Investigation report

Investigation of SAR-helicopter safety in Equinor after the helicopter accident 28 February 2024

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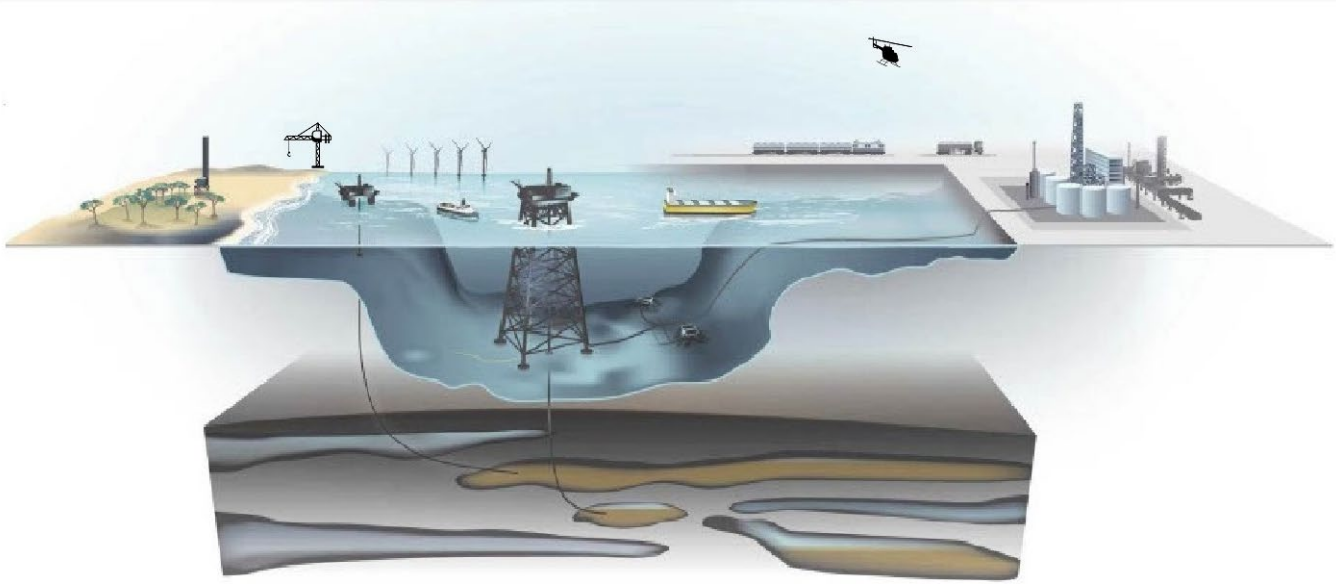

The purpose of investigations is to prevent incidents and accidents

Revision	Date	Status
01	07.06.2024	Draft for hearing
02	24.06.2024	Final – released
03	27.06.2024	Translated copy of Final -released report

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Released by the Commissioning entity:

Anders Opedal (sign.)	CEO	Equinor	Date

Content

1 Summary

This is a translation of the final, released investigation report on SAR helicopter safety in Equinor after the helicopter accident 28 February 2024. This version is not signed, and in the event of any discrepancy, the Norwegian version will prevail.

During an exercise with a Search and Rescue helicopter (SAR), this crashed in the sea west of Sotra on 28.02.2024. The accident led to the death of the SAR nurse, one of a crew of a total of six people.

On 11.03.2024, Equinor's CEO signed a mandate for an investigation into the helicopter accident. The purpose was to ensure lessons learned from the incident and to identify measures to improve the company's work on SAR helicopter safety on the Norwegian continental shelf, with a particular focus on accident response.

The Norwegian Safety Investigation Authority (NSIA) is responsible for finding the cause of the accident. Equinor's investigation team will therefore not assess the course of events and causal factors for the accident. So far, as of 19.06.2024, according to updates on its own website, the NSIA has "*not made any unequivocal findings that are believed to affect immediate flight safety*". (**Ref /44/**)

In addition to the introduction and summary of the main conclusions, this investigation report is divided into the following main chapters:

Chapter 2 describes the mandate and how the investigation work has been carried out.

Chapter 3 contains factual information about Equinor's organisation, internal and external emergency response resources, as well as technical information about equipment in helicopters and personal protective equipment for both crew in SAR helicopters and passengers in the delivery service.

Chapter 4 describes the procurement process in Equinor related to SAR helicopter contracts awarded in 2022.

Chapter 5 contains the actual sequence of events with the rescue operation and Equinor's emergency management.

Chapter 6 describes the NSIA's ongoing work to find the causes of the accident.

Chapter 7 looks at the Turøy accident in 2016 and Equinor's follow-up of measures from the investigation report.

Chapter 8 shows the investigation team's assessments of the possible consequences of the accident.

Chapter 9 provides background and explanations of the investigation group's proposed measures.

Furthermore, there are ten appendices, all of which have references from the main report.

1.1 Main conclusions

SAR helicopters are described in Equinor's requirements and procedures for helicopter traffic, in the Norwegian Ocean Industry Authority's (Havtil's) annual report on the risk level in the Norwegian petroleum industry, and in SINTEF's safety studies on helicopters. However, it is only seen as a means of reducing the risk of transporting offshore workers between land and the installations, called the "transport service". The actual risks of flying SAR helicopters are not specifically mentioned.

SAR helicopters carrying out rescue missions, such as searching for people at sea or using a lift to hoist people to or from the sea or vessel, will also operate at low altitude. Low flight altitude will give pilots relatively little time to react to challenges. Similar conditions will apply when SAR helicopters are on exercise missions.

Because of the increased risk this entails, it is even more important that the entire SAR crew has good, detailed procedures for how both real missions and exercises are to be carried out, that they are equipped with good personal protective equipment and that they are well trained to handle emergencies and evacuation. To investigate the SAR nurses' perceptions related to this, all SAR nurses in Equinor have been invited to respond to a comprehensive survey.

Based on this investigation, the investigation team has several recommendations for improving SAR helicopter safety. This includes recommendations related to:

- Clearer procedures for when the SAR crew must unfasten the seat belt
- Review of the personal protective equipment for SAR crew
- Reintroduce more frequent pool workouts (including helicopter rollovers)
- Use of the same protective equipment during pool training as that used in the helicopter
- More realistic pool workouts

Since it has not been part of the mandate, nor has it been possible to investigate the causes of the incident, the investigation team is clear that the recommended measures do not provide a basis for drawing conclusions as to whether these have had an impact on the cause or outcome of the incident.

Although it was the Joint Rescue Coordination Centre that managed and carried out the rescue operation in connection with the SAR accident, the investigation team has found a need for some improvements related to Equinor's emergency response.

After a review of the follow-up of measures following the investigation of the Turøy accident that occurred in 2016, the investigation group believes there is a need for a new verification of recommended measures. This must be done both to ensure that the measures have had the desired effect, and that the effect is still present, eight years after the accident.

The investigation team is of the opinion that the procurement process for the award of the current SAR contracts has taken place in accordance with the current management system and in a satisfactory manner, but that the timeline for process and start-up of the contract were perceived as tight.

