BEA
Bureau d'Enquêtes et d'Analyses
pour la sécurité de l'aviation civile

www.bea.aero

SAFETY INVESTIGATION REPORT

Incident to the ATR72-212A registered **F-OZKN** on Friday 20 December 2024 at Ouvéa-Ouloup airport (New Caledonia)

Time	Around 19:35[1]
Operator	Air Calédonie
Type of flight	Passenger commercial air transport
Persons on board	Captain (PM[2]), co-pilot (PF), 2 cabin crew members and 68 passengers
Consequences and damage	Tail slightly damaged
This is a courtesy translation by the BEA of the Final Report on the Safety Investigation. As accurate as the translation may be, the original text in French is the work of reference.	

Limited external visual references, early flare, tailstrike with runway, at night

1 HISTORY OF THE FLIGHT

Note: the following information is principally based on the CVR and FDR, and statements.

The crew took off at 19:02, approximately one hour behind schedule, from Nouméa-Magenta airport (New Caledonia) bound for Ouvéa-Ouloup airport.

At 19:15, at the crew's request, the Ouvéa AFIS officer transmitted the following information: runway 31 in use, wind from 350° of 1 kt, CAVOK, temperature 27°C, dew point temperature 24°C, QNH 1006. He specified that the runway was dry.

Around ten minutes later, the PF started the approach briefing during which he mentioned the threats that he had identified, namely that the runway was short and that they were landing at night at Ouvéa. He also specified that they would be carrying out an RNP type approach to runway 31 and that he planned to disconnect the autopilot at 600 ft for an MDA of 530 ft. After the briefing, the crew started the descent to the altitude of 1,700 ft.

At 19:31, the approach mode was selected. One minute later, the crew controlled the extension of the flaps to flaps 15 (first position). The indicated airspeed was 177 kt. The crew then controlled the extension of the landing gears and 20 s later, the flaps to flaps 30 (second position).

[1] Except where otherwise indicated, the times in this report are in local time.
[2] The glossary of abbreviations and acronyms frequently used by the BEA can be found on its web site.

At 19:34, the aeroplane descended through 2,000 ft at 5.2 NM from the threshold of runway 31 at Ouvéa and at an indicated airspeed of 112 kt. The crew carried out the before landing checklist before starting the final approach. The PM than indicated to the Ouvéa AFIS officer that they were going to land. The AFIS officer replied that the wind was calm.

At 19:35, the captain told the co-pilot that he had only landed three times on runway 31 at Ouvéa since becoming captain. The co-pilot replied that this was the first time for him. After this discussion, the PF disconnected the autopilot and yaw damper. The aeroplane descended through 650 ft at 1.5 NM from the threshold of runway 31 at a speed of 110 kt[3] and with a nose-down attitude of 1.2°.

In order to follow the PAPI approach slope which is steeper than the RNP approach slope, the PF made a slight nose-down input associated with a reduction in engine torque which went from 18% to 5% in two seconds. The pitch attitude decreased to -3.4°. The PF progressively increased the torque to 15%. At 19:36:07, the aeroplane was at a height of 500 ft, the pitch attitude was once again between 1 and 2° nose down and the speed was 110 kt. The aeroplane passed slightly below the descent slope for around 1 NM. The approach remained stabilized, which was called out by the PM, in accordance with the Air Calédonie stabilization criteria (see paragraph 4.2.1). The slope was intercepted at a height of 200 ft.

A few seconds later, at a height of around 150 ft, the PF increased the engine torque to 27% for three seconds until near the threshold of runway 31 at a height of around 60 ft. The PF then completely reduced the engine torque and started making an input on the control column which, in six seconds, resulted in the pitch attitude changing from 1.6° nose down to 6.4° nose up. The main landing gear and the tail came into contact with the runway with a vertical load factor of 2.2 g. The main landing gear came into contact with the runway[4] again after a small bounce.

The crew continued the landing and then taxied to the stand where they observed the damage on the fuselage.

