



# Ambulance Helicopter Accident in Åland on February 12, 2022



L2022-01

## FOREWORD

Pursuant to section 2 of the Safety Investigation Act (525/2011), the Safety Investigation Authority of Finland (SIAF) decided to investigate an ambulance helicopter accident that occurred in Åland on February 12, 2022. The purpose of a safety investigation is to promote general safety, the prevention of accidents and incidents, and the prevention of losses resulting from accidents. A safety investigation is not conducted in order to allocate legal liability.

Air traffic control officer (retired) Timo Heikkilä was appointed the investigation team leader. The appointed team members were helicopter pilot Jari Hjerppe, Senior Safety Investigator Heikki Harri, Rescue Service Expert Knut Lehtinen and Sea Captain Bengt Malmberg. The investigator-in-charge was Chief Air Safety Investigator Janne Kotiranta.

The Bureau of Enquiry and Analysis for Civil Aviation Safety (BEA) of France and The Swedish Accident Investigation Authority (SHK) appointed an accredited representative to the investigation in accordance with ICAO Annex 13.

The safety investigation examines the course of events, their causes and consequences, search and rescue actions, and actions taken by the authorities. The investigation specifically examines whether safety had adequately been taken into consideration in the activity leading up to the accident and in the planning, manufacture, construction and use of the equipment and structures that caused the accident or incident or at which the accident or incident was directed. The investigation also examines whether the management, supervision and inspection activity had been appropriately arranged and managed. Where necessary the investigation is also expected to examine possible shortcomings in the provisions and orders regarding safety and the authorities' activities.

The investigation report includes an account of the course of the incident, the factors leading to the incident, and the consequences of the incident as well as safety recommendations addressed to the appropriate authorities and other actors regarding measures that are necessary in order to promote general safety, prevent further accidents and incidents, prevent loss, and improve the effectiveness of actions conducted by search and rescue and other authorities.

An opportunity is given to those involved in the accident and to the authorities responsible for supervision in the field of the accident to comment on the draft investigation report. These comments have been taken into consideration during the preparation of the final report. A summary of the comments is at the end of the report. Pursuant to the Safety Investigation Act, no comments given by private individuals are published.

The investigation report was translated into Swedish by Gramo and into English by TK Translations.

The investigation report and its summary were published on the SIAF's internet page at [www.turvallisuustutkinta.fi](http://www.turvallisuustutkinta.fi) on 28 February 2023.

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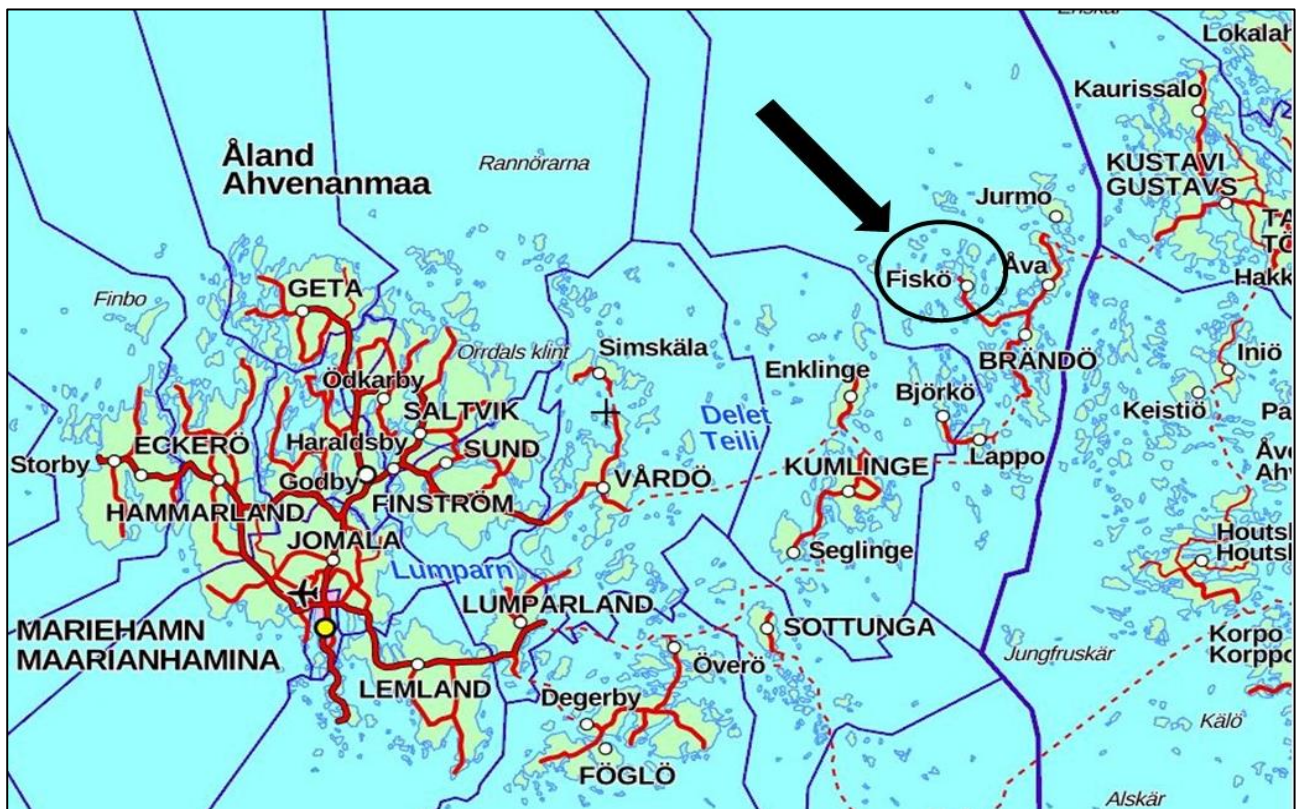
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# 1 EVENTS

## 1.1 Sequence of Events

On Saturday, February 12, 2022, at 1533 h<sup>1</sup> the public safety answering point (PSAP) in Åland received an emergency call indicating that a person had sustained injuries in a falling accident. Information of the accident location was initially ambiguous. The caller stated that the accident had occurred on Norrvikenvägen in the community of Norrviken, on Fiskö Island in the municipality of Brändö. After the PSAP operator explained that a road by that name was unknown, the caller said that the road was, in fact, named Bodholmsvägen.



**Kuva 1.** The location of Fiskö Island in Brändö municipality in Åland. (Background map: National Land Survey of Finland, topographic map, open data, 11/21)

At 1541 h, the operator called the public health nurse in Brändö and reported the accident. They agreed that the nurse should call the person who made the emergency call for further information. At 1550 h, the operator, the paramedic field commander and the nurse decided to dispatch an ambulance helicopter from Mariehamn to the accident location.

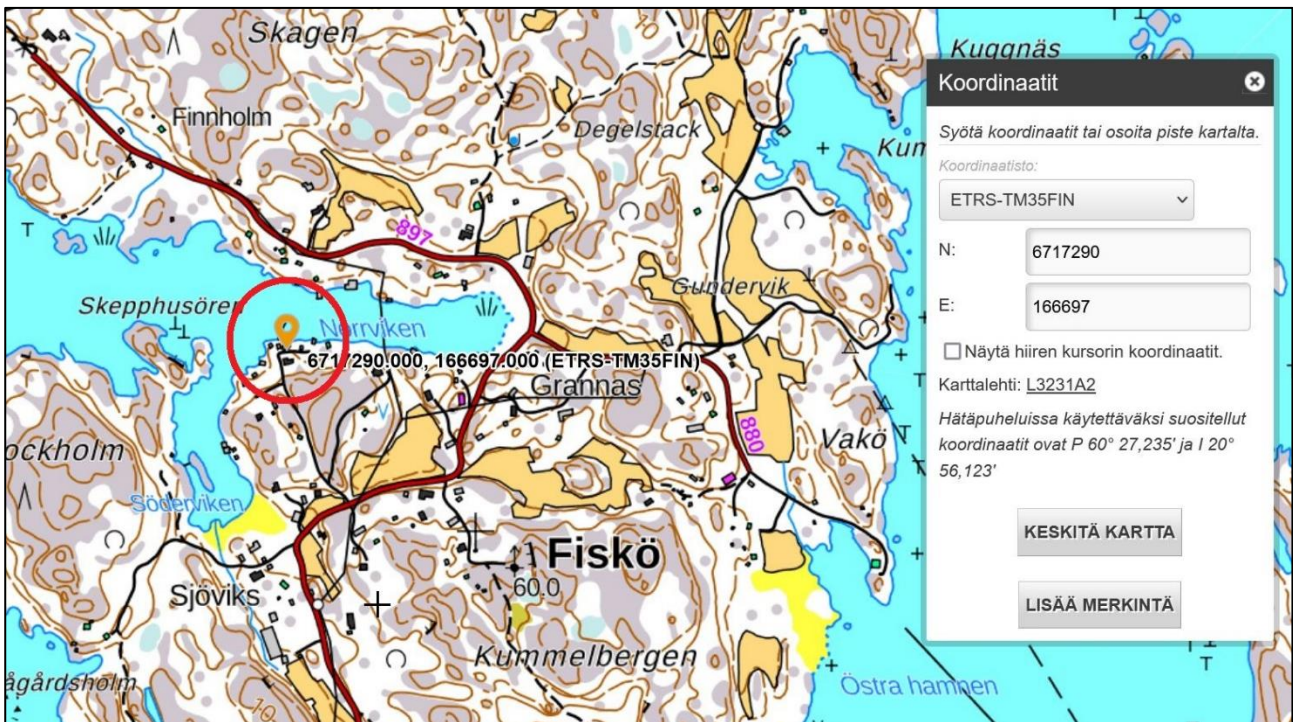
At 1600 h, the PSAP notified the helicopter crew consisting of a pilot, a helicopter emergency medical service technical crew member and a flight nurse, of a patient in Brändö. The task code was 745C “falling accident.”<sup>2</sup>

<sup>1</sup> The times given in this report are Finnish time.

<sup>2</sup> Emergency response organizations use task codes to report the nature of an occurrence to other authorities. A full code consists of a numerical descriptor of the nature of the occurrence followed by a letter (A, B, C or D) that indicates the urgency category.

Soon after takeoff the crew received target coordinates (60°25.2130'N, 20°59.7001'E) via the nationwide public safety network<sup>3</sup> and cell phone. These matched the location of the helipad on Korsö Island, approximately 15 min flying time away.

At 1610 h, about halfway into the flight, the PSAP called the crew informing that the patient was on Fiskö. Because the distance from Fiskö to Korsö precluded transport of the patient to the helipad before the helicopter's arrival, the PSAP suggested that the crew proceed direct to the accident site at 60°27.1315'N, 20°56.1865'E, about 5 km northwest of the helipad.