2 The investigation work

The purpose of this investigation, in the aftermath of the incident, is to put forward recommendations for learning and improvement. The investigation team has not made any assessment of civil or criminal guilt and responsibility. The use of this report for anything other than preventive safety work must be avoided. The investigation team is clear that the findings and recommended measures do not provide a basis for drawing conclusions as to whether these have had an impact on the cause and outcome of the incident.

The final, released report has been translated into English (this report). This translated version is not signed, and in the event of any discrepancy, the Norwegian version will prevail.

A joint investigation team is behind the content of the report.

2.1 Mandate

The mandate of the investigation group has been to conduct a review of the following matters:

- Equinor's organisation and activities related to SAR helicopter services
- Equinor's handling of notification and emergency response in connection with the incident, including:
  - Interaction with authorities and partners
  - Business continuity
- Equinor's follow-up of recommendations and measures following the helicopter accident on Turøy in 2016

Based on the investigation work, the investigation team will provide its observations, including related to learning, and recommend measures to strengthen Equinor's work on SAR helicopter safety and accident response.

A translation of the mandate for the investigation is shown in its entirety in **App A**.

2.2 Uncertainties and limitations

According to the mandate, the investigation team is not to map causal factors for the accident, as this is within the task of the public investigation commission the Norwegian Safety Investigation Authority, Aviation (NSIA). As the Civil Aviation Authority writes (*translated*):

> *The purpose of NSIA's investigations is to investigate conditions that are assumed to be important for the prevention of transport accidents* (**Ref /59/**).

Causal factors are also being investigated through an investigation conducted by the helicopter operator Bristow. Equinor participates with an observer in this investigation group. Equinor's investigation team has not had access to the work of this group.

Because Equinor's investigation team will not investigate the incident with the SAR helicopter itself, there has been no contact with the crews of the accident helicopter or the rescue helicopters that participated directly in the rescue operation. This has been done so as not to be coloured by possible causes of the accident.

2.3 Competence

An investigation was decided on 01.03.2024, and the investigation group was established on 11.03.2024. Overall, the investigation group covers aviation and helicopter safety, legal expertise, communication expertise, trade union work and safety delegates. The head of the investigation and the co-investigator have investigative expertise.

Each member of the investigation team is described in **App B**.

2.4 Investigation methodology

The investigation work was carried out based on Equinor's investigation process as described in *ARIS INV 101*. The mandate for the investigation was signed on 11.03.2024, and the investigation group had their first meeting on 14.03.2024.

The wording of the mandate is somewhat different from that of a traditional accident investigation in Equinor since the investigation team will not map the causes of the accident. The investigation work documented in this report has been carried out in line with the principles in Equinor's governing documentation for accident investigations, adapted to the mandate.

A week after the signed mandate, information was posted on Equinor's internal website "Insight" that an investigation had been initiated. Here, the delimitation of the work was also pointed out:

> *"Equinor has initiated an internal investigation into the helicopter accident on February 28th. The goal is to learn from the incident and identify measures that can strengthen the company's work with SAR helicopter safety. The NSIA is examining the actual course of events and the causal factors of the accident. These are not issues that Equinor's internal investigation team will consider.*
>
> *Equinor's investigation is intended to complement the picture uncovered through the NSIA, seen from Equinor's perspective. The helicopter company Bristow will also investigate the accident, with Equinor participating as an observer. In addition, the police are investigating the incident.*
>
> *The investigation team plans to complete the report with recommendations and observations by mid-June 2024."*

Throughout its work, the investigation team has had weekly status meetings with a contact person for the commissioning entity, Ståle Endre Berg (Senior Vice President, Safety). The heads of the three offshore associations in Equinor; Per Steinar Stamnes (Industri Energi), Per Helge Ødegård (Lederne) and Porfirio Esquivel (SAFE), as well as Baste Daltveit, coordinating main safety delegate for EPN (Norwegian continental shelf), participated in every second of these meetings, but received a written summary of all meetings. The head of the investigation and the commissioning entity's contact person have also had two meetings with the commissioning entity's representative, Jannicke Nilsson (Executive Vice President, SSU – safety, security and sustainability).

Prior to the hearing, the head of the investigation held an information meeting with the commissioning entity, CEO Anders Opedal, the executive vice presidents for legal, Siv Helen Rygh Torstensen, security, security and sustainability, Jannicke Nilsson, and communications, Jannik Lindbæk, as well as security director Ståle Endre Berg and head of corporate audit, Bent Rune Solheim.

2.5 Meetings

The investigation team has conducted 30 conversations and meetings with a total of 50 people. These have had various positions in:

- emergency response
- next of kin management
- communication
- normalisation work afterwards
- contracts
- flight safety
- air logistics
- health care

The investigation team has requested and received logs from various groups within emergency response and follow-up. This includes self-evaluations that these groups have carried out afterwards. The investigation team has been given access to supporting material such as the tender strategy for new SAR helicopter contracts, tender documentation, tenders received, risk assessments made for the tenders, draft contracts, as well as the final contracts.

In the aftermath of the accident, the investigation team has sent out an anonymous survey with 59 questions to all SAR nurses, both permanent employees (24) and hired workers (6). Of the permanent employees, 21 responses have been received, while only one response has been received from the hired nurses. The low response rate among the hired personnel may be because they might not have been at work during the weeks the survey was ongoing. There may also be problems with data access to submit answers, even if everyone has an Equinor email.

Parts of the investigation team have had meetings with the next of kin of the deceased SAR nurse.

In addition to internal employees, the investigation team has had meetings with the following external parties:

- management of Bristow in Norway
- Bristow's chief technician and SAR crew at Flesland
- Norwegian Safety Investigation Authority, Aviation (NSIA)
- Joint Rescue Coordination Centre (JRCC), Southern Norway
- Air Force Rescue Squadron 330 at Sola
- lead author of the Helicopter Safety Study, SINTEF

The helicopter companies Bristow and CHC have responded to an extensive list of questions from the investigation team.

On 08.04.2024, the investigation team had a meeting with the NSIA at Navy base Haakonsvern outside Bergen and was able to view the crashed SAR helicopter. Present were the head of the NSIA investigation and the assistant head of the investigation. Bristow's investigation team participated together with Equinor's investigation team.

On 09.04.2024, the investigation team had a meeting with Bristow, the operator of the SAR helicopter. The purpose was to inform about Equinor's investigation, as well as to agree on further cooperation. In the same meeting, Bristow informed about their own investigation, in which Equinor participates with an observer. This observer is not a member of Equinor's investigation team.

Furthermore, the investigation team had a meeting on 30.04.2024 with the operational rescue inspector and rescue leaders at the Joint Rescue Coordination Centre's premises at Sola. There was a briefing on the Norwegian rescue service in general, and on the rescue operation on 28.02.2024. The investigation team was also given a tour of the operations center.

On the same day, the investigation team was on a tour of the 330 squadron at Sola, which operates the SAR Queen helicopter used during the rescue operation. Briefings were given by a vessel commander and a rescuer.

