AI2019-4

AIRCRAFT SERIOUS INCIDENT
INVESTIGATION REPORT

NAKANIHON AIR SERVICE CO., LTD.
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May 30, 2019

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.

Nobuo Takeda
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.

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April 19, 2019
Adopted by the Japan Transport Safety Board

Chairman	Nobuo Takeda
Member	Toru Miyashita
Member	Yoshiko Kakishima
Member	Yuichi Marui
Member	Yoshikazu Miyazawa
Member	Miwa Nakanishi

Company Name	Nakanihon Air Service Co., LTD.
Type, Registration Mark	Aèrospatiale AS332L (Rotorcraft) JA9660
Incident Class	Dropping of Object during External Cargo Sling Operation Item 15, Article 166-4 of the Ordinance for Enforcement of Civil Aeronautics Act of Japan
Date and Time of the Occurrence	At about 12:12 (JST: UTC + 9hrs, unless otherwise stated all times are indicated in JST on a 24-hour clock), August 21, 2018
Site of the Incident	Fukushima-town, Matsumae-gun, Hokkaido Prefecture (41°26'39" N, 140°13'03" E)

1. PROCESS AND PROGRESS OF THE INVESTIGATION

Summary of the Serious Incident	On Tuesday, August 21, 2018, the aircraft dropped the blue sheet and the cable from the cargo net that was slung external to the aircraft, while flying over a mountain forest in Fukushima-town, Matsumae-gun, Hokkaido Prefecture.
Outline of the Serious Incident Investigation	The Japan Transport Safety Board (JTSB) designated an investigator-in-charge and an investigator on August 21, 2018 to investigate this serious incident. An accredited representative and an adviser of the French Republic, as the State of Design and Manufacture of the aircraft involved in the serious incident, participated in this investigation. Comments were invited from parties relevant to the cause of the serious incident and the Relevant State.

2. FACTUAL INFORMATION

Aircraft Information

Aircraft type: Aèrospatiale AS332L
Serial number: 2095; Date of manufacture: March 6, 1984
Certificate of airworthiness: No. DAI-2017-716; Validity: February 27, 2019

Personnel Information

Captain: Male, Age 51
Commercial pilot certificate (Rotorcraft) July 11, 1989
Pilot competence certificate

	Expiration date of piloting capable period: April 24, 2020
Type rating for single-turbine engine (land)	April 15, 2008
Class 1 aviation medical certificate	Validity: July 9, 2019
Total flight time	14,449 hours 53 minutes
Flight time on the same type of aircraft	3,194 hours 12 minutes

Meteorological Information

According to the weather that the captain confirmed, when the aircraft took off from the temporary helipad (hereinafter referred to as "the Helipad") in Fukushima-town, Matsumae-gun, Hokkaido Prefecture, it was cloudy with a southeast wind at 5 kt or less (judging from the windsock set up at the Helipad).

Details of the Incident and Related Information

(1) History of the Flight (See Figure 1: Estimated Flight Route.)

In order to transport materials for tower construction, the aircraft lifted three cargos at the cargo loading site of the Helipad, and commenced to fly toward the cargo unloading site located about 1.5 km northwest of the Helipad.

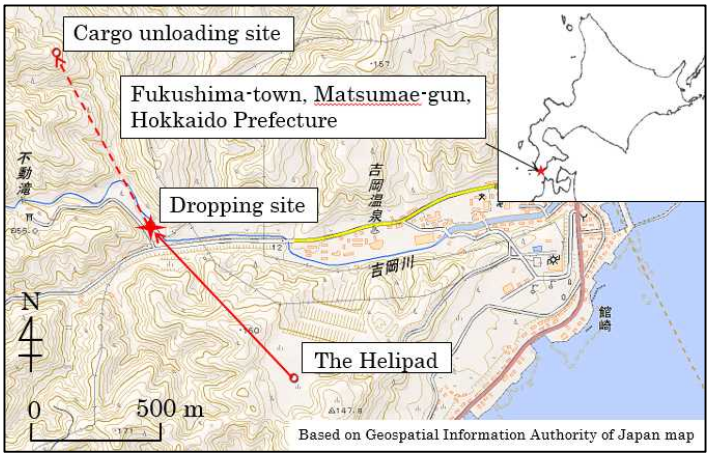

Figure 1: Estimated Flight Route

When the aircraft crossed over a tower and started descending at a speed less than 50 kt, the on-board mechanic noticed that the blue sheet wrapping the cable was protruding from a gap near the knot of cargo net and fluttering in the wind. As the cable was being gradually exposed from the blue sheet, the captain reduced the speed to about 40 kt or less so as not to drop the cargo. When the aircraft slowed to its speed close to hovering, the blue sheet and the cable dropped in the mountain forest from about 130 m above the ground.

