AI2016-2

AIRCRAFT SERIOUS INCIDENT
INVESTIGATION REPORT

NAKANIHON AIR SERVICE CO., LTD.
J A 9 6 6 0

June 30, 2016

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 prevent future accidents and incidents. It is not the purpose of the investigation to apportion blame or liability.

Kazuhiro Nakahashi
Chairman,
Japan Transport Safety Board

Note:

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

AIRCRAFT SERIOUS INCIDENT INVESTIGATION REPORT

NAKANIHON AIR SERVICE CO., LTD. AÈROSPATIALE AS332L (ROTORCRAFT) JA9660 DOROPPING OF OBJECTS DURING EXTERNAL CARGO SLING OPERATION TAKAHAMA TOWN, OI GUN, FUKUI PREFECTURE, JAPAN

BETWEEN 10:35 AND 10:40 JST, OCTOBER 8, 2015

May 20, 2016
Adopted by the Japan Transport Safety Board

Chairman	Kazuhiro Nakahashi
Member	Toru Miyashita
Member	Toshiyuki Ishikawa
Member	Sadao Tamura
Member	Keiji Tanaka
Member	Miwa Nakanishi

1 PROCESS AND PROGRESS OF THE INVESTIGATION

1.1 Summary of the Accident	On Thursday, October 8, 2015, an Aèrospatiale AS332L, registered JA9660, operated by Nakanihon Air Service Co., LTD. transported objects repeatedly among Wakasa Wada Marina temporally helipad and two loading sites in Takahama Town, Oi Gun, Fukui Prefecture. A captain and a flight mechanic were on board and both of them were not injured. The Helicopter was not on fire. And also there was no damages on the ground.
1.2 Outline of the Accident Investigation	This event fell under the category of "Case where suspended object dropped unintentionally" as stipulated Item (xv), Article 166-4 of Ordinance for Enforcement of the Civil Aeronautics Act, which was classified as an aircraft serious incident. The Japan Transport Safety Board designated an investigator-in-charge and an investigator on October 8, 2015, to investigate this serious incident. An accredited representative and an adviser of France Republic, as the State of Design and Manufacture of the rotorcraft involved in the serious incident, participated in this investigation. Comments were invited from parties relevant to the cause of the serious incident. Comments were invited from the relevant State.

2 FACTUAL INFORMATION

2.1 History of the Flight

The history of the flight is summarized as below based on the statements of the captain, the flight mechanic, the ground worker and the witness.

On Thursday, October 8, 2015, an Aerospatiale AS332L, registered JA9660, operated by Nakanihon Air Service Co., LTD. transported objects repeatedly among Wakasa Wada Marina temporally helipad and two loading sites in Takahama Town, Oi Gun, Fukui Prefecture.

At Between 10:35 and 10:40 JST (Japan Standard Time: UTC+9 hrs.) when the rotorcraft slung loads including wooden frames packed with Mokko*1 and transported it from No.11 loading site to the temporally helipad, a pair of wooden frames came out of the Mokko and dropped on the ground.

Photo 1
Slinging work by the rotorcraft
(Illustrative purpose)

In the rotorcraft, the captain took the right pilot seat and the flight mechanic for monitoring the outside and guidance, took the seat in the left side of the cabin.

At the time when this serious incident occurrence, the captain made a level flight at an airspeed of about 80 kt and an altitude of about 1,500 ft which secure the stability of slinging loads because the north wind with some gusts was a little strong but neither affects the flight nor shakes the Rotorcraft. When the captain unloaded materials for construction on the temporally helipad in the eighth loads transportation on the day, he was informed from the ground worker that "some loads seemed to drop" by radio, then made a landing to confirm loads, and found that there was a gap of the Mokko for slung loads transported for the sixth time and the loss of a pair of wooden frames. The captain and the flight mechanic did not notice the dropping of the pair of wooden frames during the flight.

The witness saw the pair of wooden frames come out of the Mokko and dropped on the ground from the viewpoint near the dropping point, and said as the scene that it came out of the Mokko in the sky above the point about 1.4 km east of the temporally helipad in the opposite direction to the flight direction, and dropped on the ground fluttering in the wind.

*1 : "Mokko" means a tool for wrapping and hanging loads, which is made of woven ropes like a net and whose four corners have a string for hanging.