The investigation team visited Bristow's department at Flesland, Bergen on 08.05.2024, where there was a meeting with Bristow's Chief Engineer North and a full SAR crew of five people (including an Equinor SAR nurse). Parts of the investigation team were also given a tour of the SAR helicopter, which is stationed at Flesland and is of the same type as the accident helicopter.

3 Factual information

This chapter first shows different parts of Equinor's organisation and how emergency response in Equinor is organised. It then describes external emergency response resources and external units that are relevant in relation to helicopter safety. Then the SAR helicopter, with crew, training, exercises and equipment, is described, before equipment used by passengers in the transport service is described.

3.1 Equinor's organisation – relevant units and departments

Organisational charts and descriptions of various units in the further sub-chapters are taken from OMC documents (Organisation, Management and Control) found in the governing documentation (ARIS).

3.1.1 Exploration & Production Norway (EPN)

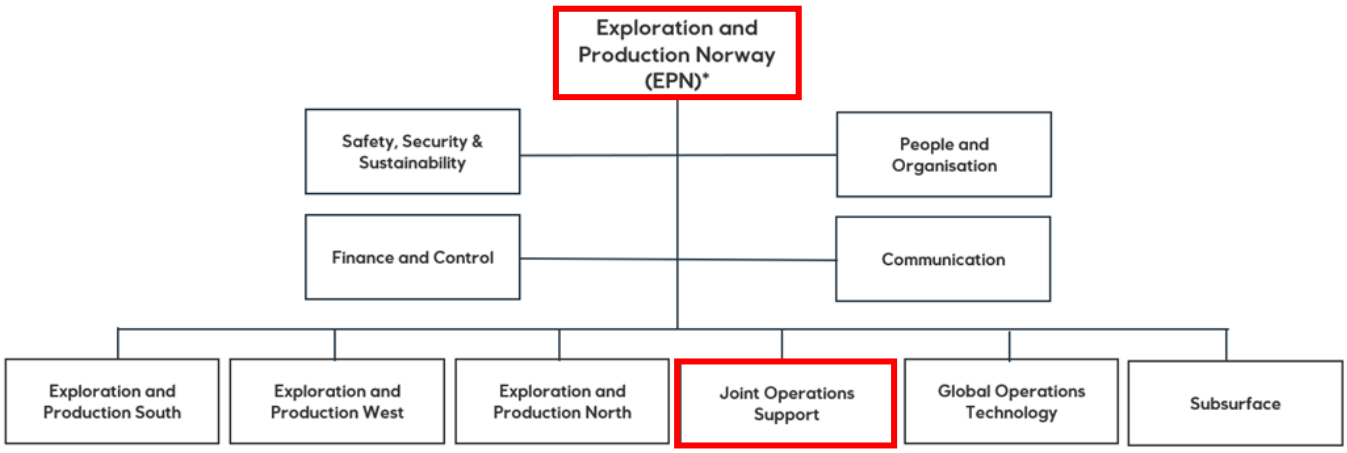

Figure 3-1 Organisation chart for EPN (Ref /18/)

The Exploration & Production Norway business unit is responsible for safe and efficient operations on the Norwegian continental shelf. The executive vice president for EPN is part of Equinor's corporate management team and reports to the CEO.

3.1.2 Joint operations support (EPN JOS)

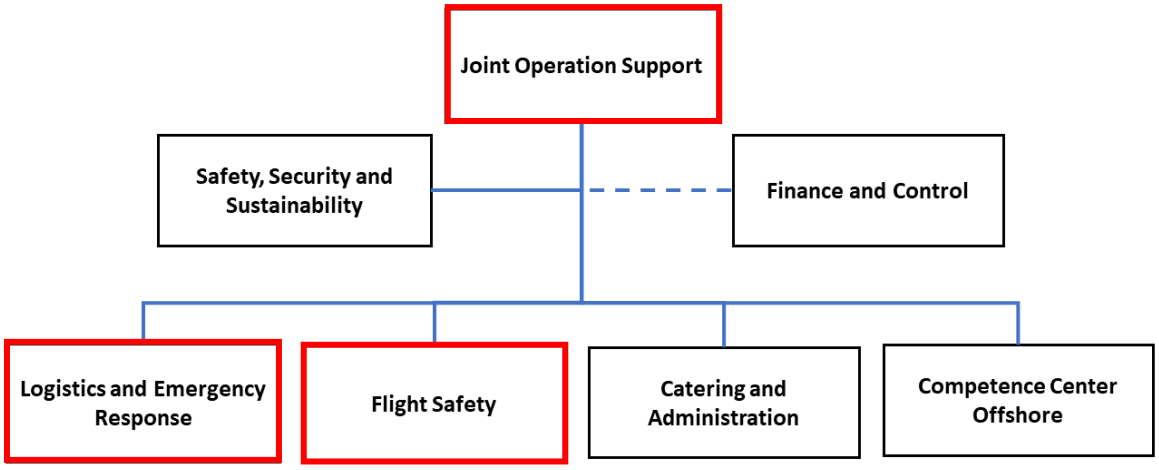

Figure 3-2 Organisational chart for Joint Operations Support (JOS) in the EPN (Ref /19/)

Joint Operations Support is led by the Result Area Director (RO) and will further develop and deliver competitive products and services within Logistics and Emergency Response, Catering and Administration, and Competence Center Offshore.

Joint Operations Support is responsible across Equinor for requirements related to flight safety on behalf of the owner of functional requirements in *FR10 Safety and Security* (**Ref /2/**). Joint Operations Support also provides air transport services in Norway.

3.1.3 Flight Safety (EPN JOS FS)

The Flight Safety unit consists of five people. The unit is responsible for setting requirements for flight safety across Equinor.

This includes liability as follows, but not limited to: (**Ref /19/**)

- Set requirements related to flight safety
- Responsible for Technology Strategy Aviation
- Supervise internal compliance and follow-up of flight safety requirements
- Carry out pre-qualification of airlines
- Carry out verifications of airlines
- Take part in contract evaluations of airlines
- Responsibility for helideck verifications

The Head of Staff Flight Safety reports in terms of resources and tasks to the Director of Joint Operations Support.

3.1.4 Logistics and Emergency Preparedness (EPN JOS LE)

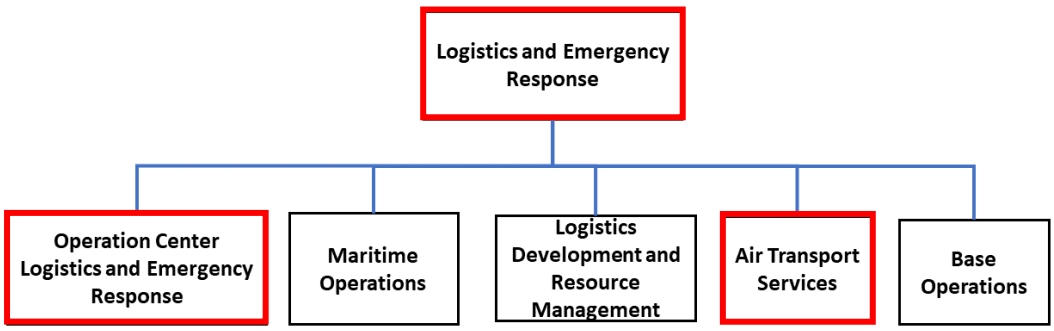

Figure 3-3 Organisational chart for Logistics and Emergency Response (JOS LE) in Joint Operations Support (JOS) (Ref /19/)

The Logistics and Emergency Response unit consists of, among other things, the Operations Center Logistics and Emergency Response, and Air Transport Services.