2 CONTEXT INFORMATION

2.1 Meteorological information

Météo-France indicated that between 19:00 and 20:00, the sky was cloudy with clouds based between 3,000 and 4,000 ft. No precipitation was observed during this period and visibility was greater than 10 km. The wind was light, sometimes still, and dominantly from the north. At the time of the incident, the night was dark (the moon had set).

[3] Vapp of 106 kt, see paragraph 3.1.

[4] The aeroplane's pitch attitude was 1° nose down.

2.2 Aerodrome information

Ouvéa-Ouloup airport is situated on Ouvéa island at an altitude of 24 ft. It is principally surrounded by forest with a few low-lit dwellings. It has a paved runway 13-31 measuring 1,100 m x 30 m. The LDA for runway 31 is 1,100 m (1,000 m for runway 13). When runway 31 is in use, the following lights are available:

Runway 31 in use	Lights
Runway threshold	Green
Opposite end of runway	Red
Runway edges	White

The regulations do not impose runway centreline lights.

The PAPI of each QFU is calibrated on a slope of 3.8° (6.7%) to clear obstacles[5].

The RNP approach procedure for runway 31, followed by the crew during the incident flight, includes an intermediate approach segment at 1,700 ft on a 311° track. At the FAF situated at 4.4 NM from the threshold of runway 31, the final approach is on a 3.5° (6.1%) slope to the MDA of 530 ft (i.e. a height of 500 ft above the runway threshold) for LNAV approaches (followed by Air Calédonie) and for category B aeroplanes such as the ATR 72.

From the MDA, there is then a change in slope between the slope of the RNP approach procedure and the PAPI slope of 3.8° for runway 31.

Note: even if it is recommended that the descent slope of an instrument approach procedure is as close as possible to the PAPI slope, it can happen that due to the presence of obstacles or variations in temperature, the effective descent slope is not identical to the PAPI slope. In this case, crews cannot observe the two red and two white lights of the PAPI when passing from instrument flight to visual flight. Precautions are thus taken for designing these procedures, based on specifications defined by ICAO for example, with the aim of limiting the risks arising from a difference between the descent slope and the PAPI slope. Furthermore, when this difference is more than 0.2°, specific information is published on the approach chart.

The following information is available on the Ouvéa Ouloup approach chart:

- in the warning inset situated on the chart's plan view, it is indicated that the final approach slope (glide path) is different to the PAPI slope (see **Figure 1**);
- on the longitudinal profile, the PAPI slope is represented with its values.

[5] For example, the altitude of the threshold of runway 31 is 24 ft and obstacles at around 1,000 m from this threshold culminate at a height of 138 ft.