**Kuva 2.** The accident site location derived from the rescue department's report. (Background map: National Land Survey of Finland, topographic map, open data, 11/21)

At 8 km from the accident site, the pilot descended to 500 ft (150 m) above ground level. During the approach, he reduced speed so he could identify the correct house among the buildings of the small community. The PSAP had told the crew that someone would be outside waving a white cloth to help in identification. The crew did not obtain visual contact with this person or the house during the first overflight, but during the second they spotted the house and agreed on the conduct of an off-airfield landing. Even though buildings, trees and a power line were observed in the area, the vicinity of the intended landing site and the approach path were clear of obstructions that could have jeopardized the landing.

The pilot stated that the yard of the house would offer a suitable landing site, adding that the site was somewhat challenging, yet of adequate size. The approach and departure paths were clear of obstructions and ensured a safe escape route in the event of a go-around. The pilot flew a normal approach, descending and reducing airspeed before arriving at the landing decision point (LDP)<sup>4</sup>. On reaching the LDP, he decided to continue approach and land.

<sup>3</sup> Known as Virve network, a mission control tool for communication by authorities and other mission critical operators.

<sup>4</sup> The landing decision point is used in determining landing performance from which, an engine failure having been recognized at this point, the landing may be safely continued or a balked landing initiated.

The yard was bordered by sheds and other buildings with loose objects stored alongside. A boat was stored against the wall of a shed located to the right of the direction of landing. The helicopter cleared a tall birch tree, also to the right of the approach path, by about 6 m. After the pilot had brought the helicopter to hover, the crew member opened the door and scanned the area below and to the left for any obstructions that would be a factor during landing. He notified the pilot of a bush to the left of the helicopter's tail about 6 m away but paid no particular attention to the fact that the ground was partially covered with ice.

Since the landing site appeared good, the pilot elected to land. Even though landing was uneventful, and the helicopter appeared stable after setdown, the pilot felt it was slightly tilted to the right. With the flight controls neutralized, the attitude indicator showed 2° to 3° right bank, well below the maximum permitted value of 8°. The pilot set the engines to idle.

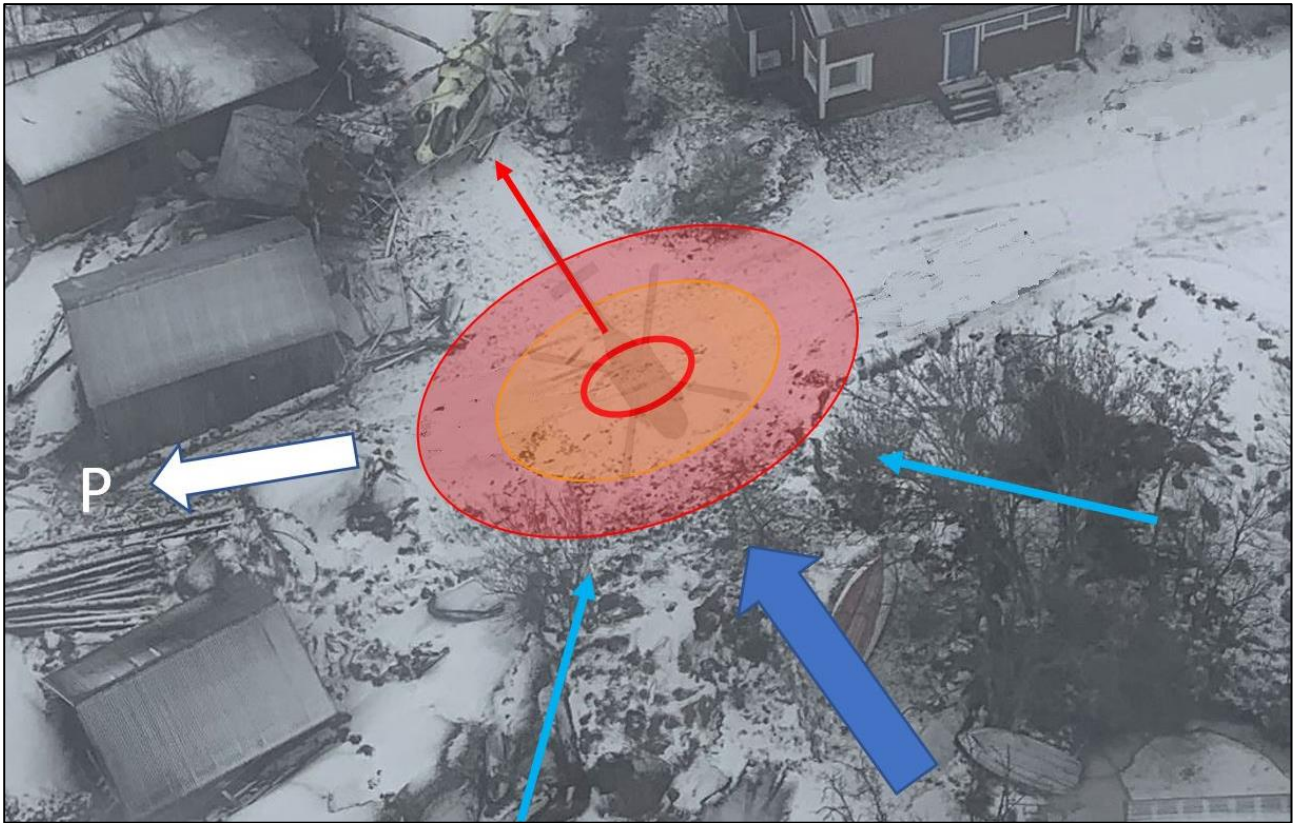
At the same time, the crew's attention shifted momentarily to a person approaching the helicopter from the left. The crew member used hand signals to indicate this person to stand off. Seconds after the pilot had set the engines to idle, the helicopter began to slide tail first on the ice-covered driveway at increasing speed until, after approximately 20 m of travel, the main rotor struck a boat shed to the right of the helicopter. The impact rotated the helicopter towards the shed, and the right side of the fuselage hit the wall. During the slide, the pilot decided that, since the engines were at idle and their spool-up to takeoff power would have taken several seconds, insufficient time was available for liftoff. He did not apply the rotor brake because this would likely have resulted in abrupt yaw or other uncontrollable motion.

The main rotor blades sustained severe damage on impact. Because the helicopter was unstable and vibrating violently, the pilot was unable to shut down the engines by operating the switches in the lower center instrument panel and therefore elected to press the emergency shutdown switches located below the glareshield.

After the motion stopped and the engines had spooled down, the pilot asked the other occupants to report their condition. The pilot and the crew member were uninjured. The nurse, occupying a rear seat, did not respond at first. When the pilot repeated his question, the nurse answered that she was more or less okay. The crew member went to the cabin to check the nurse's condition. The nurse complained back pain but was able to move her arms and legs. The crew member decided that the nurse needed to be transported to a hospital.

At 1630 h, he called the PSAP and reported the accident, adding that the nurse had hurt her back, and requested transportation to a hospital. At the same time, the pilot set the master switches and other electrical equipment to "off" and then called the area control center to report the accident. He made an external inspection for fuel and fluid leaks and ensured that the area around the helicopter was safe, then re-entered the helicopter and called the operator's (Babcock Scandinavian AirAmbulance) hotline to report the accident. Then he exited the helicopter and went to check the nurse's condition. When he learned that the nurse had sustained back injury, he advised the nurse to refrain from moving and wait for help.

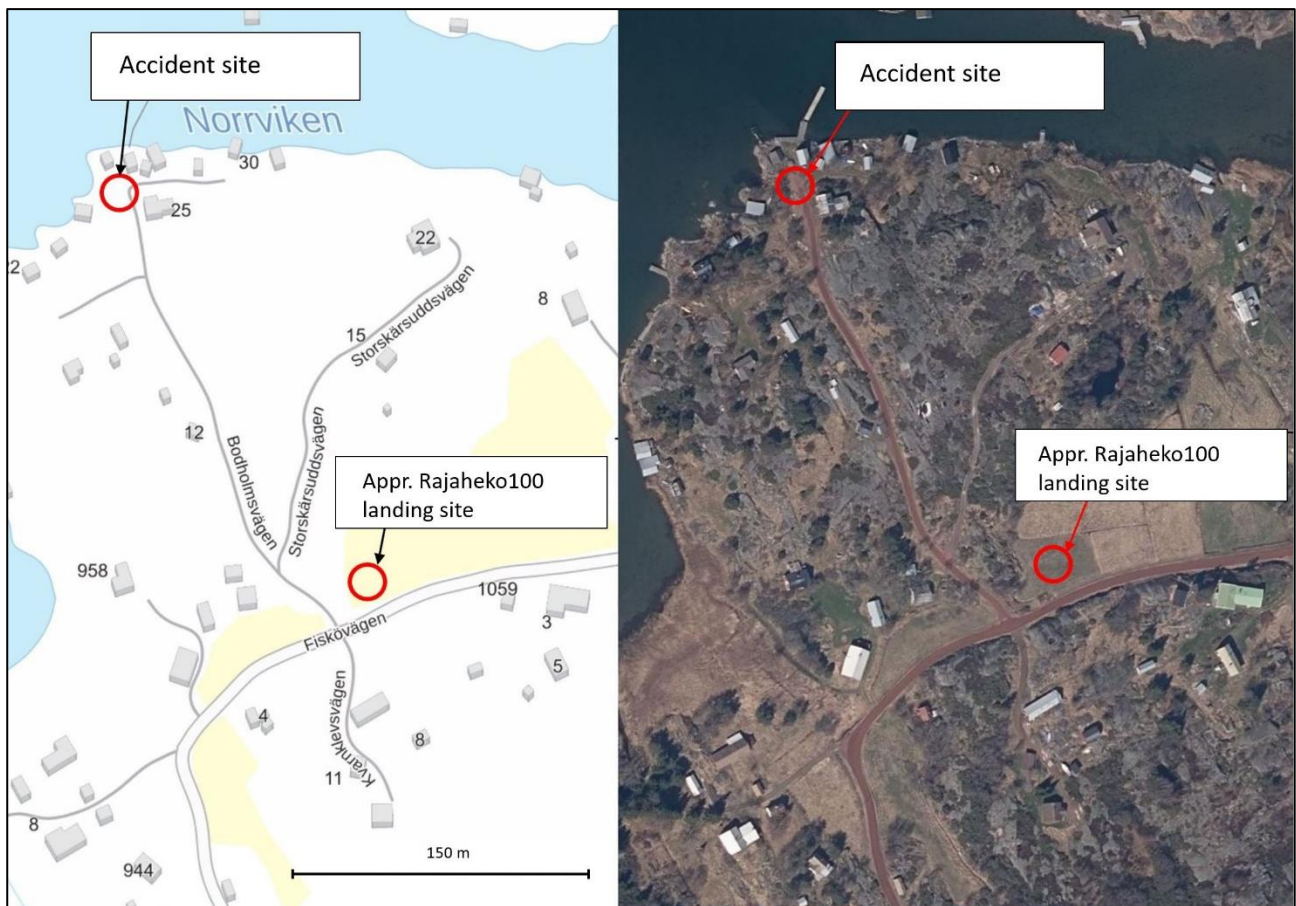




**Kuva 3.** The landing point and danger areas. The 11-meter diameter yellow circle represents the danger area beneath the main rotor disc. The pink outer circle is the 17-meter diameter danger zone around the helicopter. The red arrow indicates slide direction. Prevailing wind was from the direction indicated by the thick blue arrow, variable between the thin blue arrows. The white arrow points to grid north. (Photo: SIAF, taken on February 13)

The crew member went into the house to examine the patient, who was waiting for pick-up. At the same time, people began to congregate on the accident site. On hearing that one of them had background in nursing, the pilot instructed him to help the flight nurse.

