

## Serious incident between the ROBINSON - R44 registered F-OIAS

### and a DJI Matrice 300 RTK drone

on 15 December 2020

at the Goro mine (New Caledonia)

<sup>(1)</sup> Except where otherwise indicated, the times in this report are in local time.

<b>Time</b>	Around 14:50 <sup>(1)</sup>
<b>Operators</b>	Helicopter: Helisud Drone: Civil Defence
<b>Type of flight</b>	Aerial photography
<b>Persons on board</b>	Pilot and two passengers
<b>Consequences and damage</b>	None

This is a courtesy translation by the BEA of the Final Report on the Safety Investigation published in December 2021. As accurate as the translation may be, the original text in French is the work of reference.

## Near-collision between a helicopter and a drone during an aerial photography operation

### 1 - HISTORY OF THE FLIGHT

*Note: the following information is principally based on statements, radio-communication recordings, and data from the drone.*

<sup>(2)</sup> In the previous months, Vale, the company operating the Goro mine, had announced its sale to a foreign company.

Following this announcement, large protests had taken place against the sale of the plant. The latter had been the scene of violent clashes and had resulted in a lot of damage to equipment.

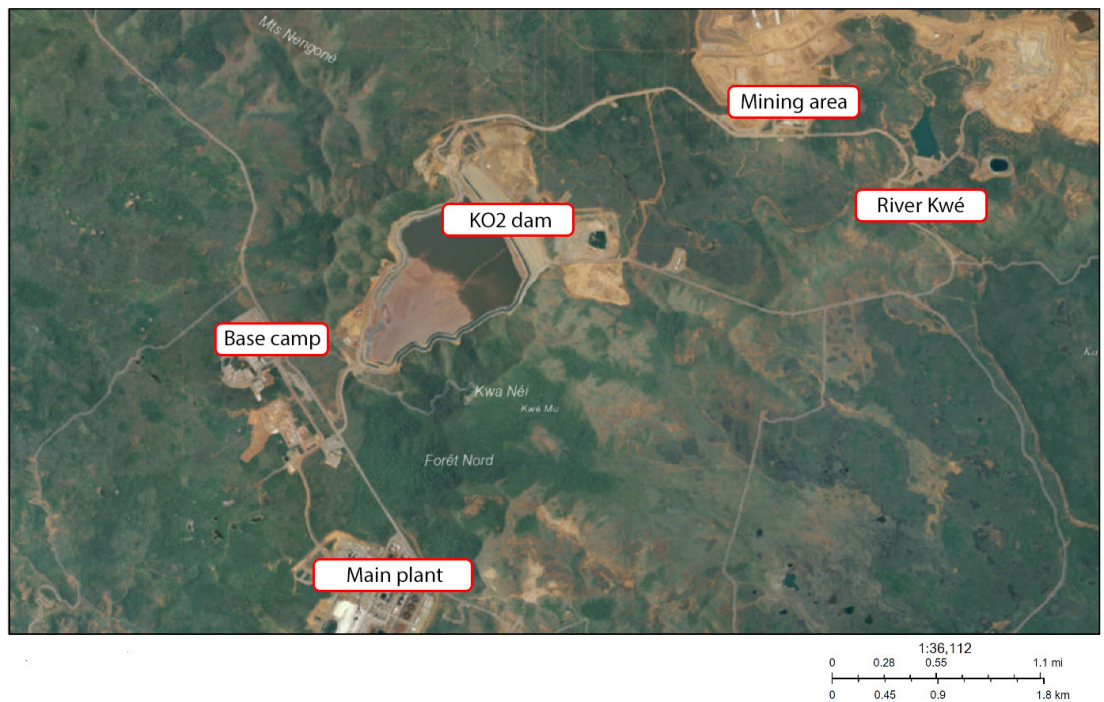
<sup>(3)</sup> Part of the plant including a rest and recreation area.

In the morning, the New Caledonia television channel "la 1<sup>ère</sup>" asked the company, Helisud to carry out a photography and video flight over the Goro mine<sup>(2)</sup>. On the same day, the local authorities asked the Civil Defence to take pictures over the mining area with a drone in order to determine the source of a contamination and its impact on the River Kwé.

The Civil Defence team started taking photographs from 13:30. At 13:45, the pilot of the helicopter took off from Nouméa Magenta airport with a journalist and a cameraman on board. He flew over the south of the plant before heading up the River Kwé at a height of between 150 and 300 ft.