Logistics and Emergency Response is led by a Result Unit Director with the following main areas of responsibility:
Safe, efficient and sustainable development, planning and operation of Logistics and Emergency Response, including:

- Base operation
- Vessel operations
- Air transport: personnel logistics, transport and SAR helicopter, charter, fixed wing and heliports
- Emergency response: IMT (Incident Management Team – 2nd line emergency response), area based emergency preparedness and ocean surveillance
- Coordinate experience transfer arenas across logistics units
- Supplier management and supplier development for all suppliers within logistics
- Safeguard the contract owner's role and follow-up of contracts and suppliers within their disciplines and functions

The Head of Logistics and Emergency Response is part of the management team in Joint Operations Support (JOS) and reports to the Director of JOS.

3.1.5 Operations Centre Logistics and Emergency Response (EPN JOS LE OPCLE)

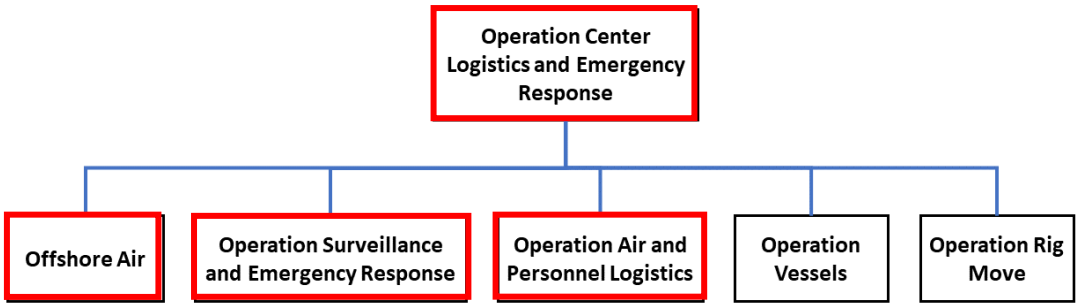

Figure 3-4 Organisational chart for the Operation Center Logistics and Emergency Response (JOS LE OPCLE) in Logistics and Emergency Response (EPN JOS LE) (Ref /20/)

The Operations Center Logistics and Emergency Response sector is responsible for optimisation, as well as safe and efficient operation of logistics and emergency response resources, including:

- Round-the-clock operational resource coordination
- Operation of area based emergency response in EPN (Standby vessels and SAR)
- Personell booking
- Responsible for EPN having an operational IMT (Incident Management Team – 2nd line emergency response)

Deliveries:

- Safe and efficient logistics and emergency operations
- IMT Emergency Response Service

The head of the Operations Centre Logistics and Emergency Preparedness reports to the Director of Logistics and Emergency Preparedness.

3.1.6 Air Transport (EPN JOS EL ATS)

The Air Transport sector is the resource owner for air transport – spends and SAR helicopter, helicopter bases, charter including fixed wing – with the following responsibilities:

- Health, environment, safety and security
- Portfolio management and requisitioning unit in procurement and operator cooperation processes
- Supplier follow-up, including task responsibility for SR (Company Representative)
- Contract owner for contracts within the sector's area of responsibility
- Unmanned Aerial Operations Beyond Line of Sight
- Supplier and market development within the field
    - ATS and PSR (Procurement) identify providers of relevant services for pre-qualification.
    - FS (Flight Safety) conducts pre-qualification on behalf of ATS when required
- Owner of the Aviation Logistics Team (ALT), including meeting structure and agenda
- Personnel Follow-up System (DaWinci)
- Manager ATS takes on the role of Head of Air Traffic Services in Equinor, given by the Civil Aviation Authority of Norway
- Coordinate experience transfer arena across the logistics units, in the NWOW network (New Ways of Working)

The sector provides the following services across Equinor: Support for establishing helicopter services and charter aircraft. Deliveries: Line responsibility for safe and efficient air transport resources, including but not limited to helicopter deliveries, charter aircraft, helicopter bases and survival suits.

The Head of Air Transport reports to the Director of Logistics and Emergency Preparedness.

3.1.7 Offshore Air (EPN JOS LE OPCLE OA)

The Offshore Air department is responsible for the following operations:

- Resource coordination of SAR helicopters within area based emergency response in EPN
- Emergency response tasks on selected installations in accordance with local emergency response plan

Deliveries:

- Safe and efficient SAR coordination
- Emergency response tasks
- Helicopter logistics

The head of Offshore Air reports to the head of the Operations Centre Logistics and Emergency Preparedness.

3.1.8 Operation Surveillance and Emergency Response (EPN JOS LE OPCLE OSE)

The Operation Surveillance and Emergency Response Department is responsible for the following operations:

- Resource coordination of standby vessels
- Oil spill response consultancy EPN

Deliveries:

- Marine and environmental monitoring
- Coordinate the use of standby vessels
- Operation of the EPN IMT by ensuring that:
    - Contingency plan is updated at all times
    - The organisation has the necessary expertise at all times and is further developed
    - The organization trains and exercises regularly and ensures evaluation and learning
    - The organization is able to handle incidents/crises
    - The organisation is able to perform emergency response tasks on behalf of EPN and several other units in Equinor
- Oil spill response consultancy
- Participate in internal and external emergency response networks and forums

The head of Operation Surveillance and Emergency Preparedness reports to the head of the Operations Centre Logistics and Emergency Preparedness.

3.1.9 Operation Air and Personnel Logistics (EPN JOS LE OPCLE OAP)

The Department of Operations Air and Personnel Logistics is responsible for the following operations:

- Resource coordination and optimization of transport helicopters and charter aircraft
- Personnel logistics
- Requisition air transport services in operation

Deliveries:

- Safe and efficient helicopter and personnel logistics

The head of Operation Air and Personnel Logistics reports to the head of the Operations Centre Logistics and Emergency Response.

3.1.10 SAR nurses and doctors in Equinor (CFO, FCOE, SSU, HWE, OHSE/MS)

The SAR nurses are organised in several different geographical areas under the unit OHSE (Operational Health, Safety and Environment). The SAR nurse who died in the accident was organised in region West. Doctors in Equinor are organised in the MS (Medical Services) unit. This includes the Medical Officers (FAL) for the various facilities, and the Medical Officer for the SAR nurses.