After several phone calls it was confirmed that a Border Guard helicopter and a patrol boat were on their way to the accident site. The helicopter landed about 250 m away from the accident site 45 min after the alert. It then took off with the patient and the accident helicopter crew on board and landed at Mariehamn Central Hospital. After the helicopter crew had disembarked, it proceeded to transport the patient to Turku University Hospital.



**Kuva 4.** The accident location and the landing site of the Border Guard helicopter. (Photo: National Land Survey of Finland, annotated by SIAF)

## 1.2 Alerting and Rescue Operations

At 1630 h, the crew member called the PSAP and reported the accident. He told that the flight nurse had sustained back injury and requested transport to a hospital. At 1633 h, the PSAP operator asked the paramedic field commander (call sign MED4) to report to the PSAP.

Also at 1633 h, the operator called the on-duty fire officer (M03), who was in charge of the rescue operation, and reported the accident. At 1637 h, the on-duty fire officer alerted Brändö contract fire brigade (CFB) and asked the operator to request a Border Guard helicopter and a patrol boat to assist in transport. Also at 1637 h, the PSAP notified first the Police and immediately thereafter the Marine Rescue Coordination Center (MRCC) in Turku of the accident, requesting the MRCC to provide transportation assistance. At 1642 h, the operator reported the accident to the Aeronautical Rescue Coordination Center (ARCC)<sup>5</sup> in Helsinki.

The on-duty fire officer directed the operator to put Strandnäs CFB on standby and called the rescue department fire officer, asking him to assume responsibility for routine duties. A rescue unit of Brändö voluntary fire brigade (VFB) arrived on the accident site at approximately 1705 h and was instructed, in addition to fire prevention, to reconnoiter and secure the site. The first response capable operational support unit of Brändö CFB also arrived on scene.

<sup>5</sup> The ARCC manages aerial search and rescue operations and provides support for the security and rescue authorities.



The on-duty fire officer drove to the port of Långnäs to board a Border Guard boat to Fiskö. While under way, he called the Police and learned that a police patrol was returning from a mission on one of the outer islands and was on board a ferry heading for mainland. The fire officer and the police officers decided that the patrol would board the Border Guard boat at Långnäs. At 1717 h, the Police situation center called the PSAP to verify the address of the accident location. The call revealed that two nearly identical addresses existed in Brändö municipality. Police officers had assumed that the accident had occurred on Baggholma Island, even though the actual location was on Fiskö.

It was agreed that Mariehamn Rescue Department unit M111 and paramedic unit M192 would also board the Border Guard boat at Långnäs.

**Taulukko 1.** Alerted units.

Call sign	Alerted	On accident site	Station	Description
MED4	1633	Moved to PSAP	Mariehamn	Paramedic field commander
M03 (on-duty fire officer)	1637	Approx. 1845	Mariehamn	Incident commander
M111	1637	Approx. 1845	Mariehamn	Rescue unit
B11 (Brändö VFB)	1637	Approx. 1705	Brändö	Rescue unit
M192	1637	Approx. 1845	Mariehamn	Paramedic unit
Rajaheko100	1637	1722	Turku	Maritime SAR helicopter
Police	1637	Approx. 1845	Mariehamn	Police patrol
BLS211	1646	Did not arrive	Kökar	Border Guard patrol boat
Strandnäs VFB	1648	On standby	Mariehamn	Rescue unit
BLS103	1649	Approx. 1830	Nauvo	Border Guard coastal patrol boat



(BLS103) at 1646 and 1649 h, respectively. These boats were at sea when they received the alert. A Border Guard airplane (Finnguard08), which was on a maritime patrol mission, was directed to pass situation picture and report on ice conditions in the accident area at 1704 h. Rajaheko100 landed near the junction of Fiskövägen and Bodholmsvägen (figure 4) at 1724 h.

The rescue unit, the paramedic unit and the police patrol boarded BLS211 at Långnäs and set out for the accident site. However, based on ice report from Finnguard08, it was decided to transfer them to nearby BLS103 at the port of Lappo at approximately 1817 h. BLS103 transported the units to Torsholma Island, from where they were driven by taxi to the accident site. The Brändö rescue units were engaged in securing the accident site and were therefore unavailable for transportation.

Rajaheko100 moved the patient and the accident helicopter crew to Mariehamn, where it landed at 1913 h. It then took off with the patient on board and arrived at Turku at 2009 h.

### 1.3 Wreckage and Impact Information



**Kuva 6.** The damaged helicopter and the boat shed. (Photo: Babcock Scandinavian)

The helicopter sustained substantial damage that necessitated costly repairs. The boat shed was damaged. The nurse, who occupied a rear seat, received minor injuries. The accident did not cause fuel or oil leaks.



## 2 BACKGROUND INFORMATION

### 2.1 Environment, Equipment, and Systems

The autonomous region of Åland consists of over 6,700 islands and islets and is home to approximately 30,000 people. The population of the region's municipalities varies considerably. The smallest municipality in terms of population is Sottunga with about 100 inhabitants, while the capital Mariehamn has a population of almost 12,000. Åland receives approximately 2.1<sup>8</sup> million visitors each year. While most of them disembark to stay in the islands, around 25 percent continue on the outbound journey.



**Kuva 7.** Eurocopter EC145 T2. (Photo: SIAF)

#### Accident Aircraft

The EC145 T2 is a twin-engine helicopter currently manufactured by Airbus Helicopters. It can carry 9 passengers and is certified for single or two pilot operation. It can be fitted for search and rescue (SAR), passenger transport and light utility roles and for police operations. In an air ambulance role, the crew consists of a pilot, a helicopter emergency medical service technical crew member (TCM) and a flight nurse or a medical doctor. Stretchers can be installed in the cabin.

The helicopter is powered by two Safran Arriel 2E turboshaft engines, each producing 730 kW (978 hp) at takeoff power. A fenestron type tail rotor is fitted. The helicopter's maximum speed is 240 km/h, and its maximum range is 650 km. Ceiling and rate of climb are 6,600 m and 8.1 m/s, respectively. The fuselage is 11.69 m long, and overall length including the main rotor is 13.64 m. Overall height is 3.95 m. Main rotor diameter is 11 m. The empty mass and

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<sup>8</sup> Before Covid-19 pandemic.

maximum takeoff mass are 1,792 and 3,700 kg, respectively. The tubular metal skids have a smooth surface.

## 2.2 Conditions

**Weather** in the area was dry, and visibility was good. Gusting, occasionally brisk westerly wind was blowing. The automated weather observation system at Mariehamn airport reported 1620 h weather as wind from 250° at 10 kt (5 m/s) variable between southwest and northwest. Visibility was over 10 km, temperature +4 °C, dew point -1 °C and sea-level atmospheric pressure 1,011 hPa.

Weather at 1630 h in the observation facility nearest to the accident site in Kumlinge was wind from 250° at 15 kt (7 m/s). Visibility was over 10 km, temperature +3 °C, dew point -1 °C and sea-level atmospheric pressure 1,010 hPa.

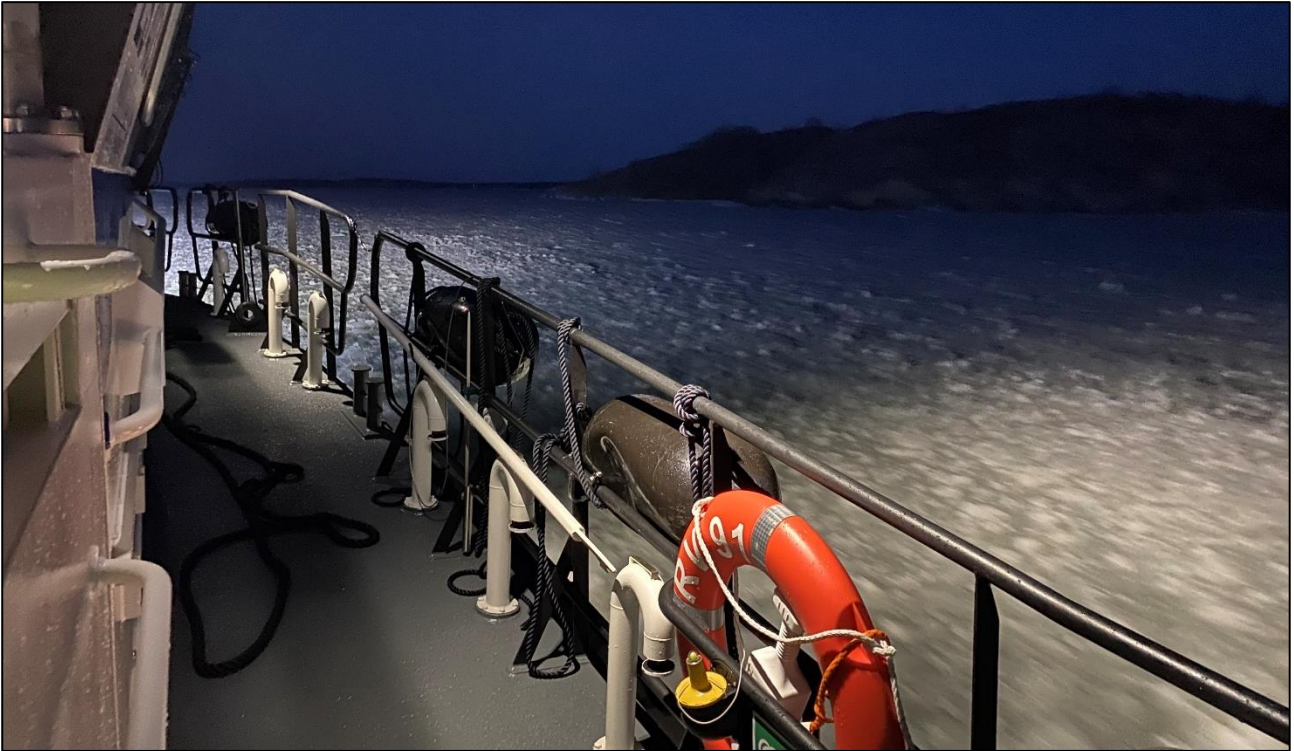
**The landing site** and its surroundings were free of obstacles that could have jeopardized the landing. The crew elected to land in the yard of the house where the patient was waiting for pick-up. Several houses and sheds were located in the vicinity of the landing site, and boat was stored against the wall of a shed on the right-hand side as seen from the direction of landing. Miscellaneous loose objects were scattered on the ground. The partially ice-covered yard sloped slightly to the right and aft as seen from the helicopter during the approach.