At 14:49, while the drone was at a height of about 430 ft, on the return leg to the landing point, the Civil Defence team detected the presence of a helicopter in the drone's working area at a height of less than 500 ft. The remote pilot specified that from his position, he had seen the helicopter pass below the drone. The pilot of the helicopter indicated that he had seen an object slightly higher and to the left of his flight path.

After the aircraft had crossed paths, the remote pilot immediately landed the drone and the helicopter pilot continued his photography operation. He then landed at the base camp<sup>(3)</sup> of the Vale plant (see [Figure 1](#)).



Source: Vale company

Figure 1: Map of the plant

## 2 - ADDITIONAL INFORMATION

### 2.1 Meteorological information

The meteorological conditions estimated by the French met office, Météo-France, at the time of the accident were as follows:

- average surface wind from east, 15 kt gusting up to between 20 kt and 25 kt;
- visibility above 10 km;
- cloudy sky with a ceiling generally between 3,500 ft et 4,000 ft, no precipitation.

### 2.2 Pilot information

#### 2.2.1 Experience

The 42-year-old pilot held a Commercial Pilot Licence - Helicopters (CPL(H)). He held type ratings for AS350, EC130, Bell 206 and R44 helicopters. He had logged approximately 2,500 flight hours on helicopters, 2,300 hours of which in a R44 and 120 hours of which in a R44 in the last three months. He also held the Declaration of proficiency guaranteeing that he had been trained to perform aerial photography, video and observation work at low height.

### 2.2.2 Statement

The pilot indicated that on arriving at the site of the mining area, he made three or four circles in order to take aerial photographs of it. He then saw an object slightly higher and to the left of his path. He said that he carried out an evasive manoeuvre consisting of a slight right turn and did not act abruptly on the controls as he was at a low height. Moreover, he did not want to interfere with the photography operation in progress. The pilot specified that he remained at a height lower than that of the object while their paths crossed. He continued his flight and landed at the base camp once the pictures had been taken. He then received a call from Helisud informing him that he had just crossed paths with a Civil Defence drone. Helisud had been informed of this by the air navigation services that had themselves been alerted by the Civil Defence team on site.

He specified that the clearance to enter and fly in the NW R4 area had been received by telephone at the Helisud headquarters. This clearance had been given by the plant's safety department, in coordination with management. They had been told that the clearance included flying over the nickel mine and the plant's base camp and then landing at the camp.

The pilot emphasised that the Vale plant had not informed them of any drone activity at the site and that no NOTAM mentioned this activity. Furthermore, he had reported the NW R4 area as his destination to the Nouméa Magenta controller and had not received any particular information about the presence of a drone.

The pilot said he had been surprised that the remote pilot of the drone had not heard the helicopter arrive, given the location of the site in a low-lying area and the fact that the helicopter was moving forward at a speed of between 40 and 60 kt.

### 2.3 Passengers' statement

The purpose of this flight was to take pictures of a potential contamination of the River Kwé near the Goro mining site, then to land at the plant's base camp for an on-site interview with the plant's managers. To this end, the New Caledonia television channel "la 1<sup>ère</sup>" had requested clearance from the Vale plant to fly over the NW R4 area. This had initially been refused in the morning before being granted at the beginning of the afternoon. The clearance had been granted verbally by telephone to Helisud, then by e-mail to the NC channel "la 1<sup>ère</sup>".

Take-off had taken place within minutes of clearance being received. The pilot had flown up the river and over the base camp before landing there. The passengers said they had not seen any drone or felt any sudden manoeuvre. They specified that after landing, Civil Defence staff members had come to talk to the pilot near the helicopter.

## 2.4 Civil Defence remote pilot's statement

The remote pilot specified that the mission performed at the request of the High Commission of the Republic in New Caledonia, was a reconnaissance flight on behalf of the mining operator, Vale. On the day of the incident, the latter had asked for an operation in the NW R4 area in order to detect a potential contamination of the River Kwé. The Civil Defence had specified to Vale that the drone's take-off zone would be located in the plant's mining area. The planned flight height was not to exceed 150 m (about 500 ft). To carry out this reconnaissance flight, the Civil Defence operated the drone in the "out of sight" of remote pilot configuration.