The captain and the on-board mechanic did not operate the external cargo sling system and there were no abnormalities found in the airframe and its system. When the blue sheet and the cable dropped, the knot of cargo net wrapping the blue sheet was loosened to create a gap.

(2) Planned Packing Style (See Figure 2: Planned Packing Style.)

In the preparation made on the previous day, the blue sheet and the cable were wrapped in a 4 meter square cargo net by tying to each other its diagonal handles at the four corners. In addition, in order to avoid interference between the three cargos (for cable, stepladder and tools) to be slung, one wire (d) was additionally attached to the tools' cargo to adjust the

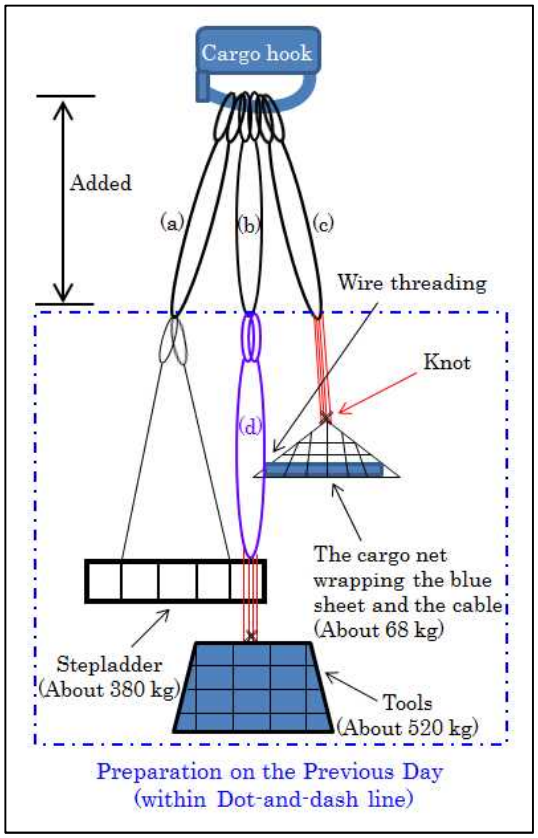

Figure 2: Planned Packing Style

height of the cargos.

On the day of the incident, the captain instructed the three ground workers to attach the additional wires (a, b and c) for the cargos in order to ensure the safe clearance between the aircraft hovering over the unloading site and the trees at the site, and to thread the wire (d) through the side of the cargo net wrapping the cable (hereinafter referred to as "the Wire Threading") in order to prevent the lightweight cable from being shaken by wind pressure during flight.

After adding the wire (c) and finishing the Wire Threading, one of the ground workers recalled another work to do, therefore, he left the site in the middle of a series of work. And after finishing the work he recalled, the ground worker returned and added two wires (a, b). Herewith, the sling wires for the three cargos were extended and only the tools' cargo was to be slung by the two wires (b, d).

(3) Loading Operations (See Figure 3: Actual Packing Style.)

The three ground workers hooked the three cargos one by one on each hook. But when hooking the wire for the tools' cargo, the ground worker who had added one wire (b), presumed that he might have attached one extra wire, therefore, he removed the added wire (b) and hooked the wire (d) on the cargo hook.

When the three cargos were lifted up by the aircraft, the Wire Threading part was also pulled up, and the cargo net wrapping the cable was tilted by about 45 degrees.

When confirming the packing style after the cargos were lifted up, the captain did not notice that the cargo net wrapping the cable was being tilted, despite his looking at the cargos by a rearview mirror at the bottom of the cockpit. The three ground workers and the on-board mechanic noticed that the cargo net wrapping the cable was being tilted, but having judged "there would be no problem with this kind of inclination", they informed the captain a signal of "OK", thus the aircraft commenced to transport the cargos.