**Kuva 8.** The white van is parked on the intended landing point. The helicopter is in its final position with the fuselage almost exactly aligned with the direction of landing. The photo was taken approximately 30 min after the accident. (Photo: Babcock Scandinavian)

**Ice conditions** around nearby islands and islets were such that the units that were on their way to the accident site were transferred from BLS211 to BLS103 due to the latter's better ice-going performance. This was done at the port of Lappo.





**Kuva 9.** Ice conditions as seen from the deck of coastal patrol boat BLS103. (Photo: Mariehamn Rescue Department)

## 2.3 Recordings

The probe into the rescue operation used emergency calls, radio communications and phone calls recorded at the public safety answering point (PSAP) in Mariehamn. They provided information of, among other matters, risk assessment related to the falling accident and to the decision to dispatch the helicopter and helped to reconstruct the flow of the rescue operation.

The helicopter's maneuvers and events during the landing, including intra-crew and radio communications and sounds audible inside the helicopter, were analyzed using data from the onboard CVR<sup>9</sup>. Data from the cockpit video camera was unavailable because the camera's memory card was full and had not been replaced.

The FDR<sup>10</sup> yielded data on the helicopter's motions, direction of flight, rotor speed, flight control positions and acceleration forces.

## 2.4 Personnel, Organizations and Safety Management

**The pilot** held the required licenses and ratings. He had accrued 1,725 h in helicopters, of which 1,330 h were in the accident helicopter make and model. During the 90 and 30 consecutive days he had flown 42 h and 10 h, respectively. He had not flown during the 24 consecutive hours and had had the opportunity for adequate rest.

**The technical crew member** was a Mariehamn Rescue Department employee. He had received helicopter emergency medical service technical crew member (TCM) training and held the required qualifications issued by the rescue department and the helicopter operator.

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<sup>9</sup> Cockpit voice recorder.

<sup>10</sup> Flight data recorder.



**The flight nurse** was an Åland Health Care District<sup>11</sup> employee. She had received the required training and held the required qualifications issued by the health care district and the helicopter operator.

**Babcock Scandinavian AirAmbulance** has operated ambulance helicopters in Åland since 2019. It is part of Babcock International, which provides aviation, marine and security services worldwide for civil and military customers, including search and rescue (SAR) operations in several South European countries. Babcock operates fixed-wing aircraft and helicopters in the air ambulance role also in Sweden and Norway.

The company has a full range of operations, training and safety management manuals required by the regulatory authority. The guidelines governing ambulance helicopter operations are comprehensive, and instructions related to off-airfield landing site and other operations are presented in a clear and unambiguous manner.

The investigation team vetted 31 occurrence reports filed in Babcock in 2016–2020. Six of them involved a snowy or slippery landing site. In one of the occurrences, the helicopter had slid over a distance of a few meters on landing, while in five events slippery ground or snow had caused difficulties during landing. The reports had been processed in accordance with the procedure laid down in the operator's safety management system (SMS).

## 2.5 Preventive Actions of Authorities

**The Swedish Transport Agency (Transportstyrelsen)** is subordinated to the Swedish Government. It exercises oversight of traffic-related licensing, registry and regulatory matters. The corresponding Finnish authority is **the Finnish Transport and Communications Agency Traficom**.

Commercial air transport and related functions are regulated by international agreements, European Union and national regulations and various standards. The prerequisites for granting a license include a well-documented operations management system consisting of a quality management system and an SMS. The performance of these systems is monitored by audits. Monitoring is primarily risk-based, and the premise is that operators have a functional own-check system. An SMS must ensure that the operator can carry out management of change and safety assessment actions when operational changes are under way or pending a deviation from a normal procedure.

Babcock holds an air operator certificate (AOC) issued by Transportstyrelsen. The agency is responsible for the oversight of the operator's activities in Sweden and abroad, including Åland. The last audit performed by Transportstyrelsen at Babcock had been on April 2, 2020. Although Babcock does not hold an AOC issued by Traficom, the two regulators work in cooperation. Therefore, if a need should arise to restrict Babcock's operations in Finland's territory, required actions would be coordinated between Transportstyrelsen and Traficom.

## 2.6 Rescue Services and their Preparedness

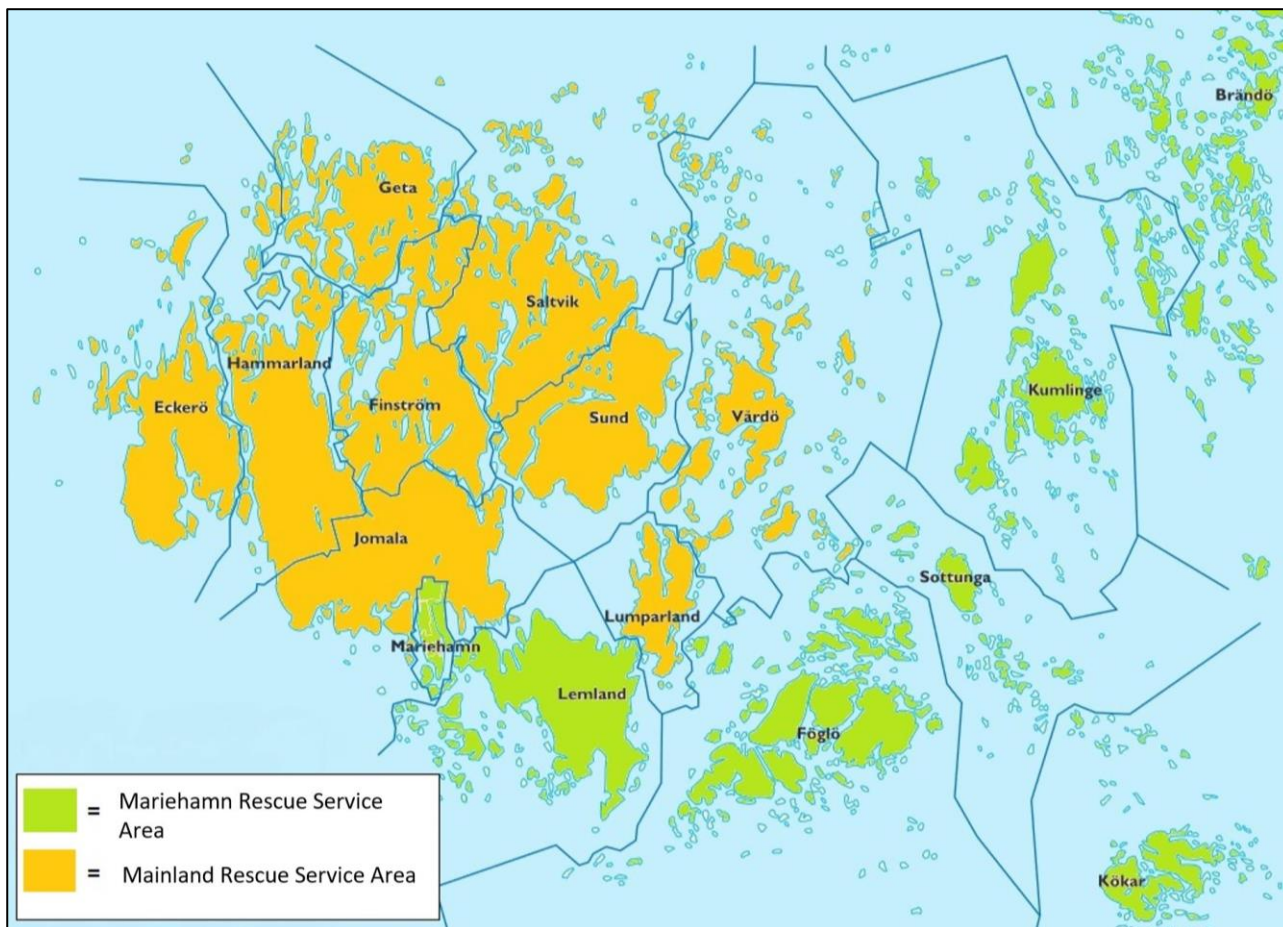
**Rescue services in Åland** are managed by the region's municipalities, which means that, under the Rescue Act for the Region of Åland<sup>12</sup>, each municipality is responsible for the arrangement of rescue services in its area. The Government of Åland exercises overall oversight and direction of rescue services, including the municipalities' preparedness and

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<sup>11</sup> Ålands hälso- och sjukvård.

<sup>12</sup> Räddningslag (2006:106) för landskapet Åland.

rescue service arrangements. Operational rescue tasks and other tasks that belong to rescue authorities, such as licensing and supervisory services, are separated at municipal level.