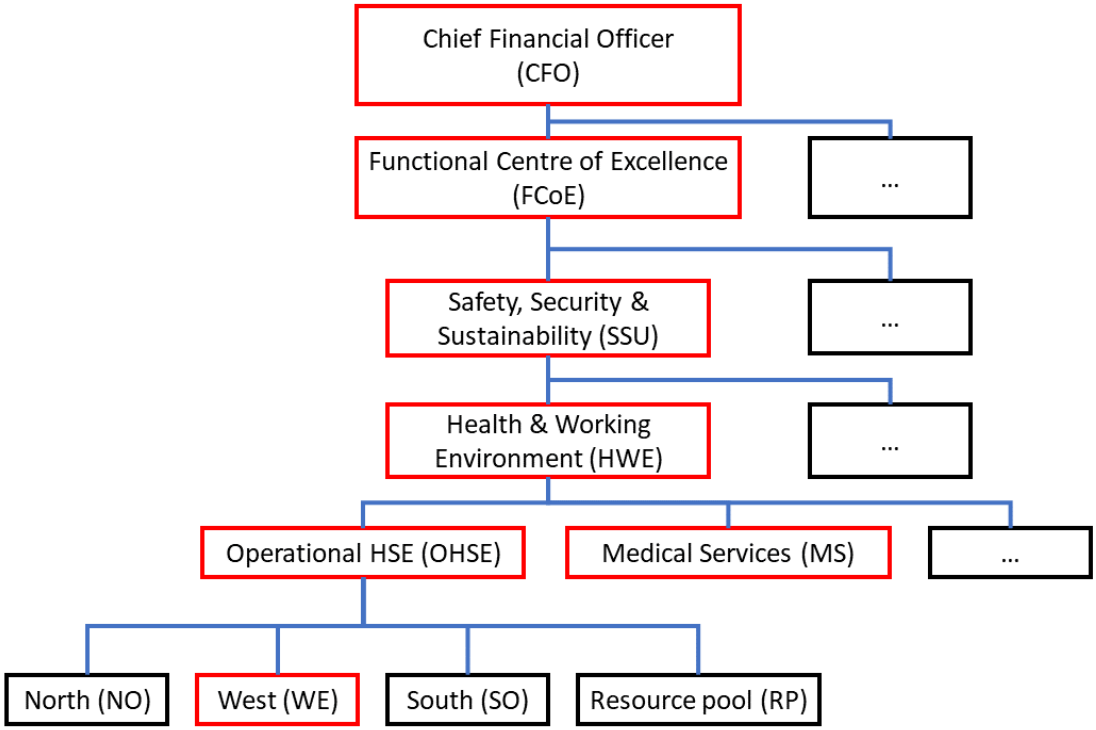

Figure 3-5 Organisational chart for the SAR nurse and the medical officer (FAL) in charge of the SAR nurses (Based on Ref /21/)

3.2 Emergency response resources in Equinor

The Petroleum Act and the HSE regulations regulate the operator's (Equinor's) responsibility in relation to emergency response on the Norwegian shelf. The operator and others who participate in the activities are responsible for ensuring their own response in accordance with these provisions. The operator shall lead and coordinate the efforts of the emergency response resources in the event of hazards and accidents, until any public authorities take over the coordination (**Ref /50/**).

The area of responsibility for emergency response in relation to helicopter accidents is defined in the emergency response plan for the IMT (2nd line) in the following way (**Ref /4/**):

> *Within the safety zone [1]: **Equinor***
> *In transport between the security zone and the airport on land: **JRCC***
> *Within the airport: **Avinor***

Equinor can, if possible, be available with resources that can be used and coordinated by JRCC. In Equinor's requirements for area based emergency preparedness, this is described as follows (**Ref /3/**):

> *The Joint Rescue Coordination Centres (JRCCs) can request support from SAR helicopter / Joint Area-based standby vessels during incidents where JRCC is responsible for coordination.*

Equinor's emergency response is built up with three levels or lines as shown below in **Figure 3-6**.

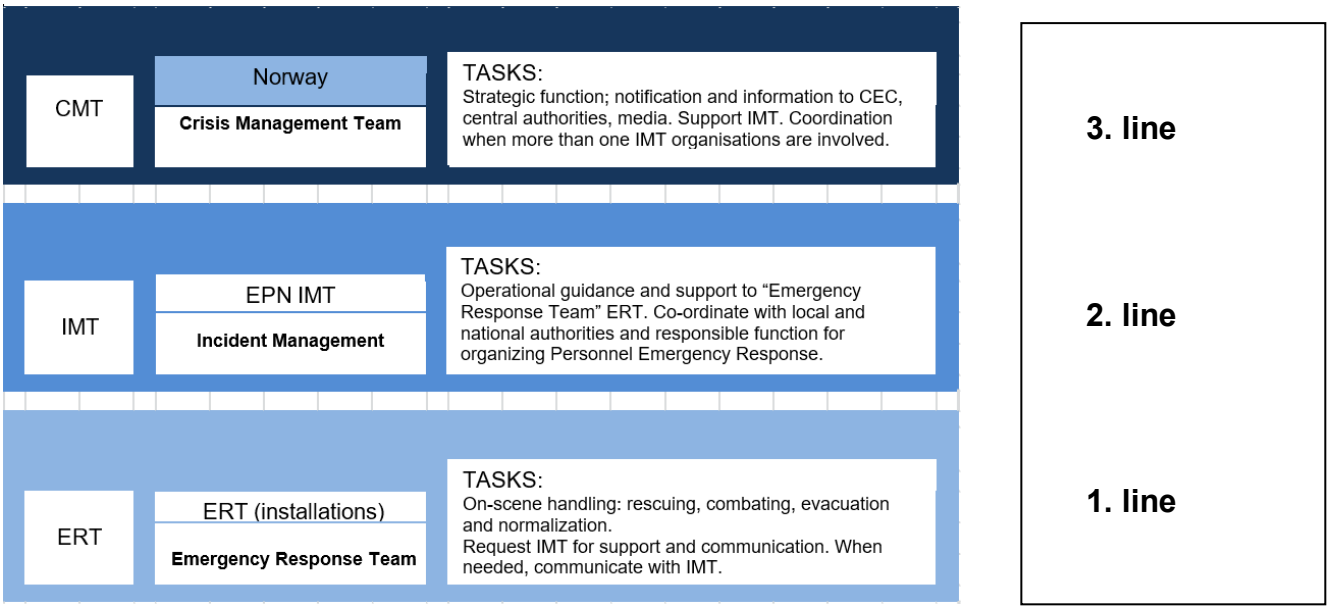

Figure 3-6 The three levels of response in Equinor, EPN (Ref /6/)

3.2.1 Emergency Response Team 1st Line

In the event of an incident at one of Equinor's onshore facilities or offshore installations, immediate rescue and response are managed by the local emergency response organisation. For the onshore facilities, the public support system with police, fire brigade and ambulance personnel will be involved, but this does not apply offshore.

[1] **The safety zone** is defined as follows: A geographically defined area with prohibitions or restrictions with regard to the stay, passage or operation of unauthorised vessels, i.e. vessels that are not part of the licensee's petroleum activities or that have not been granted full or restricted access by the authorities or licensees, including aircraft. Unless the King decides otherwise, the zone extends from the seabed to a maximum of 500 metres above the highest point of a facility in the vertical plane. Horizontally, the zone extends 500 metres out from the facility's extremes, where it is located at any given time. The zone does not restrict activities that are specifically permitted under the Petroleum Act or that are the exercise of public authority.