The Civil Defence team consisted of a remote pilot and a "spotter" positioned a few metres from the remote pilot and slightly above him. The spotter's role was to detect the potential presence of other aircraft and to report any presence to the remote pilot. The team had arrived at the site at 9:40 and had contacted the control tower of La Tontouta airport to inform the air navigation services of their presence. Hélicocéan and the Gendarmerie Air Section (SAG) were also notified by phone. During the events of the previous week, the Civil Defence team had intervened and worked jointly with these two operators on two occasions at the Vale plant site. The team had thus been able to identify that these operators had missions planned at the site on the day of the incident.

In the morning on the day of the incident, Hélicocéan and the SAG intervened at the plant site and the Civil Defence operated its drone. These three operators had set up a radio frequency dedicated to the communication between the helicopter pilots and the Civil Defence team, which ensured a successful coordination between the flights of the helicopters and the drone.

In the afternoon, when the Civil Defence spotter detected the presence of a helicopter in the drone's working area, he immediately reported it to the remote pilot. The latter specified that from his position, he saw the helicopter pass below the drone without performing any evasive manoeuvre, which led him to believe that the helicopter pilot had not seen the drone.

The remote pilot ordered a vertical descent of the drone immediately after the aircraft had crossed paths in order to land it as quickly as possible, in accordance with the manual of particular activities of the Civil Defence<sup>(4)</sup>. The team then contacted the La Tontouta airport control tower.

<sup>(4)</sup> Paragraph 5.1.4:

In the event of a third party or other aircraft entering the safety perimeter, the aircraft will return to the ground as soon as possible, while ensuring the safety of the third party upon landing.

## 2.5 Read-out of recorded data

The data recorded by the DJI Pilot app was used to reconstruct the path of the Civil Defence drone (see Figure 2).

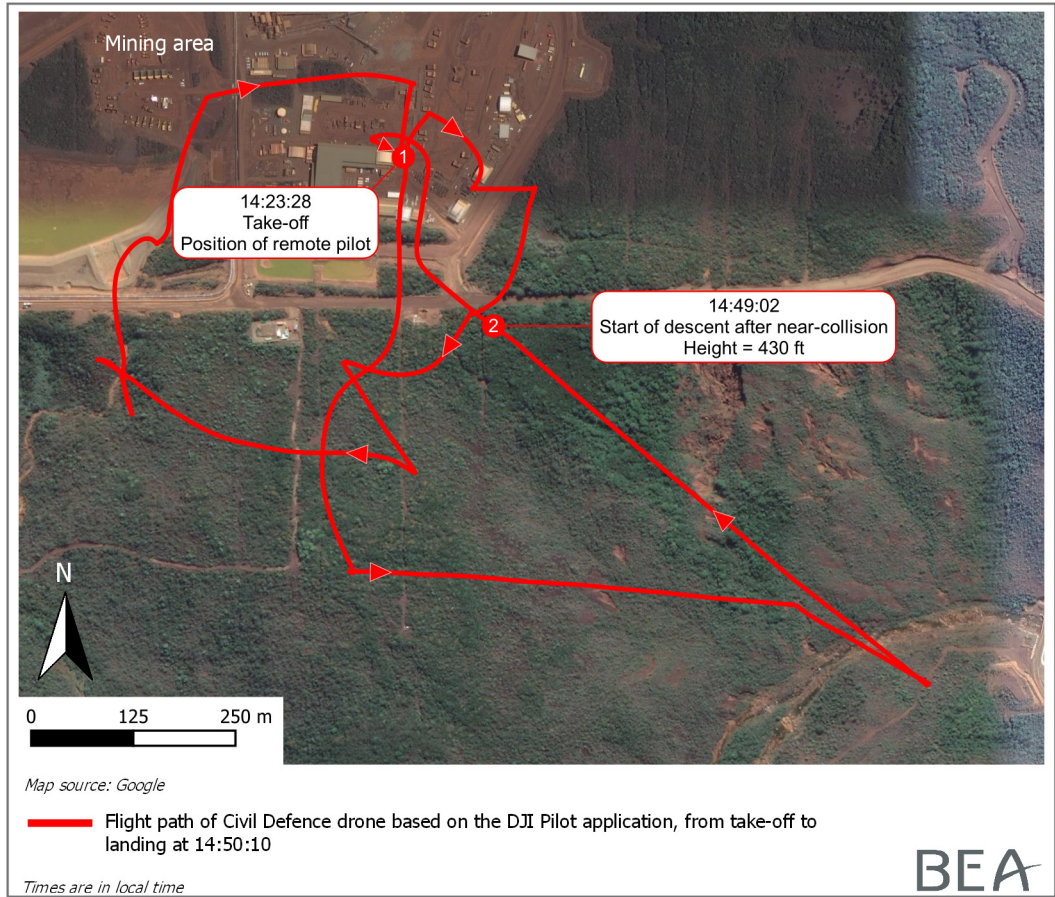


Figure 2: Path of the drone

No path data could be retrieved from the helicopter. The helicopter's onboard equipment does not record path data. Moreover, in New Caledonia, air traffic surveillance is based on the ADS-B system, and the helicopter was not equipped with this technology.