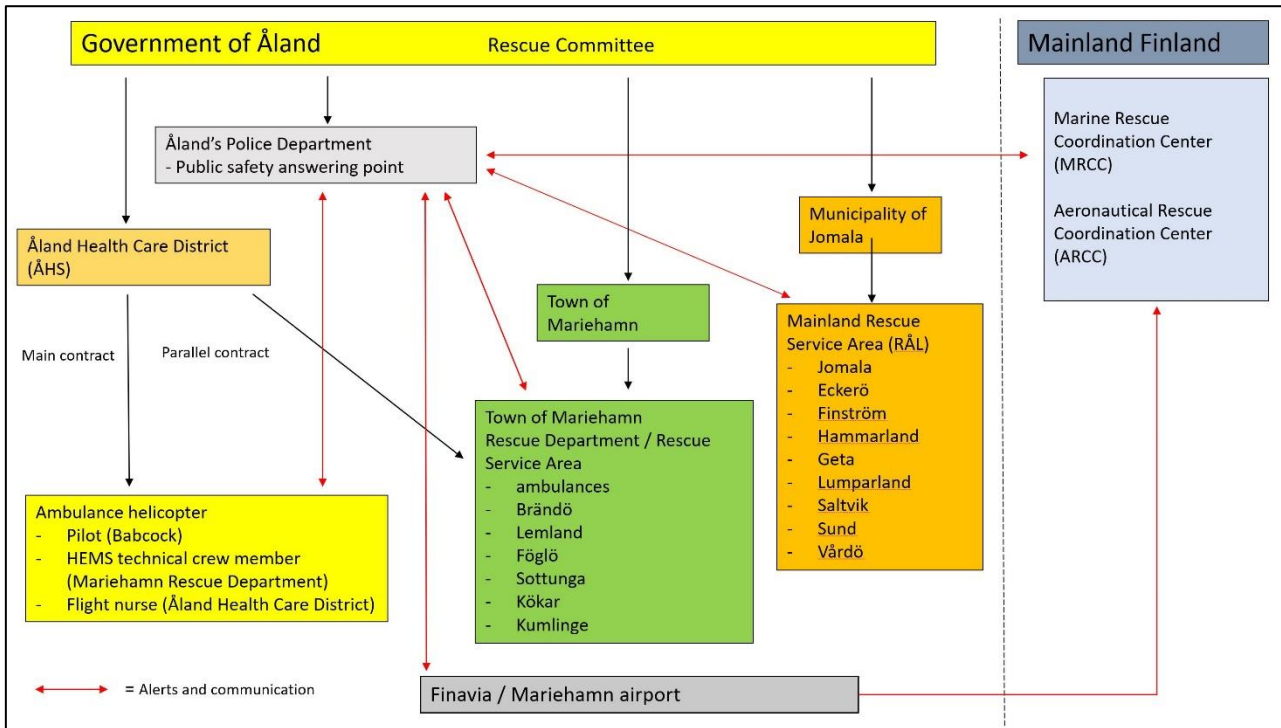
**Kuva 10.** Rescue service areas in Åland. (Map: Maridea Reklambyrå, annotated by SIAF)

Åland is divided into two rescue service areas. The town of Mariehamn, the municipality of Lemland and five outer island municipalities comprise Mariehamn Rescue Service Area. The other area, called Mainland Rescue Service Area, covers the municipality of Jomala and eight mainland and offshore island municipalities. Each municipality has the right to choose which one of these areas it belongs to.

Each area has a senior duty officer. Although the areas can coordinate their actions in a rescue effort, cooperation is not initiated automatically based on risk assessment made, for example, in the PSAP. From this follows that an alert will not be addressed to the nearest suitable unit in the first place. Exceptions are the rescue diver unit and a lifting platform crew attached to Mariehamn Rescue Department, which will be dispatched in accordance with a predetermined incident response procedure. The rescue service area that has requested assistance from the adjoining area will be billed for the services provided.

A rescue committee is integrated in the organization of the Government of Åland under the Rescue Act to support the government in matters related to rescue services and

environmental damage control. Its responsibilities are defined in the Rescue Act for the Region of Åland<sup>13</sup>.



**Kuva 11.** The authorities and emergency response chain for rescue, police and emergency medical services in Åland. (Diagram: SIAF)

The organization of Jomala municipal government includes a joint rescue sub-committee that has a representative from every municipality of Mainland Rescue Service Area, whereas in each municipality of Mariehamn Rescue Service Area matters related to rescue services are delegated to one of the municipality's administrative committees, as a rule to the technical sub-committee.

Rescue services in Åland rely heavily on voluntary contribution. The sole full-time rescue department in Mariehamn is staffed by 1 + 6 persons per shift. It has a rescue diver unit and is supported within the town limits by one contract fire brigade (CFB). In all other 15 municipalities, rescue services are provided by CFBs.

Under the Rescue Act for the Region of Åland, the municipality of Brändö is responsible for rescue services in its area. For this purpose, the municipality has entered into an agreement with Brändö voluntary fire brigade. The municipality relies on Mariehamn Rescue Department for the command of rescue operations and the execution of other official duties.

The investigation revealed deficiencies in instructions governing the preparedness for major accidents and for communication and management arrangements at municipal level. Even though some municipalities have done risk analyses, an overall risk assessment for the region has not been conducted. Because the rescue department does not have suitable vessels for oil pollution control or general rescue service duties, it requests assistance from the Police, Åland's Maritime Search and Rescue Association or the Border Guard as required.

<sup>13</sup> Rådningförordning (2006:111) för landskapet Åland.



**The public safety answering point (PSAP) and situation center** are subordinated to police administration and thence to the Government of Åland. At the time of the accident, the PSAP was located in the Mariehamn fire station, from where it was moved to new facilities in the police station in the spring of 2022 and is now co-located with the police department. When the accident happened, the PSAP was manned by one operator, while one duty officer was present in the desk unit in the police station. The current shift manning of the PSAP is two persons. Duty officers (6 + 6) are police officers and PSAP operators. The PSAP uses the dedicated Åland emergency response center system and determines response levels, except for emergency medical service (EMS) missions, which are handled by Åland Health Care District. Accident response levels are determined based on alert types using an overall approach. The PSAP may start the process of switching to the Erica data system<sup>14</sup>.

Two mobile network operators provide services in Åland. A call made to the emergency number 112 is accompanied by the caller's location information depending on over which one of these networks the call is made and received in the PSAP. However, location information will not be transmitted with calls made over the local operator's network. The Emergency Response Center Agency's 112 Suomi application is not enabled in Åland and the automatic location information function is unavailable. This applies to calls made on both operators' networks. However, the PSAP operator may ask the caller to report his or her location, which is visible to the operator when he or she returns the call made with the 112 Suomi or Swedish SOS Alarm application.

**The Border Guard** is responsible for border security and prevention of environmental damage in open sea. It is the leading SAR authority and organizes maritime SAR operations.

Finland is divided into six Border Guard districts. An Air Patrol Squadron supports the districts by conducting statutory tasks with its fleet of fixed-wing aircraft and helicopters. The squadron's most important tasks are maritime SAR and the surveillance of the land and maritime borders in support of the surveillance operation conducted by the districts. The primary task of maritime patrol missions is environmental control in sea areas.

The squadron has a twin-engined helicopter on 24/7 alert in Turku, Helsinki and Rovaniemi, ready to be dispatched on urgent rescue missions or other tasks in support of cooperating authorities. The squadron flies maritime SAR and other rescue missions daily. Its flying assets support other authorities in SAR, medical transport, wildfire suppression and a range of other tasks.

West Finland Coast Guard District, headquartered in Turku, is responsible for border surveillance and control, SAR operations and prevention of environmental damage in open sea in its area of responsibility. It cooperates with other authorities in a wide variety of tasks including vessel traffic surveillance, combating of cross-border criminal activities, provision of prehospital emergency medical care transportation, maintenance of public order and security, and fishery and hunting patrols. The Marine Rescue Coordination Center (MRCC) is attached to the district headquarters. The district operates 10 coast guard stations and two patrol boats, and its area of operations includes the entire Åland. Two of the coast guard stations are located in Åland, one in Mariehamn and the other in Kökar. A surveillance station, also in Åland, is manned, resources permitting, to monitor and maintain a maritime picture in the sea areas of the Åland Islands.

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<sup>14</sup> Erica (emergency, response, integrated, common, authorities) is a single automated nationwide data system shared by rescue services, the Police, health and social services and Emergency Response Center Agency.

In the event of a major accident in these sea areas, a joint maritime SAR action team is set up if required to cooperate with the MRCC. The team includes representatives from Åland Police Department, Mariehamn Rescue Department, Mainland Rescue Service Area, the Government of Åland, Traficom, an evacuation center, Åland's Maritime Search and Rescue Association and the port of Mariehamn, Långnäs or Eckerö.



**Kuva 12.** On the left, coastal patrol boat 103; on the right, patrol boat BLS111. (Photos: Border Guard)

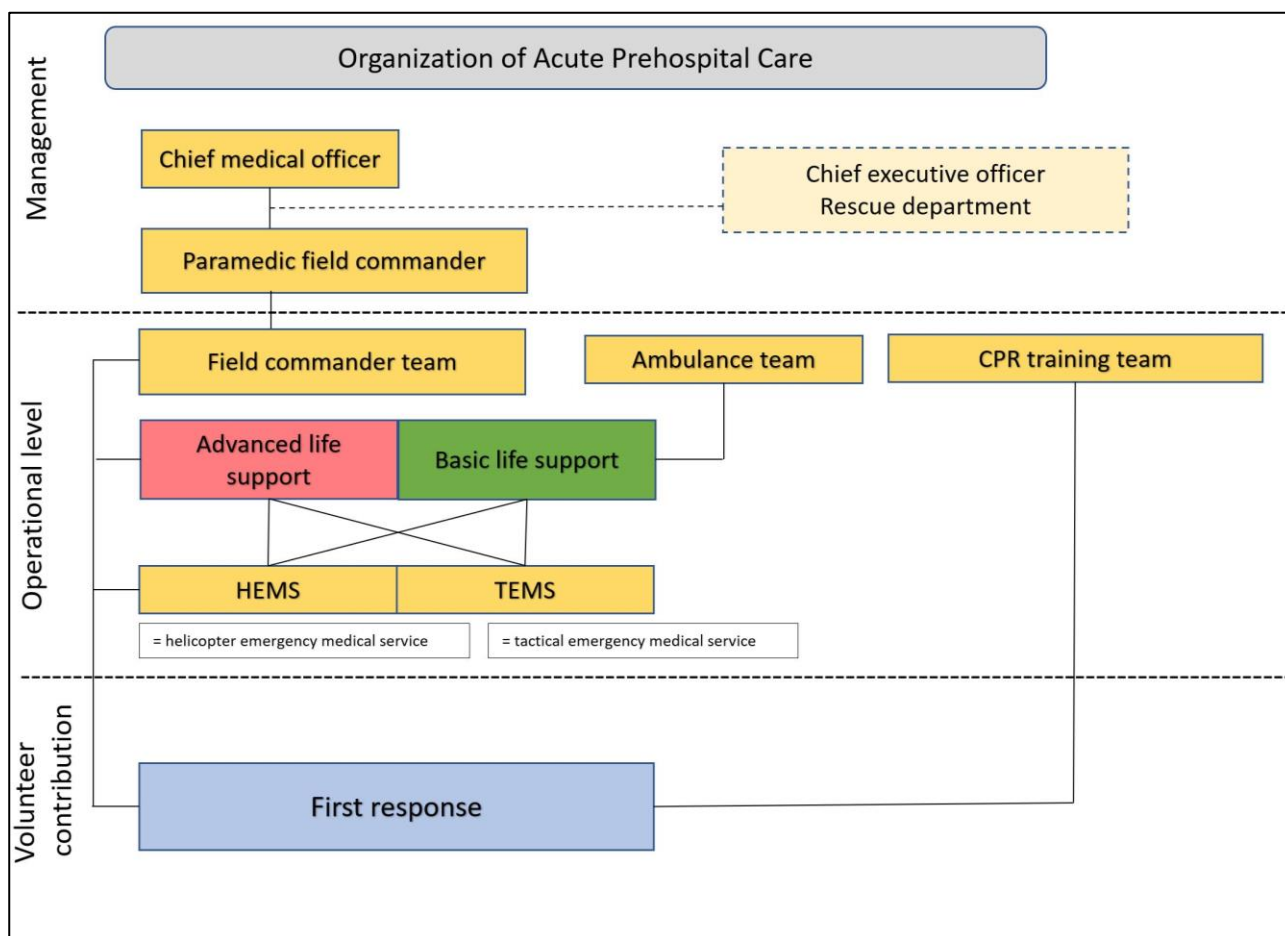
**Åland Health Care District (ÅHS)** provides public health care and medical services in Åland. Mariehamn Central Hospital is a combined health center and the region's main hospital managed by the district's 16 member municipalities. It provides services to the residents of Åland and urgent care to visitors. It has in place a contingency plan for major accidents.

