to the provision of paragraph (1) of the Article 27 of the Act for Establishment of the JTSB made the following recommendation to Company A.

Company A needs to review flight operations whether there were non-compliance activities against laws and regulations, to remind all employees engaged in safety-related works including pilots and mechanics of the importance of observing fundamental safety standards such as minimum safe altitude and to review internal contingency communication procedures.

Safety Actions Taken Response to the Recommendations by the Company A

- From the views of compliance against laws and regulations, Company A reviewed safety related events such as non-compliance against laws and regulations on all the works of every unit of Operation/Maintenance of Air Operation Department and as a result of this review took improving measures as necessary.
- To remind the meaning and importance of complying with safety standards such as MSA, Company A decided to hold the safety meeting for all the employees of Air Operation Department, and thoroughly and continually enforce its implementation through Aviation Safety Event, safety education, or CRM.
- Company A checked and reviewed the current contingency communication procedures and took the following countermeasures.
 - (1) As a result of this review, it was confirmed that there existed a few working sites where no on-demand communication was available between heliport and cargo loading/unloading site.
 - (2) As a result of reviewing the communication procedures and evaluating the supplemental communication means, Company A decided to establish the on-demand communication procedures with asking for the cooperation of ordering agent.
When ordering agents are not able to provide necessary communication equipment, Company A loans satellite mobile phones to them.
Company A purchased 6 set of satellite mobile phones and placed a set at each of their branch offices.
 - (3) As a result of reviewing the clarification of communication procedures between heliport and cargo loading/unloading site, Company A decided to take the following measures and notified the concerned personnel of them.
 - Make a separate chart of site communication procedures at the site where no contingency communication procedures is mentioned in a construction plan on work order.
 - Add a check item for emergency communication procedures on meeting sheet of before-work, and confirm it before work by work-crews.
 - Add a description on emergency communication procedures in “Study Guide of Cargo Transport” of Company A.

The investigation report of this case is published on the Board's website (issued on January 25, 2013).

http://www.mlit.go.jp/jtsb/eng-air_report/JA9635.pdf

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