In this incident with the SAR helicopter that is dedicated to Oseberg, but currently located at Flesland, there was no mobilization of 1st line response, since the incident was outside a location where the 1st line can rescue and fight. The first warning was given directly to JRCC at 19:41 through activated emergency beacons from the helicopter and the SAR crew. At 19:58, the Oseberg SAR coordinator perceived a Mayday Relay signal on emergency channel 16, and at 20:07 alerted SAR Tampen (Statfjord), which was mobilising a SAR helicopter.

3.2.2 Operation Surveillance and Emergency Response (EPN JOS LE OPCLE OSE)

See section **3.1.5** on page **10** for details on this department. In this incident, Surveillance and Emergency Preparedness received the first notification of the incident at 19:59 from the vessel "Sun Tide", which had heard on emergency channel VHF 16 that it was a missing helicopter.

3.2.3 Response 2nd line – Incident Management Team (IMT)

IMT will handle situations in cooperation with public and local authorities and other relevant cooperative actors. It is the Incident Commander (IC, head of 2nd line emergency response) who has the overall responsibility for deciding on mobilization and leading the IMT in connection with the handling of the incident.

In the incident in question, it was decided to muster the IMT at 20:25 after Surveillance and Emergency Preparedness had relayed the warning from "Sun Tide" and a message from JRCC received at 20:07.

The dimensioning of the EPN IMT is based on a contingency analysis from December 2020, and the structure of the EPN IMT is shown in **Figure 3-7**, which shows the on duty roles. The organization will be adjusted as needed based on the type of incident.

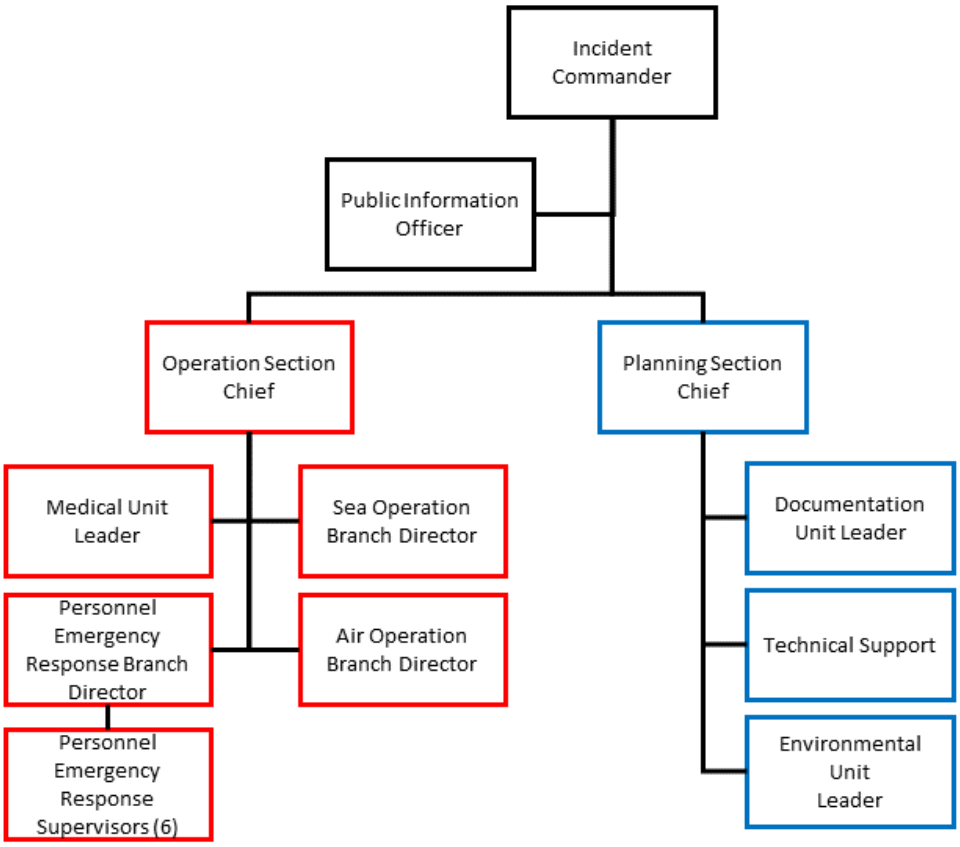

Figure 3-7 EPN IMT emergency response organisation, on duty roles (Ref /6/)

An action plan showing who is responsible for what in a helicopter accident is shown in the table below. As described in the introduction to this section in **3.2** on page **13**, it will be the JRCC that is responsible for coordinating emergency response in the event of a helicopter accident outside the safety zone around an offshore installation.

Table 3-1 Action plan (DSHA 13) Helicopter accident (Ref /4/)

	Notification and mobilization	Management and risk reduction	Demobilization and normalization
Equinor Marine/ OSC	Receive alert and notify IC and decide to muster IMT		Notification form HAVTIL Normalization/follow-up of resources.
IMT	Mapping and mobilization of relevant resources • SAR Helicopter • Shuttle helicopter • Area Emergency Response Vessels • Other vessels Assess and implement temporary exclusion and hazard areas and/or expansion of the susceptibility zone (via NOTAM, NAVCO). **Clarify roles and responsibilities in relation to JRCC, helicopter company, police and municipality.** Notification (according to checklist, below): • CMT • CMT COM on duty Officer • HAVTIL • VP Communications • JRCC • Nurse / HSE coordinator • SAR coordinator • Result Unit RE • PO-manager • Head of PO • Police • Helicopter company • Relevant operation centers • Sailor's church • Clinic for crisis psychology • Unions, shared mail	Situational understanding: • Scope and complexity • POB Overview • Accident site/installation information • Weather • Potential consequences for any emissions • Assess the need for evacuation Coordinating air resources • contact with SAR coordinator • Helicopter company Coordinating vessel resources Assess and implement monitoring Information • Prepare holding statement/ released information **Consider the exchange of liaisons.** Support ERT • Technical • Medical • Contact a nurse • advise medical treatment • Medevac • Informing hospitals • Follow-up of other personnel • Search and rescue Establish a dialogue with RE/relevant technical personnel. Personnel preparedness, including: • Supplier notification • Prepare and operate call center • Follow up Next of Kin (NoK). • Prepare and operate the evacuation and next of kin center (EPS) Update notified parties/actors	Updating/demobilizing relevant resources Reset exclusion and danger areas and/or extended safety/care zone Update notified parties Business Continuity (BC): • Prepare handover documents • Meeting with the relevant unit in operation or BC team where ongoing actions and responsibilities are reestablished. Secure documentation Evaluation/learning: Hot wash up Technical debrief Psychological first aid (defuse/debrief) if necessary:

3.2.4 Personnel response

In the initial phase, the personnel response organisation will look like in **Figure 3-8** and the tasks can be organised as task forces. The total of six positions at five geographical locations shown in the figure are the same as shown at the bottom left of **Figure 3-7** on page **14**. Possible organisation at an evacuation centre and next of kin is shown in **Figure 3-9**. A separate plan has been drawn up for the follow-up of personnel after serious incidents (**Ref /7/**).