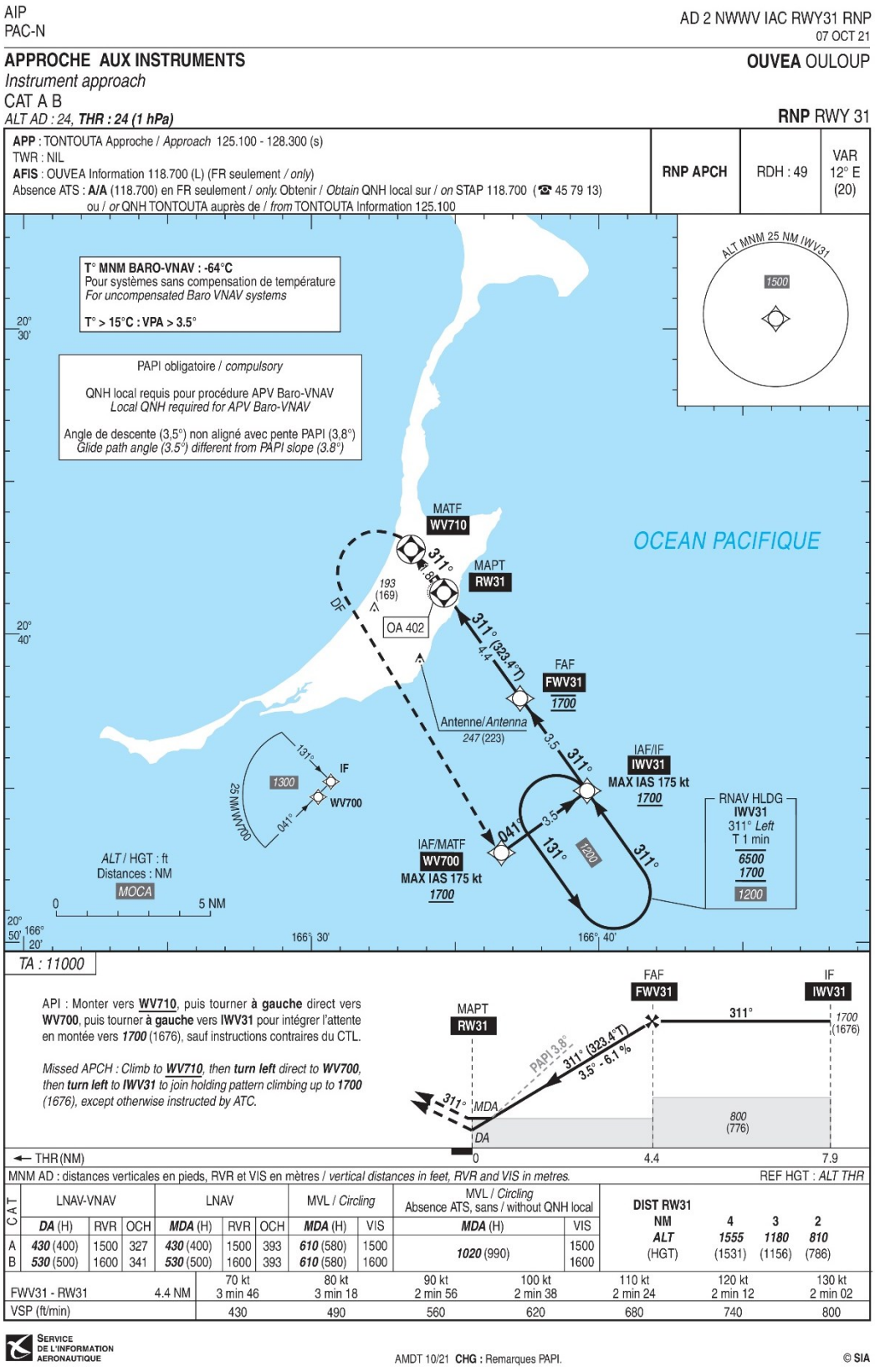

Figure 1: chart associated with RNP approach procedure for runway 31 (source: SIA)

2.3 Comparison with other airports served by Air Calédonie

The airports on Loyauté island (Ouvéa, Lifou, Maré) and Pins island are all equipped with identical low-brightness lighting and threshold identification lights. The environmental luminosity around these airports is limited due to the low density of the population and the proximity of the ocean. They all have a LDA of 1,250 m, 150 m longer than the LDA of Ouvéa airport. The RNP approach slopes correspond to those of the PAPI and are between 3 and 3.7°.

The LDA on runway 17 at Nouméa-Magenta airport is 1,019 m and the PAPI slope is 4°. The instrument approach to runway 17 is a visual manoeuvre with prescribed track. The airport is close to the towns of Nouméa and Magenta with greater environmental luminosity than on the islands mentioned above.

The Air Calédonie fleet can be operated by day or night, under IFR or VFR (by day only). However, nearly all the flights are scheduled for the daytime.

3 AIRCRAFT INFORMATION

3.1 Approach and landing procedures

F-OZKN is an ATR 72-212A built in 2017. The calculated take-off weight was 20.8 t, the expected landing weight was 20.4 t with a centre of gravity of 25.4% MAC within the envelope specified in the flight manual.

In these conditions:

- the calculated Vapp and Vref speeds were 106 kt;
- the Landing Distance at Time of Arrival (LDTA) was 770 m for an LDA of 1,100 m (see paragraph 2.2), i.e. a margin of 330 m (or in other terms, an LDA of 140 % more than the LDTA).