## 2.6 Goro mine NW R4 restricted area

The Aeronautical Information Publication (AIP) indicates that the NW R4 area is an area that must be flown around, except when authorised by the manager for urgent flights, aircraft on safety/rescue missions, and Vale plant aerial missions with 24 hours' notice for aerial work. Within this area, explosives may be used and unmanned aircraft flights may take place.

The area is located in class G airspace and extends from the ground to a height of 1,500 ft, under the TMA of Nouméa-Magenta airport. It is active every day from 7:00 to 18:00.

Under the rules of Class G airspace, the user is not required to report his presence to air navigation services once he has been given clearance to enter the NW R4 area.

## 2.7 Drone operation by the Directorate for Civil Protection and Risk Management of New Caledonia (DSCGR)

To carry out its mission, the Civil Defence operated a Matrice 300 RTK drone, which measures 81 x 67 x 43 cm when unfolded for flight (propellers excluded). It weighs approximately 6.3 kg.



Source: DJI

Figure 3: Matrice 300 RTK drone

Paragraph 5.1.1 of the manual of particular activities of the Civil Defence stipulates that the operator shall ensure that all the pre-flight notifications or agreements required according to the site, the altitude or the nature of the flight have been made or obtained.

Even though it was not mandatory, the Civil Defence team notified the controllers of the Nouméa-La Tontouta tower by phone in the morning before starting the mission at the Goro mine. The air navigation services at Nouméa-La Tontouta airport did not share the information with the controllers of the Nouméa-Magenta tower. It is not specified that these two organisations should coordinate in this case. The Nouméa-Magenta controllers were therefore unable to inform the helicopter pilot of the presence of the drone.

According to the regulations concerning the operation of civilian drones, the Civil Defence is authorised to operate a drone by special dispensation, without requesting the local authorities to issue a NOTAM, when the mission's circumstances warrant it<sup>(5)</sup>. Given the context of the mission and its urgent nature, no NOTAM was issued.

<sup>(5)</sup> Article 10, paragraph 1 of the French order of 17 December 2015 pertaining to the use of airspace by unmanned aircraft (text in force on the day of the incident).

### 3 - CONCLUSIONS

*The conclusions are solely based on the information which came to the knowledge of the BEA during the investigation. They are not intended to apportion blame or liability.*

#### Scenario

The helicopter pilot, accompanied by two passengers, took off from Nouméa-Magenta airport for an aerial photography mission over the Goro mine, within the NW R4 restricted area. On its part, the Civil Defence also performed an aerial photography mission with a drone in this area. The two operators had received clearance from the manager of the restricted area to enter the area and fly over the plant's mining area. However, the helicopter pilot was not informed of the presence of a Civil Defence drone. Likewise, the Civil Defence, which had coordinated with two other helicopter operators for its morning activities, was not informed of the presence of a Helisud helicopter in the afternoon. When the helicopter pilot flew over the Vale plant's mining area, at a height of between 150 and 300 ft, he visually detected the presence of an object flying slightly above his path and performed an evasive manoeuvre. The Civil Defence team detected the presence of the helicopter. The remote pilot had sight of it and landed the drone vertically from where it was after the aircraft crossed paths.

In the absence of path data from the helicopter, the investigation was unable to determine the precise sequence of the near-collision or the exact minimum separation distance between the two aircraft.

#### Contributing factors

The following factors may have contributed to the near-collision between the helicopter and the drone:

- the absence of information from the manager of the restricted area, who did not notify the operator of the drone and the operator of the helicopter of their concurrent presence in the restricted area.

Notifying both operators was all the more necessary because:

- it concerned an area with no other air traffic than that authorised, which might lead the pilot to think, without prior information, that there is less of a risk of an airprox;
- both aircraft were going to fly over the same points of interest within the restricted area.