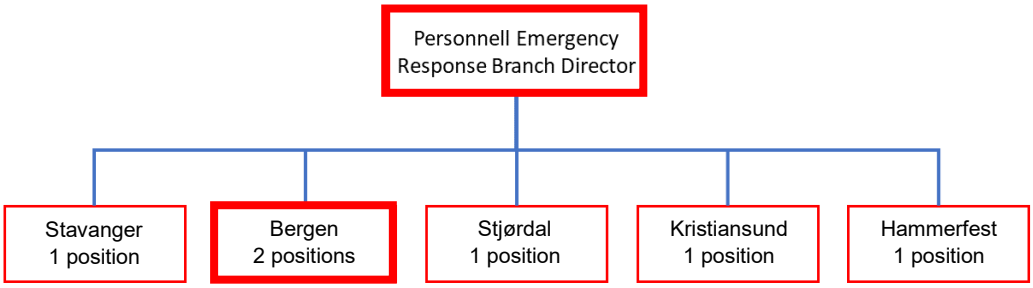

Figure 3-8 On duty personnel in EPN IMT personnel response (Ref /6/)

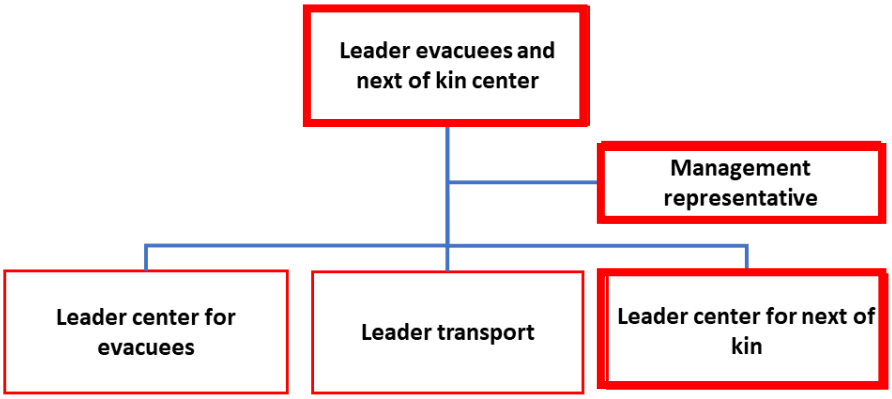

Figure 3-9 Possible organisation of evacuation and next of kin centres (Ref /6/)

3.2.5 Emergency Preparedness 3rd Line – Crisis Management Team (CMT)

The main task of CMT is to manage strategic crises and to implement strategies and measures to limit the consequences for the company. As shown in **Figure 3-10** CMT consists of both on duty personnel (blue boxes) and personnel who are contacted if CMT is to be mobilised (grey boxes). The Chief of Staff is notified of incidents by Equinor's call centre, and then decides, based on dialogue with ERT (1st line) and IMT (2nd line), in consultation with the Crisis Manager, whether CMT should be mustered.

In the incident in question, manager EPN JOS was notified by phone from the head of Flight Safety at 20:22, and then chose to take on the role of Crisis Manager and muster CMT. This muster will mainly be physical with attendance at Equinor's office building at Forus East, Stavanger.

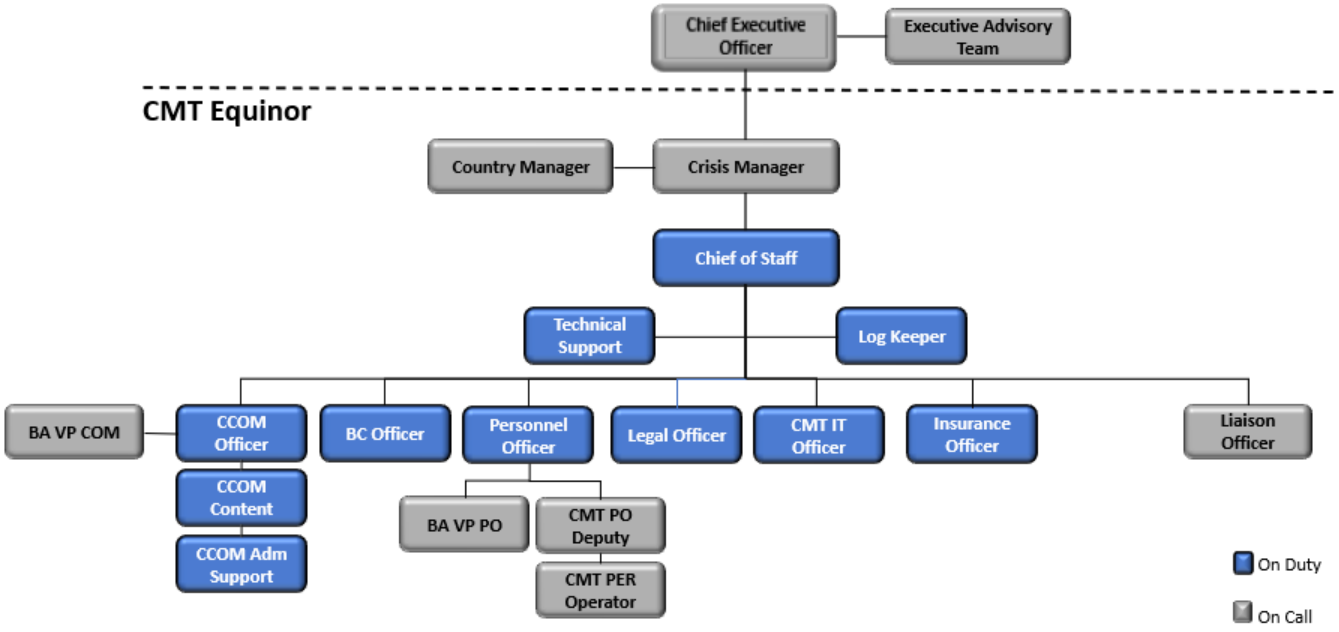

Figure 3-10 Crisis Management Team (Emergency Preparedness 3rd line) organisation in Equinor (Ref /8/)

3.2.6 Business Continuity

The executive vice president of a business area (in this case EPN – Exploration & Production, Norway) can decide to activate the Business Continuity Plan (BCP) and appoints the head of the BC team. Among the tasks of a BC team are to protect the company's assets and resources, support and relieve the business unit/risk owner as well as to prepare the company for the impact of the incident in the medium and long term.

Organizing a BC team is shown in **Figure 3-11** on the next page. It is the leader of the BC team who is responsible for putting together the team, depending on the type of incident.

Unlike the emergency response groups IMT and CMT, the BC team does not have a mandate to make decisions on behalf of the risk owner. The BC team should only **support** the risk owner with recommendations and advice.

