



Summary report

With regard to this serious incident, a summary investigation was carried out in accordance with Article 45 of the Ordinance of 17 December 2014 on the Safety Investigation of Transportation Incidents (OSITI), status as of 1 September 2023 (SR 742.161). The sole purpose of the investigation into an accident or serious incident is to prevent further accidents or serious incidents from happening. It is therefore expressly not the purpose of the safety investigation and this report to establish fault or liability. If this report is used for purposes other than accident prevention, this fact must be taken into account.

Aircraft	Airbus Helicopters MBB-BK117 D-2 (H145)	HB-ZQH
Operator	Schweizerische Luft-Ambulanz AG, PO Box 1414, 8058 Zurich	
Owner	Schweizerische Luft-Ambulanz AG, PO Box 1414, 8058 Zurich	
Pilot	Swiss national born 1979	
Licence	Airline Transport Pilot Licence Helicopter (ATPL(H)) according to the European Union Aviation Safety Agency (EASA), issued by the Federal Office of Civil Aviation (FOCA)	
Flying hours	total 5,615 hrs on aircraft type 54 hrs	during the last 90 days 57 hrs during the last 90 days 54 hrs
Location	1km west of Rüedisbach (BE)	
Coordinates	619 227 / 218 620 (Swiss Grid 1903) N 47° 07' 06" / E 7° 41' 31" (WGS ¹ 84)	Altitude 628 m/M
Date and time	18 January 2021, 13:50 (LT ² = UTC ³ + 1 hr)	
Type of operation	Rescue flight	
Flight rules	Sichtflugregeln (<i>Visual Flight Rules</i> –	
Point of departure	Rüedisbach (BE)	
Destination	Rüedisbach (BE)	
Flight phase	Hovering	
Nature of the serious incident	Serious incident during a rescue operation	

¹ WGS: World Geodetic System: The WGS 84 standard was adopted for aviation by the International Civil Aviation Organization (ICAO) in 1989.

² LT: Local Time, standard time

³ UTC: Universal Time Coordinated

Injuries to persons	Crew members	Passengers	Third parties
Slightly injured	0	0	0
Not injured	3	1	Not affected

Damage to aircraft	Not damaged
Damage to third parties	None

Facts of the case

Course of events

The Airbus Helicopters H145 helicopter, registered as HB-ZQH, took off from the Rega base at Bern Airport (LSZB) at 2pm on 18 January 2021 for a mission to Ruedisbach (BE) to rescue a forestry worker who had had an accident. The crew consisted of a pilot, a paramedic (HEMS crew member – HCM) and a doctor (medical crew member – MCM).

Because of the steeply sloping terrain and the lack of other rescue options, the forestry worker had to be rescued using the rescue winch. Having suffered a blow to the head, the patient was somewhat confused. However, he was responsive and his reactions appeared normal. The MCM prepared the patient for recovery with the horizontal net and positioned him in a lying position as intended (see Figure 1).

The patient and the MCM were then winched out of the forest. During the rescue, at a height of around 10 to 15 metres above the ground, the patient suddenly sat up in the net and clung to the MCM. The MCM was surprised and immediately reported what had happened via radio. At the same time, the HCM, who was operating the winch, reported to the pilot that the patient had sat up and that he should be flown immediately and directly to the transfer point, which was only a few metres below the scene of the accident. The HCM carefully extended the winch simultaneously to reduce the distance between the two people on the winch and the ground. The pilot and the winch operator set the MCM and the patient, who was still sitting in the net, down on the snow-covered meadow.

The patient was transferred to the stretcher and flown to hospital without further incident.



Figure 1: Stock image of a patient being rescued by winch in a horizontal net. Source: Rega.

Findings

The horizontal net with the designation HN3 has been used by Rega for more than 50 years. According to the manufacturer Airwork & Heliseilerei GmbH, the HN3 is also used by the Swiss Air Force and by a small number of flight operations companies abroad. The HN3 horizontal net is a rescue device that is especially used to rescue patients in rough terrain. The MCM can pack the patient into the HN3 without the help of a third party.

In the last 25 years, Rega is aware of three incidents in which a patient was transported in a sitting position in a horizontal net. No patient was harmed in any of these incidents.

Training and measures taken

MCMs are trained in the use of the HN3 by Rega instructors during their basic training. If MCMs do not use the horizontal net during an operation, they must complete monthly training on the crane in the hangar under the supervision of an HCM. The training sessions are documented in the MCM's permit. The basis for education and training is the SOP⁴ "Use of a rescue winch".

Following the incident, Rega carried out a risk assessment on the use of the horizontal net under its internal Safety Management System (SMS). Despite the very low probability of an incident occurring in which a patient sits up in the horizontal net, systemic measures have been introduced to further minimise the risk:⁵

- Rega MCMs are trained in the correct use of the HN3 and made aware of possible dangers and how to mitigate them during their basic training, monthly training sessions and annual checks by internal instructors. These are mandatory for all MCMs.
- In the SOPs describing the use of the horizontal net, the following addition has been made to the internal instructions: *"If the patient shows signs of agitation, transportation in the horizontal net must be carefully considered."*
- MCMs are trained to optionally attach carabiners to the net in the area of a restless patient's upper body and legs in order to additionally secure the patient in the net.

Analysis and conclusions

The MCM prepared the patient in the horizontal net according to standard operating procedures. The MCM was taken by surprise when the patient sat up during the winch rescue. The fact that he immediately informed the crew of this by radio was sensible and appropriate to the situation. The reaction of the HCM, who carefully deployed the winch as a result, and the pilot, who immediately flew to the transfer point, was in observance of all safety precautions and defused the situation.

The Rega flight operations company subsequently carried out a root cause analysis, and operational and technical measures were subsequently taken to reduce the risks associated with the use of the HN3 horizontal net.

The HN3 horizontal net is also used by the Swiss Air Force and other flight operations companies abroad. It is also conceivable that a similar issue could exist with horizontal nets from other manufacturers. The measures listed in this report can generally contribute to a reduction in risk when horizontal nets are used in the same way.

As no further results are to be expected that would help to prevent such an incident, the STSB, based on Article 45 OSITI, has decided not to take further investigative steps and concludes the investigation with this summary report.

The German version of this report is the original and therefore authoritative.

Bern, 21 November 2023

Swiss Transportation Safety Investigation Board

⁴ SOP: standard operating procedure

⁵ Rega's risk assessment revealed a probability of occurrence of less than once in 10 years.