The district plans and develops specialized and primary health care so that they form a functional entity. Health care districts are responsible for prehospital care in their areas. They can provide these services themselves or outsource them to other service providers. Åland Health Care District has outsourced acute prehospital care to Mariehamn Rescue Department. Services are provided on three levels called advanced life support (ALS) level, basic life support (BLS) level and first response level. The district maintains two BLS ambulances in immediate readiness and a third in 15-minute readiness. A paramedic field commander (call sign MED4), who is a district employee, operates on ALS level and exercises command over EMS field operations across Åland. In acute situations, municipalities use the services of local public health nurses and volunteers who have received first response training. The outer island municipalities of Brändö, Kumlinge, Kökar, Föglö and Sottunga have public health nurses who are available on call. Competence requirements for nurses are not harmonized.

Trained first response units are automatically alerted only in cases where the task code is 700A "lifeless" or 711A "airway obstruction". In other cases, the decision is made by the paramedic field commander or, if he or she is unavailable, by the paramedic team leader (MED5).

**Babcock Scandinavian AirAmbulance** provides ambulance helicopter services in Åland under a contract between Babcock and Åland Health Care District. The helicopter crew consists of a pilot, a helicopter emergency medical service technical crew member and an ALS-qualified flight nurse. The paramedic field commander participates in night missions or other missions flown during the off-duty hours of the nursing staff. Crew members are

personnel of Mariehamn Rescue Department. Nurses are employees of Åland Health Care District. All helicopter crew members have received HUET<sup>15</sup> training, and technical crew members have undergone training to cope with pilot incapacitation events.



**Kuva 13.** The organization of acute prehospital care in Åland Health Care District. (Diagram: ÅHS)

Ambulance helicopter operations in Åland differ from those conducted in mainland Finland. A helicopter is frequently used for non-urgent BLS level missions because of the region's location, the dispersion of the population on widely scattered islands and weather and ice conditions. A total of 2,676 EMS missions were conducted in Åland in 2021. A helicopter was involved in 496 of these missions.

**Taulukko 2.** Ambulance helicopter dispatches based on emergency calls and urgency categories in 2021.

Total number	Category A	Category B	Category C	Category D
<b>171</b>	28	75	59	9

Table 2 shows ambulance helicopter dispatches based on calls received via the emergency number 112 in 2021. Of a total of 171 missions, 161 were to the outer island municipalities

<sup>15</sup> Helicopter underwater escape training.



and only ten to the mainland and offshore islands. The number of urgent (categories A and B) and non-urgent (C and D) missions was 103 and 68, respectively. In addition to these, the helicopter flew 325 hospital patient transfer missions in 2021.

Missions are divided into four urgency categories. Category A and B missions require urgent response, while category D missions can be delayed for a predetermined time if necessary. Category C mission patients typically show stable main vital signs, and no immediate and significant further deterioration in the patient's condition is expected. In these cases, medical care units will not emergency-drive to the patient's location or accident site. However, the Decree on Acute Prehospital Care in Åland<sup>16</sup> states that a category C mission patient should be reached with 30 min from the alert.

The Border Guard participated in 37 EMS missions and one rescue mission in Åland in 2021. Eight of the EMS missions involved a helicopter. Three of these were hospital patient transfers.

**Finavia** maintains a regulatory rescue service at Mariehamn airport to respond to aircraft accidents and incidents within the aerodrome area. The aerodrome is in the municipality of Jomala. The service meets the manning and equipment requirements for the applicable firefighting category. The manning of the service and the number of foam tenders are determined for each firefighting category based on the aircraft types that operate to and from an aerodrome at a given time. Mariehamn aerodrome is in category 5, but it can be upgraded to category 7 if required. The service has two foam tenders and operates under the command of the aerodrome maintenance supervisor during emergencies and exercises. The primary task of the service is to save lives in the event of an accident, fire or any other emergency that may occur at the aerodrome or in its vicinity. Finavia has issued an aerodrome emergency plan that details arrangements for regulatory annual exercises.

**The Aeronautical Search and Rescue Coordination Center (ARCC)**, located in Helsinki, is responsible for aerial SAR arrangements in Finland. In this capacity, it cooperates with Fintraffic<sup>17</sup> Air Navigation Services and provides support services to the security and rescue authorities, primarily to the rescue departments, Border Guard and police.

The primary task of the ARCC is to organize and direct air search in order to locate a missing aircraft as soon as possible. The ARCC is in 24/7 readiness to initiate SAR action in cooperation with other authorities. It trains and exercises its staff and participates in annual joint exercises. Traficom issues regulations governing aerial SAR operations and monitors compliance with these regulations.

**Åland Police Department** is responsible for the conduct of police operations in Åland and the execution of police missions under the legislation of the State of Finland and of Åland. The department's facilities are in Mariehamn. Its staff is trained in the Swedish language track in the Police University College in Tampere. Police operations in Åland are at the highest level under the supervision of the Government of Åland, to which the police force is subordinated, and of the Governor, who represents the State police administration.

The department is not an entity of Finland's Police and therefore not under the direction of the Ministry of Interior. It carries out both the statutory duties of the State and tasks assigned by the local administration. Finland's National Bureau of Investigation and the Finnish

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<sup>16</sup> Landskapsförordning (2014:10) om prehospital akutsjukvård.

<sup>17</sup> Fintraffic is a wholly state-owned group that provides traffic control and management services under the ownership steering of the Ministry of Transport and Communications.

Security and Intelligence Service have facilities in the regional administrative agency building in Mariehamn. The National Bureau of Investigation has facilities in Åland.

**Erillisverket Group** is a wholly state-owned company that secures the functions of the society and critical communications. The group provides ICT services for operators that support national security in the fields of critical communications, critical leadership and the protection of critical infrastructure. Its key customers include rescue services, the Police, the Defense Forces, social services and health care providers, Customs, Border Guard and several private companies critical to national emergency supply.

Investigation found that issues had been encountered in radio communications via the public safety network during the rescue operation, and rescuers had on some occasions been forced to revert to the use of GSM phones to ensure smooth continuation of the operation. The matter was investigated in cooperation with Erillisverket, which is responsible for the public safety network. The group was asked to provide a network error log of possible failures and malfunctions between 1630 h and 1930 h on February 12. It was discovered that no reception-related issues or other technical anomalies had occurred in Brändö and surrounding areas during this period.

## 2.7 Rules, Regulations, Guidance and Procedures

The division of legislative powers between the State and Åland is laid down in the Act on the Autonomy of Åland<sup>18</sup>. Autonomy gives Åland a right to pass laws in areas relating to internal affairs and exercise own budgetary power. The Åland Parliament passes laws and supervises the work of the Government of Åland, which is the highest executive body.

Rescue services in Åland are arranged under the legislation of Åland. The Rescue Act and Rescue Decree on Åland<sup>19</sup> state that the Government of Åland has overall responsibility for rescue services in Åland. The municipalities are obliged to maintain operational rescue readiness either alone or in mutual cooperation.

Fire protection may be provided by full-time, partially full-time or contract fire brigades. The municipalities should conduct an assessment of essential accident risks and draw up plans for cooperation with other municipalities and organizations in rescue-related matters.

Statutory tasks of Åland Islands Rescue Department include oil pollution control and support of other authorities in rescue operations as required.

Legislation and guidance governing the management and regulation of ambulance helicopter operations is available, among other documents, in the Government of Åland Decree on Pre-hospital Acute Medical Care<sup>20</sup> (which sets, among other requirements, ambulance response times for each urgency category), general instructions for alerting procedures and operational-level EMS, and in the rescue department's general rules for helicopter operations<sup>21</sup>.

Åland Police Department is subordinated to the Government of Åland. Because legislative and administrative powers are divided under the Act on the Autonomy of Åland, legislation governing police operations is found in acts of both Åland and the State. For example, acts and degrees related to pretrial investigation, compulsion, criminal law, firearms and use of force are derived from State legislation, and rules and regulations issued by the National Police

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<sup>18</sup> 1144/1991.

<sup>19</sup> Rättsföreskrift (2006:106) för landskapet Åland and Rättsföreskrift (2006:111) för landskapet Åland.

<sup>20</sup> Landskapsföreskrift (2014:10) om prehospitäl akutsjukvård.

<sup>21</sup> Helikopterverksamheten allmän information för räddningsverket Mariehamn 2022-02.

Board are applicable also in Åland, whereas matters related to public order, traffic, hunting and the issuance of certain licenses fall under Åland's jurisdiction. The PSAP and situation center are subordinated to the National Police Board.

An agreement between Åland and the State issued as a Decree of the President of the Republic prescribes that Åland Police Department is to assume responsibility for the same statutory tasks as those carried out by mainland Finland police departments.

Babcock Scandinavian AirAmbulance complies in its operations with the provisions of Finnish and Swedish aviation acts and regulations and of the company operations manual.