Note: the LDTA is the achievable landing distance in normal operating conditions based on landing performance data and the associated procedures determined for the conditions prevailing at the time of landing. In commercial air transport[6], no approach to land shall be continued unless the LDA on the intended runway is at least 115% of the LDTA.

The FCTM[7] indicates that for an approach on a 3° slope, with the landing gear extended, the recommended engine torque pre-set is 25%, which results in a nose-down attitude of between 0 and 3° during the approach. A correction of plus or minus 5% of engine torque must be applied for an approach slope variation of plus or minus 1°. Therefore, for the approach to Ouvéa following the 3.8° PAPI slope, the torque pre-set is approximately 20%.

The FCTM specifies that when the aeroplane is stabilized on the approach at Vapp, on a 3° slope, the pitch attitude should be between 2.5° nose down and 1° nose up. A nose-down attitude of more than 2.5° may indicate excess energy. The FCTM also recommends starting the flare at a height of 20 ft by completely reducing power and progressively adjusting the pitch attitude.

[6] Commission regulation (EU) No 965/2012, known as Air OPS, paragraph CAT.OP.MPA.303 (Version in force on the day of the incident).

[7] Flight Crew Training Manual – September 2022 edition

The tail will strike the ground when there is a pitch attitude of between 5.9° when the main landing gear is compressed and 8°.

3.2 Damage to aeroplane

The ATR 72 is equipped with a tail bumper, at the rear of the aeroplane, under the fuselage. It is designed to dampen any tailstrike with the runway (see **Figure 2**). During the walk-around inspection, the pilot checks that there are no marks on the red lines which indicate whether the tail bumper has been compressed or not.

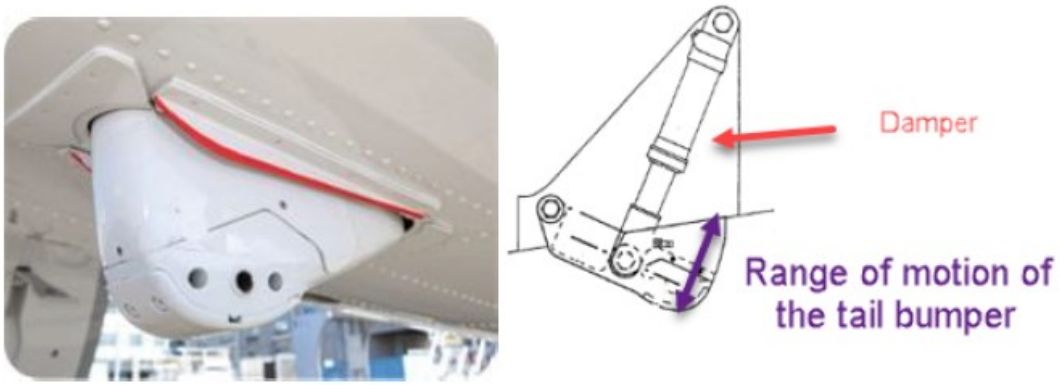

Figure 2: tail bumper (source: ATR)

After the incident, the crew observed the presence of marks on these red lines which led to an inspection by the operator's maintenance department. This inspection took place on 21 December 2024 and did not reveal any additional damage.

4 OPERATIONAL INFORMATION

4.1 Crew information

4.1.1 Captain

The 54-year-old captain held an Airline Transport Pilot Licence (ATPL(A)) obtained in 2010 along with the ATR42/72 type rating, an FI(A) and TRI (MPA) instructor rating and IR/PBN ME ratings. On the date of the serious incident, he had logged a total of 14,490 flight hours, including 8,050 hours on type. He had logged 1,470 night flight hours, including around 3 hours in 2024, all carried out before May.

There were six planned legs the day of the incident, the last two legs were the return flight between Nouméa and Ouvéa.