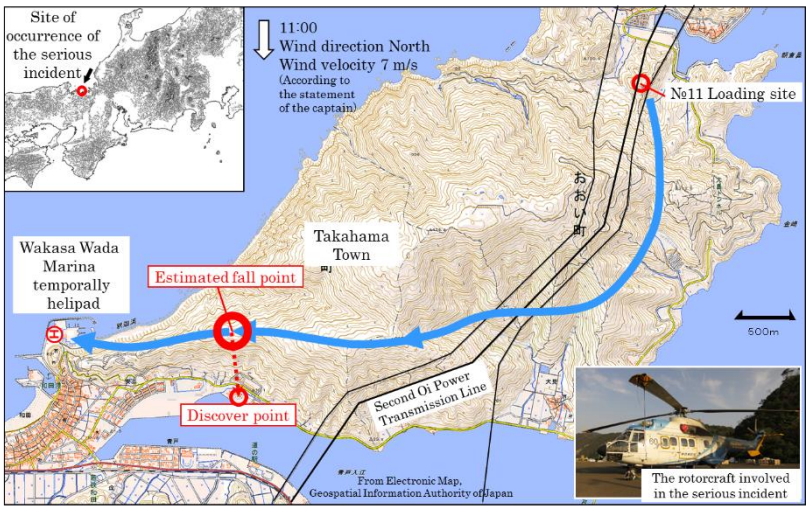


Fig. 1 Estimated flight route

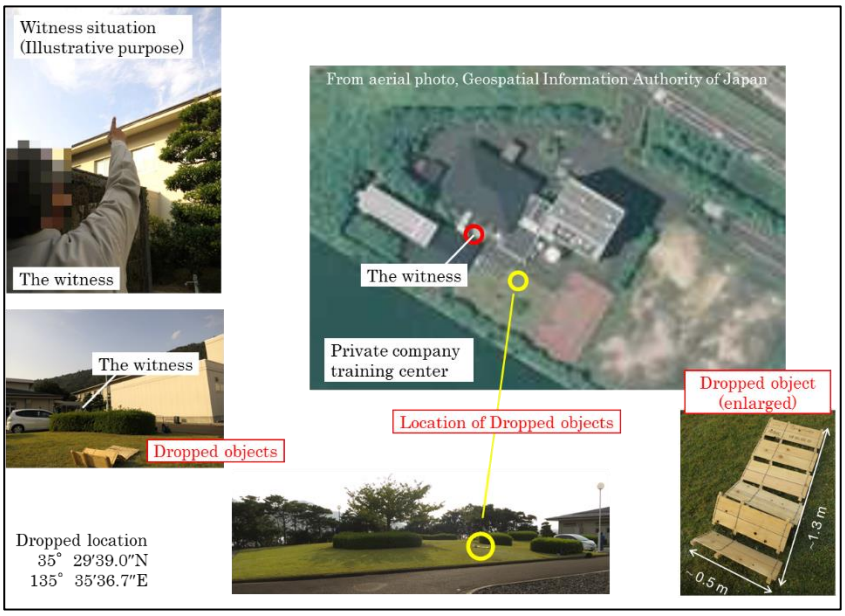
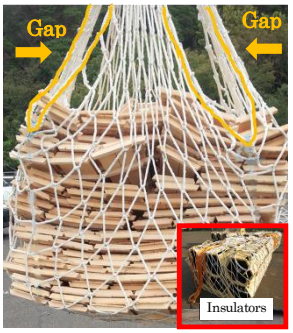


Fig. 2 Dropped site

The serious incident occurred at the time between 10:35 and 10:40, at the point with an altitude of about 1,500 ft, about 1.4 km east of the temporally helipad (35°29'55″N, 135°35'35″E).

2.2 Injuries to Persons	None
2.3 Damage	Extent of damage of the rotorcraft: None
2.4 Personnel Information	Captain Male, Age 43 Commercial pilot certificate (Rotorcraft) June 24, 1998 Type rating for Aèrospatiale SA330 June 5, 2012 Class 1 aviation medical certificate Validity: February 28, 2016 Total flight time 5,800 hrs. 24 min Total flight time on the type of aircraft 867 hrs. 57 min

2.5 Aircraft Information	Aircraft type: Aerospatiale AS332L Serial number: 2095, Date of manufacture: March 6, 1984 Certificate of airworthiness: No. Dai-2014-708 Validity: April 3, 2016 Total flight time 12,397 hrs 18 min
2.6 Meteorological Information	According to the statements of the captain, the weather during loads transportation was high cloud with fine visivility and north wind of about 7 m/s.
2.7 Additional Information	(1) Wooden frames for packing insulators The dropped wooden frames are parts for wrapping and packing insulators ,installed on a power transmission line, to protect the transported insulators from damage, and are made of six wood boards connected by wires (the length is about 1.3 m, the width is about 0.5 m, and the weight is about 2.6 kg). The wooden frames packed in the loading site were transported to the temporally helipad in two flights which are the fourth time (25 pairs) and the sixth time (73 pairs). (2) Packing condition of wooden frames The ground worker packed the loads in conjunction with other materials in the loading site on the previous day (7th), piled wooden frames folded into two, which were wrapped by Mokko. The worker who was the person in charge of packing performed final confirmation after the completion of packing tasks, the worker found the gap in Mokko, therefore instructed other ground workers to bind up and close the gap with ropes and conducted the task also by oneself. The person in charge of packing confirmed that the gap was blocked by receiving completion reports from other ground workers.  Fig. 3 Situation of packing (Replicate) In the work of slinging loads from the rotorcraft on the day, a wire rope made by connecting two wire ropes with each other passed through the packed Mokko, and the tip of the rope was connected by a slinging worker to a sling hook installed on the tip of about 15-meter rope extended from the fuselage. (See Photo 1) According to the person in charge of packing, the tight binding of Mokko made, it difficult to find gaps, as the end parts of Mokko were overlapped and there seemed no gaps in the Mokko. (3) Dropped site of wooden frames The wooden frames dropped in a grass area in a training center of private company located in the south side of the flight route. This did not cause any damages to people and objects on the ground.