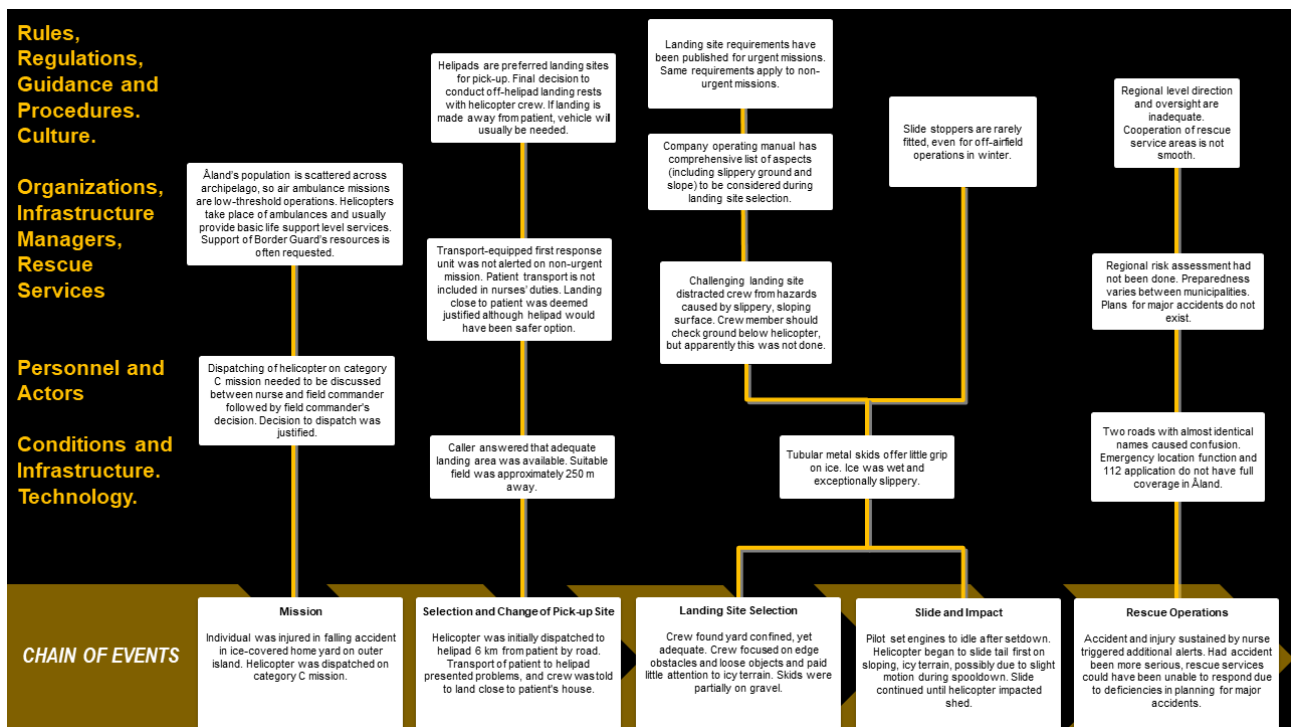
## **2.8 Other Investigations**

Babcock Scandinavian AirAmbulance provided the investigation team with an assessment of damage to the helicopter and of resulting repair costs.



### 3 ANALYSIS

A SIAF-developed format of the AcciMap approach<sup>22</sup> was used to support the analysis of the occurrence. The following text is arranged in accordance with an AcciMap diagram created during the investigation and shown below. The occurrence is depicted as a chain of events along the bottom of the diagram. Contributing factors at various levels can be examined by moving up and down the diagram.



Kuva 14. AcciMap diagram, investigation L2022-01. (Photo: SIAF)

#### 3.1 Mission

A person was injured in a falling accident in the icy home yard on an outer island. After receiving an emergency call, the public safety answering point (PSAP) operator called the public health nurse on a nearby island and the paramedic field commander. In case of an urgent mission, i.e., urgency category A or B paramedic response, the PSAP is authorized to dispatch an ambulance helicopter without first consulting the field commander. This accident was in the non-urgent category C. Therefore, the response needed to be discussed between the PSAP, the nurse and the field commander, who had decision-making authority. After an overall assessment it was decided to dispatch the helicopter.

The decision was justified considering the extended duration of road and ferry transport of the patient to the mainland combined with the patient's experience of pain and a suspected head injury received during the fall.

Because Åland's population is scattered across an extensive archipelago, air ambulance missions are low-threshold operations in which helicopters take the place of wheeled ambulances, usually providing basic life support level services. Helicopter operations in Åland

Rasmussen, J. & Svedung, I. (2000) *Proactive Risk Management in a Dynamic Society*. Karlstad, Sweden. Swedish Rescue Services Agency.

differ from mainland Finland HEMS<sup>23</sup> missions in that their objective is to provide prehospital medical care in acute and life-threatening situations in support of local paramedic services. The primary medical objective is to stabilize the patient for ambulance transport.

In adverse weather, or if the helicopter is needed for simultaneous paramedic missions, Border Guard helicopters can be called to provide assistance. Further support in rescue and other paramedic missions is available in the form of vessels operated by Border Guard and Åland's Maritime Search and Rescue Association. Municipal rescue services do not have suitable vessels for demanding rescue operations. The resulting heavy reliance on Border Guard or the association's resources may create vulnerabilities and lead to a situation where these assets are unavailable when they would be needed.

### **3.2 Selection and Change of Pick-up Site**

The helicopter crew was initially instructed to land on a helipad 6 km from the patient's location by road. This helipad would have been much better suited for landing than the yard where the accident occurred. The PSAP operator inquired the caller who reported the accident whether adequate landing area was available on the accident site, and the caller answered in the affirmative. Layman's understanding of landing site conditions and restrictions is by necessity based on a broad estimate, not on accurate technical data. An open field about 250 m from the yard would have offered a better landing area.

Because ground transport of the patient to the helipad presented problems, the crew was instructed to land close to the patient's house. Neither the municipal first response unit, which was equipped for transport, nor a rescue unit was alerted because the accident was classified as a non-urgent category C occurrence, and procedures state that first response units are automatically alerted to respond only to specific category A missions. Moreover, patient transport is not included in the duties of public health nurses. Because ground transport was unavailable, landing near the patient's house was deemed justified, even though the helipad would have been a safer option.

Purpose-built helipads are preferred landing sites for patient pick-up. The final decision to conduct an off-helipad landing rests with the helicopter crew. If the landing is made well away from the patient's location, a vehicle will be needed to transport the patient to the helicopter.

### **3.3 Landing Site Selection**

The crew found the yard confined yet meeting the published landing site criteria. Because the crew members focused on obstacles bordering the landing site and on loose objects during landing, they paid little attention to the fact that the terrain was covered with ice.

The challenging landing site distracted them from the hazards caused by the slippery, sloping surface. The technical crew member's duties include checking the ground below, but apparently this was not done, or the crew member devoted most of his attention to edge obstacles. The helicopter set down with the skis only partially on gravel. The company operating manual contains a comprehensive list of aspects that should be considered during landing site selection. These include slippery ground and sloping terrain.

Published minimum requirements for HEMS operations may steer decision-making in landing site selection, although a landing site offering the best overall safety should be selected based on risk assessment.

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<sup>23</sup> Helicopter emergency medical service.

### 3.4 Slide and Impact

Almost immediately after the pilot had set the engines to idle upon setdown, the helicopter started sliding tail first on the sloping ice-covered surface. The slide was possibly induced by a slight motion of the helicopter to the left when the engines began to spool down. The slide continued until the helicopter impacted a shed.

The tubular metal skids offered little grip on wet, exceptionally slippery ice. The shape and smooth surface of skids enable the helicopter to slide over a slippery surface. This characteristic is useful on an autorotative landing<sup>24</sup> and under some other circumstances. Slide stoppers are rarely fitted to skids, even for off-airfield operations in winter.

### 3.5 Rescue Operations

The accident and injury sustained by the flight nurse triggered additional alerts. Had the accident been more serious, rescue services could have been unable to respond to the occurrence due to deficiencies in planning for major accidents. Åland Health Care District has alerting and other required procedures for daily operations and instructions for paramedic operations in the event of a major accident.

The investigation revealed that no comprehensive regional risk assessment for rescue services has been done. Because municipalities are responsible for rescue arrangements, the level of preparedness varies between municipalities, few of which have drawn up contingency plans for major accidents. Suitable vessels are not available for oil pollution control, which is among the responsibilities of the Government of Åland.

The Government of Åland is under the law responsible for the overall direction and oversight of rescue services. This function has been executed in a less than adequate manner, and the situation is exacerbated by the lack of overall coordination. The government has allocated insufficient resources for the actual direction and oversight effort, which is exercised by a single public official as a secondary task. Work conducted by a rescue committee integrated in the organization of the government has been only partially effective, and the committee has not held regular meetings. Cooperation between the region's rescue services has not been smooth due to the division of Åland into two rescue service areas and because of challenges in the arrangement of the services that stem from the municipality-based solution.

One of the primary objectives of rescue services is to guarantee people's safety and the availability of the nearest suitable rescue unit in the event of an accident. This ensures the expeditious arrival of assistance on the accident site. The division into two rescue service areas may result in a scenario where the primary goals are not attained.

Two roads with almost identical names are located in the municipality of Brändö, which caused confusion at first. A similar case may delay emergency response and jeopardize the condition of the person who requires assistance.

Two network operators provide mobile services in Åland. When a person calls the emergency number 112, the call is accompanied by his or her location information depending on over which one of these networks the call is made and received in the PSAP. If a call made over the local operator's network, location information will not be transmitted. Location information improves the caller's chances to receive assistance.

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<sup>24</sup> Autorotation is a condition where the engine is disengaged from the main rotor system and the rotor blades are driven by the flow of air through the rotor. It enables a controlled landing after an engine failure or in a similar contingency.



The Emergency Response Center Agency's 112 Suomi application does not have a full coverage in Åland. Because the caller's location information is not transmitted direct to the PSAP, the operator must notify the caller of his or her location, regardless of the network over which the call is made. The lack of the emergency location function may be a result of a cost-saving effort.

The lack of the function jeopardizes the caller's safety and may prevent or at least delay the arrival of expeditious and sufficient help on the accident site. Åland receives a large number of visitors each year. Reporting an address in an emergency call may prove difficult, if not impossible, to a visitor in an emergency. Transmission of location information during emergency calls or the use of the application would significantly improve the rescue services' ability to reach patients across the region.

## 4 CONCLUSIONS

Conclusions encompass the causes of an accident or a serious incident. Cause means the different factors leading to an occurrence as well as relevant direct and indirect circumstances.

1. The decision to dispatch the ambulance helicopter was justified considering the extended duration of road and ferry transport of the patient to the mainland combined with the patient's experience of pain and a suspected head injury received during the fall.

**Conclusion:** *A transport mode that offers the lowest total costs and causes least additional harm to the patient is often selected.*

2. Because Åland's population is scattered across an extensive archipelago, air ambulance missions are low-threshold operations in which helicopters take the place of wheeled ambulances, usually providing basic life support level services.

**Conclusion:** *Ambulance helicopter operations in Åland differ from mainland Finland helicopter emergency medical service missions and are an element of the prehospital medical care pathway.*

3. The authorities in Åland rely on assistance from Border Guard and Åland's Maritime Search and Rescue Association in rescue and paramedic missions. Municipal rescue services do not have suitable vessels for demanding rescue operations.