The captain indicated that during the cruise flight, he and the PF had seen a storm zone with rain on the weather radar. He specified that this zone had been easy to circumnavigate. He stated that avoiding it in order to join runway 13 at Ouvéa, used in the majority of cases and with a shorter landing distance than runway 31, might have considerably increased the flight time and led to a landing with a tailwind component. The captain added that due to the threats associated with a night landing at Ouvéa, he and the PF decided not to carry out a visual approach and to follow the RNP approach in full with the autopilot engaged.

The captain considered that up to the flare, the approach was stabilized and standard. Just before the flare, he observed a slight variation in the nose-up attitude which caused the aeroplane to rise. He considered that this variation in pitch could be explained by a corrective input on the control column made by the PF. He specified that contact with the runway was firm as it can sometimes be. Except for the slight variation in pitch attitude, the captain indicated that everything was stable.

With respect to Ouvéa airport, the captain indicated that the runway is the least lit of all Air Calédonie's destinations. He specified that it was the island with the least light pollution, with a lot of forest which could give the impression of a "black tunnel" during the approach and landing. He also mentioned the sensation of a black hole on landing at night at Ouvéa. The captain avoided carrying out visual approaches at night to Ouvéa and preferred following the published instrument approach path. He added that the flights bound for Ouvéa are principally scheduled for the daytime. The captain explained that he had little night experience at Ouvéa: less than ten landings by day and night on runway 31. He could no longer remember when he had last landed at night on runway 31.

The captain indicated that when he was PF, he flared from 20 ft, by reducing power and making a light nose-up input to place the top of the instrument panel on the end of the runway. He specified, however, that he flared by instinct, in a natural way. As PM, he particularly monitored the speed and the PAPI on short final and landing. He specified that there were a lot of differences between one co-pilot and another for the flares which made the task of PM difficult during landings. He nevertheless ensures that he hears a variation in power to identify that the PF has started the flare.

4.1.2 Co-pilot

The 34-year-old co-pilot held a Commercial Pilot Licence (CPL(A)) obtained in 2021 along with the ATR 42/72 rating, a FI(A) instructor rating and IR/PBN ME ratings. On the date of the incident, he had logged a total of 1,000 flight hours, including 678 hours on type. Since joining Air Calédonie in 2023, the co-pilot had landed as PF ten times at Ouvéa including one time on runway 31 on 2 February 2024, around 25 min before the start of the aeronautical night[8]. He had logged 68 night flight hours, including 28 min in 2024.

The co-pilot described Ouvéa airport at night as a black hole with very few light references around the airport. He explained that he was in the habit of initiating the flare when the 20 ft call was made but that in this type of particular situation, such as landing at night at Ouvéa, he tended to initiate it as soon as he could see the runway threshold on approach. The co-pilot indicated that he had little experience at Ouvéa on runway 31 as runway 13 was used most of the time. The co-pilot indicated that at around 200 ft, he briefly saw three red lights and one white light of the PAPI. He intercepted the slope. He considered that he started his flare and the reduction in power too high.

[8] For latitudes below or at 30°, night as defined by the implementation provisions in France of modified Commission Implementing Regulation (EU) No 923/2012 (known as SERA), begins 15 min after sunset and ends 15 min before sunrise.

4.2 Operator information

4.2.1 Operational procedures

The Air Calédonie Operations Manual (OM) indicates that only RNP LNAV approaches are authorized.

The stabilization criteria in the Air Calédonie OM are:

- aeroplane on the runway axis and on a descent slope with variations in heading of less than 10° and a rate of descent of +/- 300 ft/min with respect to the target value;
- not more than one dot of deviation in lateral guidance and within +/- 100 ft of vertical guidance for approaches such as the RNP LNAV;
- appropriate adjustment of engine power according to configuration and weight;
- bank less than 50° and wings horizontal below 300 ft;
- indicated airspeed between Vapp – 5 kt and Vapp + 10 kt;
- rate of descent less than 1,000 ft/min.

4.2.2 Approach briefing

The OM specifies, for the approach briefing, to discuss “at least” the following points:

- description of anticipated path;
- threats identified and mitigation means implemented.