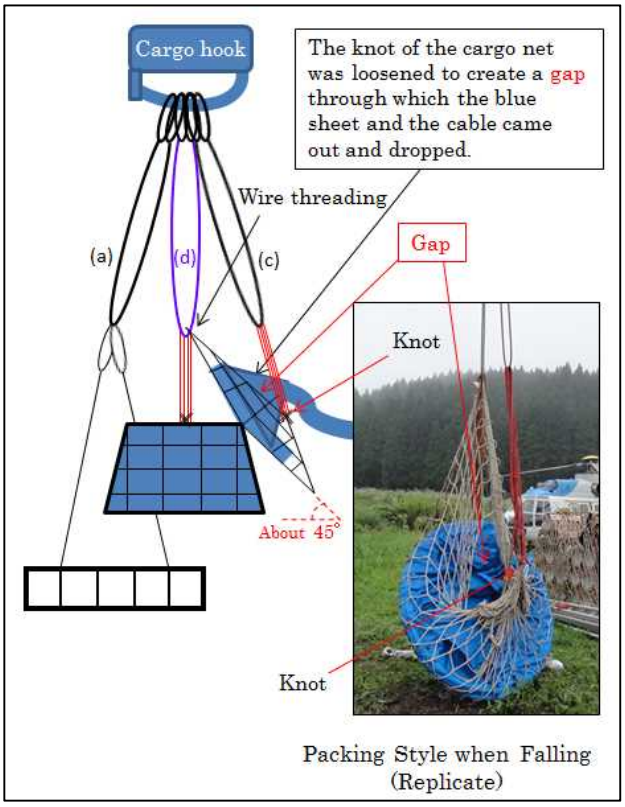

Figure 3: Actual Packing Style

3. ANALYSIS

It is probable that the ground worker, who added the wires (a, b and c), removed the wire (b) that he had added, because the memory of the planned packing style became unclear due to the interruption of his work, which misled him to thinking that he might have attached one extra wire for the tools' cargo. Therefore, it is somewhat likely that because the wire length of the tools' cargo became short, the Wire Threading part of the cargo net was pulled up, and therefore, the knot of cargo net was loosened to create a gap.

It is highly probable that even though the ground workers and the on-board mechanic noticed that the cargo net wrapping the cable was being tilted, they informed the captain a signal of "OK", thus the aircraft commenced to transport the cargos; during the flight, the blue sheet

wrapping the cable protruded from the gap that was generated as the cargo net's knot was loosened; the cable was exposed from the blue sheet, and at the same time the gap got to be larger, as the blue sheet was fluttering in the wind; and as a result, the blue sheet and the cable come out through the gap and dropped on the ground.

It is necessary to check the packing style at the beginning of the transportation, but immediately terminate the transportation when finding the packing style improper such as being tilted with slung cargo, and unload the cargo to check the packing condition, because it is possible that the cargo may drop or collapse due to wind pressure during flight if an aircraft transports the cargo in an improper packing style. In addition, it is also effective to tighten the gap leading the knot of cargo net in order to prevent the cargo from collapsing or dropping.

4. PROBABLE CAUSES

In this serious incident, it is highly probable that because the knot of one of the cargos net was loosened to create a gap during the multiple external cargos sling flight, the blue sheet and the cable came out through the gap and dropped on the ground.

Regarding why the knot of cargo net was loosened to create a gap, the wire was threaded through the other cargo net wrapping the cable; moreover, it is somewhat likely that because the aircraft flew with the cargo net tilted as the part of the Wire Threading was pulled up, since the total length of the sling wire for the tools' cargo was short rather than the planned length.

5. SAFETY ACTION

The Company took the following measures to prevent the recurrence of the similar incidents, revised the guidelines and education materials for cargo transport, and provide reeducation for all personnel involved in cargo transport after the serious incident.

(1) When multiple cargos are slung at the same time, if there is something wrong in the packing style in the suspended state, including the case where the slung cargo is significantly tilted, the cargo shall be unloaded on the ground to reconfirm the packing condition.

(2) When a cargo is wrapped in cargo net, another cargo net shall be used to cover the wrapped cargo, or the gap leading the knot of cargo net shall be tightened. Unless those measures are taken, the cargo shall not be transported.