	(4) Flight route of loads transportation Operators who perform loads transportation by the slinging sets the flight route which does not affect the safety of people and objects on the ground for the transportation. In this regard, and the rotorcraft also operated while paying attention to the configuration of transportation loads and the weather of that day, based on the flight route which was set in advance by the company taking into account the effects on the safety of ground.

3 ANALYSIS

3.1 Involvement of Weather	None
3.2 Involvement of Pilots	None
3.3 Involvement of Equipment	None
3.4 Involvement of Others	It is probable that the effects of air current accompanied with flight was contributed to the drop of wooden frames.
3.5 Analysis of Findings	(1) Preparation of loads transport (Packing) It is probable that appropriate actions was not taken for the gap of Mokko for slinging loads. Because it was difficult to notice the gap due to overlapped parts of Mokko in packing, preventing the confirmation of existence of the gap, the task for blocking the gap was not enough, and the final confirmation for packing by the person in charge of packing was performed partly by reports from ground workers; (2) History of drop of wooden frames The fallen wooden frames became a shape which tended to contain air by being folded into two in packing, which was more vulnerable to effects of air current accompanied with flight. Therefore, it is highly probable that a pair of wooden frames in the top of slinging loads came out from the gap of Mokko due to the effects of air current and dropped on the ground. (See Fig 3) (3) Flight route and dropped site Regarding no damages against people and objects on the ground by this dropping loads, it is probable that because the flight route which does not affect the safety of people and objects on the ground is set and the captain also flied while paying attention to the configuration of transportation loads and the weather. However, the loads, which were relatively light-weight with large surface area, were drifted to the south side from the flight route due to the north wind which blew when the loads were dropping, and dropped onto the grass area inside the training center of private company instead of the ground directly below the route; therefore, it is probable that it might cause damages depending on wind conditions. It is important to not only ensure the measures for preventing the drop

	in packing but also perform risk assessment considering effects and the range on the ground if the loads were to drop unintentionally, in setting flight routes.

4 PROBABLE CAUSES

In this serious incident, it is highly probable that the wooden frames were transported under the conditions where the Mokko had the gap, causing the pair of wooden frames to come through the gap due to effects of air current accompanied with the flight and dropped on the ground.

Regarding the transportation under the conditions the Mokko had the gap, it is probable that it was because the confirmation of the gap in packing and the task for closing the gap were not enough, and the final confirmation for packing by the person in charge of packing was performed partly by reports from ground workers.

5 SAFETY ACTION

5.1 Safety Actions Taken by the Company	The company established the following recurrence preventive measures in response to this serious incident. (1) Drop prevention measures are always taken for slinging loads for which the Mokko is used, such as a cover Mokko, a cover net, or binding the gap of Mokko according to the shape of loads. (2) The color of ropes for binging the gap of the Mokko are changed different from Mokko and is attached to Mokko when it is distributed to the field. (3) The cover Mokko, the cover net, or the binding conditions of Mokko gap are confirmed visually and "by using hands". (4) The configuration and the contents of confirmation of secure the binding of loads is ensured visually and by using hands are added to a safety educational material, and (1) - (3) are made known to participants of education including ground workers and a person in charge of packing as notes for packing procedures.
5.2 Others	In the notification of Director of Flight Standards Division, Aviation Safety and Security Department, Civil Aviation Bureau, titled " Detailed Regulation of Evaluation for Operation Manual" (Partial revision (Notification No.4 of Flight Standards Division, Engineering Department, Civil Aviation Bureau, Ministry of Land, Infrastructure, Transport and Tourism) as of May 8, 2015), the following matters concerning the operations involved in loading and unloading are required to be included in the flight rules and so on. *(1) The scope and contents of tasks of a person engaged in operations involved in loading and unloading shall be determined.* *(2) (Omitted)* *(3) The following items involved in loading, fixing, and unloading of loads shall be required to be performed.* *a. Inspection of appearances (deformation or damage) of loads and the loading site before loading* *b. Surely fixing loads by nets, and other means.*

	c. Confirmation of appearances (deformation or damage) of loads, and the damage, leak, or the residual in the loading site after unloading *(4) It shall be prescribed that the supervisor for loading and unloading confirm that the freight and baggage have been appropriately loaded. In addition, it shall be prescribed that the captain and, if necessary, relevant departments be informed of the completion of loading and fixing freight and baggage (except for the case where the captain confirm it by oneself)* *Additional Clause (May 8, 2015)* *1. This detailed regulation becomes applicable from June 30, 2015.* *2. When this detailed regulation is applicable, the operation manuals or their annexes that have flight rules obtained approvals or that have been failed for approvals, (omitted) the provisions of the previous rules are applicable within nine months of the applicable date of this detailed regulation.* The company reviewed relevant rules for this notification, and revised operation manual.