5 ADDITIONAL INFORMATION

5.1 Similar occurrences

Based on the ten incidents between 2015 and 2024 where the tail of an ATR72 struck the runway, the following points emerge:

- a bounce then an increase in pitch attitude associated with a reduction in speed;
- an early flare with an excessive pitch attitude and sometimes dual pilot inputs;
- a non-stabilized approach, principally associated with a high rate of descent just before landing;
- a reduction in the indicated airspeed before the flare due to windshear.

5.2 EASA Safety Review for 2024

The Safety Review published by EASA in 2025 reveals that for the year 2024, most accidents and serious incidents involving commercial air transport complex aeroplanes concerned mid-air collisions, abnormal runway contact and the failure of systems/components other than the powerplant. According to the report, the number of accidents and serious incidents during landing in 2024 was higher than the average value of the previous ten years[9].

5.3 Night landings

At night, when the landing area is not lit or when the lighting is weak, the perception of depth is particularly affected, making it difficult to estimate the distance and height relative to the aiming point on short final. According to the Airplane Flying Handbook published by the FAA, a pilot with little experience of night flight may have a tendency to flare too high.

[9] This trend is accentuated in 2024 in general aviation (NCO) according to the EASA safety review.

6 CONCLUSIONS

The conclusions are solely based on the information which came to the knowledge of the BEA during the investigation.

Scenario

During the arrival briefing before the start of the descent, the PF identified the short runway at Ouvéa and the night landing as threats. The crew agreed to keep the autopilot engaged until the minima to mitigate these threats. Around ten minutes later, during the descent, each crew member indicated their small amount of experience of landing at night on runway 31 at Ouvéa. These admissions were not the subject of a formal assessment of the associated risk(s) and possible measures to be envisaged. On disconnecting the autopilot at the minima, the PF intercepted the PAPI approach slope which is steeper than the RNAV LNAV approach slope for runway 31 (see paragraph 2.2). The approach remained stable.

On approaching the threshold of runway 31 with limited external visual references due to the dark night, at a height of around 60 ft, i.e. 40 ft higher than ATR's recommended value for the flare, the PF reduced power and made a strong nose-up input causing the aeroplane to rise slightly and increasing the nose-up attitude up to 6.4° before the tail struck the runway. The crew continued the landing and then taxied to the stand where they observed the marks on the tail bumper.

Contributing factors

The following factors may have contributed to an early flare and then a tailstrike with the runway during the night landing:

- the crew's small amount of overall and recent experience in night landings in a dimly lit environment as at Ouvéa airport where landings are usually scheduled in the day by the operator;
- no mention of the piloting technique for landing, based on the risk identified by the crew and associated not only with limited external visual references, but also with their small amount of experience in these conditions and on runway 31 at this airport which has a steep approach slope (greater than 3.5°).

Measures taken

Air Calédonie information bulletin concerning the tailstrike risk

Air Calédonie has sent an information bulletin to its pilots about the tailstike risk. This bulletin specifies the pitch attitude that can lead to the tail striking the ground (see paragraph 3.1). It also describes the factors that can lead to this tailstrike (i.e. excess energy at landing or height of flare) before mentioning both the importance of holding a stabilized approach path and the landing technique.

Safety messages

Factors influencing piloting actions during landing

As the EASA Safety Review specifies (see paragraph 5.2), data relating to accidents and serious incidents in recent years, and particularly in 2024, highlights the predominance of approach and landing factors. Managing and controlling the landing can be influenced by numerous elements, such as the environmental conditions (runway specificities, visibility, wind or terrain, for example) or the skills of the pilot who must also be familiar with the characteristics of the aircraft being flown. Landing techniques are often set out by the design bodies of commercial transport aeroplanes and are available in the manuals provided to crews. The experience gained, external visual references used and environmental conditions lead to adjustments of these recommended techniques. These adjustments can be difficult to monitor by a PM during the flare, a dynamic flight phase and a transition.

The BEA investigations are conducted with the sole objective of improving aviation safety and are not intended to apportion blame or liabilities.