**Conclusion:** *Heavy reliance on Border Guard or Åland's Maritime Search and Rescue Association's resources may jeopardize rescue operations because these assets may be unavailable to other authorities when simultaneous missions are ongoing.*

4. The helipad would have been better suited for landing than the yard where the accident occurred. An open field approximately 250 m from the yard would have offered a suitable landing area. Information received from the caller of a suitable landing site close to the patient's location steered the crew's decision-making.

**Conclusion:** *A caller's understanding of landing site conditions and restrictions is based on layman's estimate, not on accurate technical data. The final decision on a landing site rests with the helicopter crew.*

5. Ground transport of the patient to the helipad presented problems. Neither the island's first response unit, which was equipped for transport, nor a rescue unit was alerted automatically on the non-urgent category C mission. Patient transport is not included in the duties of public health nurses. The helicopter crew was instructed to land close to the patient's house. This was deemed justified even though the helipad would have been a safer option.

**Conclusion:** *Because the mission was not urgent, preparations were not made for the patient's transport to the helipad or the nearby open field.*

6. The landing site was confined and challenging. The crew found it adequate for landing, but because the crew members focused on obstacles bordering the site and on loose objects, they did not recognize the hazards caused by the slippery, sloping surface. The helicopter set down with the skis only partially on gravel.

**Conclusion:** *The crew members focused on a challenging confined-area landing, which distracted them from noting the slippery surface of the landing site.*

7. Published minimum requirements for helicopter emergency medical service operations may steer decision-making in landing site selection.

**Conclusion:** *A landing site offering the best overall safety should be selected based on risk assessment.*

8. Ice on the ground was wet and exceptionally slippery. The slide continued until the helicopter impacted a shed. The shape and smooth surface of skids enable the helicopter to slide over a slippery surface. Slide stoppers are rarely fitted to skids, even for off-airfield operations in winter.

**Conclusion:** *Fitting slide stoppers on skids would reduce the possibility of sliding during winter operations on slippery surfaces.*

9. No comprehensive regional risk assessment for rescue services has been done. The level of preparedness varies between municipalities, few of which have drawn up contingency plans for major accidents. The overall coordination of rescue services has been executed in a less than adequate manner and lacks direction and oversight at regional level.

**Conclusion:** *The Government of Åland is under the law responsible for the overall direction and oversight of rescue services, but this function has not been executed fully.*

10. One of the primary objectives of rescue services is to guarantee people's safety under all circumstances and the availability of the nearest suitable rescue unit in the event of an accident. This ensures the expeditious arrival of assistance on the accident site. Cooperation between rescue services is not completely smooth due to the division of Åland into two rescue service areas and because of challenges in the arrangement of the services that stem from the municipality-based solution.

**Conclusion:** *The division of Åland into separate rescue service areas may result in a scenario where expeditious and appropriate assistance cannot always be delivered.*

11. Two roads with almost identical names are located in the municipality of Brändö, which caused confusion.

**Conclusion:** *The existence of two nearly identical addresses in the same municipality may cause confusion and delay the launch of rescue actions.*

12. The emergency location function is not enabled in the network of one of the two operators that provide mobile services in Åland. If a call made over the local operator's network, location information will not be transmitted to the public safety answering point operator.

**Conclusion:** *The lack of the emergency location function jeopardizes the caller's safety and may prevent or at least delay the arrival of expeditious and sufficient help on the accident site. Transmission of location information during emergency calls would improve the delivery of expeditious and appropriate assistance significantly.*

13. The Emergency Response Center Agency's 112 Suomi application does not have a coverage in Åland. Because the caller's location information is not transmitted direct to the public safety answering point, the operator must notify the caller of his or her location as displayed by the application.

**Conclusion:** *Åland receives a large number of visitors each year. Reporting an address in an emergency call may prove difficult, if not impossible.*



## 5 SAFETY RECOMMENDATIONS

### 5.1 Use of Support Units in Emergency Medical Service Operations

Ground transport of the patient to the helipad presented problems. Transport to helipads or prepared helicopter landing sites may be required during non-urgent emergency medical service operations in an archipelago. Neither the island's first response unit, which was equipped for transport, nor a rescue unit was alerted because the criteria for task code 700A or 711A were not met. Patient transport is not included in the duties of public health nurses.

The Safety Investigation Authority Finland recommends that

*Åland Health Care District cooperates with Babcock Scandinavian AirAmbulance, public safety answering point and municipal rescue services to expand the instructions for the use of first response units to support non-urgent helicopter emergency medical service operations in the archipelago. [2023-S1]*

The use of an operational support unit should be given particular consideration in situations where patient transport to a helipad or a prepared helicopter landing site cannot be arranged in any other manner. This would also ensure the arrival of assistance should the helicopter be prevented from landing or reassigned on a more urgent mission.

### 5.2 Fitting of Slide Stoppers on Helicopter Landing Skids

The helicopter landed on a partially ice-covered yard. The crew members focused on other risks associated with a challenging confined-area landing, which distracted them from noting the slippery surface. The helicopter set down with the skids only partially on gravel. The icy surface combined with the setting of the engines to idle created a situation where the helicopter started sliding tail first and hit the boat shed.

The Safety Investigation Authority Finland recommends that

*the European Aviation Safety Agency (EASA) informs helicopter operators of a need to fit slide stoppers on the landing skids for operations in winter and under slippery conditions. [2023-S2]*

Occurrence reports reveal several close calls attributed to slippery surfaces between 2016 and 2020. Many entities operate helicopters in winter. Fitting slide stoppers on skids would reduce the possibility of uncontrolled sliding.

### 5.3 Preparedness and Arrangements of Regional Rescue Services

Investigation revealed that no comprehensive regional risk assessment for rescue services has been done. The level of preparedness varies between municipalities because of the municipality-based arrangement. Few municipalities have drawn up contingency plans for major accidents. The overall coordination of rescue services has been executed in a less than adequate manner and lacks direction and oversight at regional level.

The Safety Investigation Authority Finland recommends that

*the Government of Åland takes action to ensure the implementation of statutory direction and oversight functions in order to ensure preparedness for major accidents at municipal level and to ensure the smooth conduct of rescue operations between the two rescue service areas considering the needs of persons residing in or visiting Åland in the event of accidents. [2023-S3]*

The Government of Åland is under the law responsible for the overall direction and oversight of rescue services in the region, for which purpose it should allocate sufficient resources. The division of Åland into two rescue service areas may lead to situations where a person is deprived of assistance from the nearest suitable rescue unit.

#### **5.4 Location Information in Emergency Calls and Availability of 112 Suomi Application**

The Emergency Response Center Agency's 112 Suomi application is not enabled in the network of one of the two mobile operators that provide mobile services in Åland. Neither does the application transmit location information to the public safety answering point.

The Safety Investigation Authority Finland recommends that

*the Government of Åland takes action to ensure that location information is transmitted in emergency calls and the 112 Suomi application is enabled across Åland. [2023-S4]*

The existence of two nearly identical addresses in the same municipality may cause confusion and delay the launch of rescue actions. Expeditious location is conducive to providing the best possible assistance to people in distress, both Åland residents and visitors.

#### **5.5 Implemented Measures**

Babcock Scandinavian AirAmbulance has decided to fit slide stoppers to all skid landing gear - equipped helicopters during the fall of 2022.

The Government of Åland and the Ministry of Interior are looking at solutions to integrate the nationwide Erica and Åland's local Åalarm emergency response center data systems.

Investigation is underway for enabling a non operator-dependent emergency location function in Åland during 2023.

## **REFERENCES**

### **Investigation Material**

- 1) Photographs and other material from on-site investigation.
- 2) Weather data
- 3) Interviews
- 4) Public safety access point recordings
- 5) Decrees of the Åland Government
- 6) Documents of Babcock Scandinavian AirAmbulance
- 7) Cockpit voice recorder and flight data recorder data from accident helicopter
- 8) Material from Finnish Border Guard
- 9) Material from Mariehamn Rescue Department
- 10) Material from Åland Health Care District and paramedic units
- 11) Material from Åland Police Department
- 12) Documents from Eurocopter



## SUMMARY OF COMMENTS TO DRAFT FINAL REPORT

The draft final report was submitted for comments to the Government of Åland, Åland Police Department, Mariehamn Rescue Department, Åland Health Care District, Border Guard, Babcock Scandinavian AirAmbulance, European Aviation Safety Agency, Bureau of Enquiry and Analysis for Civil Aviation Safety of France, Swedish Accident Investigation Authority and Finnish Transport and Communications Agency.

**The Government of Åland** states that, under the division of powers laid down in the Act on the Autonomy of Åland, the Safety Investigation Authority of Finland (SIAF) is not a competent authority to conduct a probe into the rescue authorities of Åland or the Government of Åland. Those parts of the report that are related to the Government of Åland should be amended in order to prevent the SIAF from exceeding its powers. Similarly, investigation into the organization of the fire and rescue authorities falls under the jurisdiction of the Government of Åland and was outside the scope of the request for assistance submitted by the government.

**Åland Police Department** corrected a number of terms and clarified possible causes of ambiguity found in the report. The statement also described development projects initiated between the Government of Åland and the Ministry of the Interior. Furthermore, the statement emphasized the powers of the Government of Åland in matters regarding the Åland Islands public safety answering point, more specifically the fact that the Emergency Response Center Agency's 112 Suomi application is not enabled in Åland.

**The Border Guard** clarified the descriptions of the duties and responsibilities of the agency's units, unit designators and their form.

**Babcock Scandinavian AirAmbulance** submitted amendments to the technical data of the helicopter and to the pilot's work history.

**The European Aviation Safety Agency (EASA)** stressed that the helicopter manufacturer had already certified an optional slide prevention kit which has been available for fitting on the helicopter provided it has been included in the order. Neither does EASA consider the safety recommendation regarding the slide stoppers relevant because it has no bearing on the root cause of the accident and lacks sufficient details. EASA sees the recommendation as too generic and does not recognize any related explicit design architecture. EASA maintains that the current regulatory framework requires an air operator to ensure that its aircraft are in a proper configuration and the crews hold the necessary qualifications for operations in each area and for each mode of operation. Operators should also conduct applicable safety risk assessments in accordance with requirements laid down in their management system documentation. EASA concluded that the safety recommendation as such would not generate additional safety value that would bolster the existing requirements.

**The Swedish Accident Investigation Authority (SHK)** requested that the participation of the agency's representative in the investigation be added in the foreword.

**The French Air Safety Investigation Authority (BEA)** had no comment on the report.