In this incident, it was clear early on that there would be a need for a BC team, and the executive vice president of EPN (as risk owner) therefore decided to prepare for this while CMT was still mobilized. The Crisis Manager (CMT) was appointed as the leader of the BC team, and another person took over as the leader of the CMT. The leader of the BC team worked in parallel with CMT to lay the foundation for the BC team and mandate. The BC team was formally established on the morning after the accident, and a handover from CMT to BC team was made at approximately 12 noon when CMT demobilized. The mandate for the BC team states that "*the goal is to confirm normal and safe transport service to Equinor's offshore facilities worldwide. Take care of relatives, employees and others affected. Ensure good stakeholder management*". (**Ref /30/**). The team consisted of 11 permanent members, with another 10 named people.

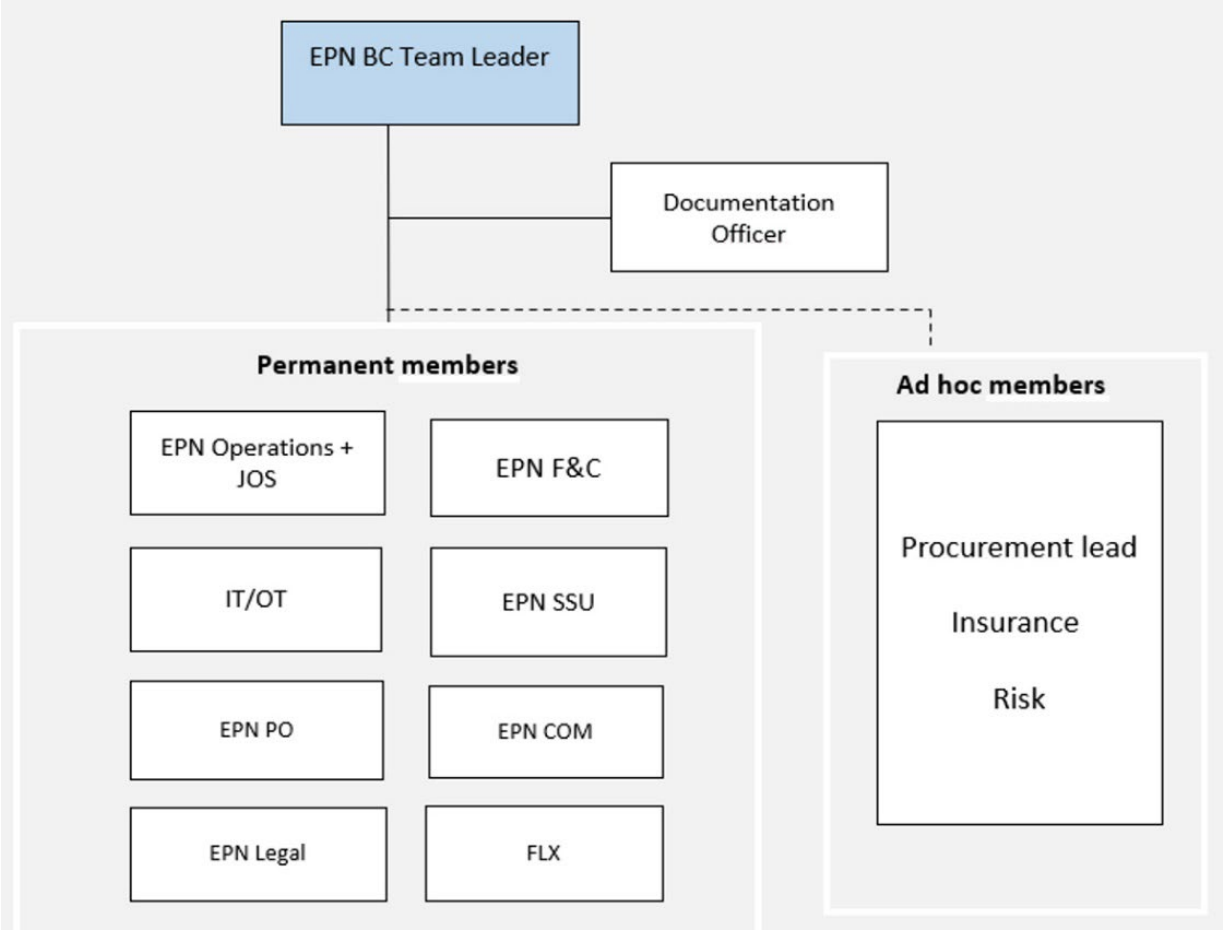

Figure 3-11 Business Continuity Team organising in Equinor (Ref /14/)

3.2.7 Executive Advisory Team (EAT) and Strategic Project Team (SPT)

The CEO of Equinor may decide to establish an Executive Advisory Team or, in consultation with the Crisis Manager, a Strategic Project Team (**Ref /13/**). CMT can operate in parallel with EAT, while for SPT there will be a handover from CMT to SPT when this team is fully operational. A separate document should then clearly identify which tasks and actions CMT has not completed.

In this incident, the CEO chose to create an EAT, but not an SPT. Permanent members of EAT are the Executive Vice Presidents for Legal, Security and Security, as well as Communications. Other members are appointed based on the event but will usually include the executive vice president for the relevant business area, in this case EPN.

3.3 Emergency response resources remotely

3.3.1 Joint Rescue Coordination Centre (JRCC)

The Joint Rescue Coordination Centre is the central public agency for the management and coordination of rescue operations in Norway. JRCC is subordinate to the Ministry of Justice and Public Security. The organisation of the rescue service is described in a resolution from the Ministry of Justice and Public Security (**Ref /49/**). The Joint Rescue Coordination Centre consists of two departments, one department for Southern Norway (JRCC SN) and one department for Northern Norway (JRCC NN). It is the police chiefs responsible for Sola and Bodø respectively who are the commanders-in-chief.

JRCC SN is located near Stavanger Airport Sola. The department's area of responsibility runs from the Skagerrak up to 65 degrees north. To the south, JRCC SN's area of responsibility borders Sweden and Denmark, and to the west to the United Kingdom. The department also has the overall responsibility for all rescue services on land from Trøndelag and southwards (**Ref /65/**).

The rescue service is built on the following basic principles: (**Ref /66/**)

The principle of cooperation: The rescue service is carried out as a cooperative between public bodies, voluntary organisations, private enterprises and individuals. All public bodies that have capacity, information or expertise suitable for rescue purposes are obliged to contribute to the rescue service with available capacities, expertise and powers always. The principle of cooperation means that all actors have an independent responsibility to ensure the best possible cooperation, both in the preparatory work and during rescue operations.

The principle of responsibility: The body that is responsible for functions or tasks on a day-to-day basis is also responsible for these during a rescue operation, regardless of the scope and reason for this.

The principle of integrated service: The rescue service is an integrated service, which means that it encompasses all types of rescue operations related to land, sea and air rescue services.

Coordination principle: The rescue service is coordinated in preparations and efforts through the main rescue coordination centres and subordinate local rescue coordination centres.

Both JRCC NN and JRCC SN are staffed around the clock with three rescue leaders on duty in the operating room. This was expanded from two people through a total of 15 newly hired rescue leaders in 2023. The rescue leaders at the two centres will handle incidents north and south of 65° respectively (at Rørvik in Trøndelag). In total, JRCC handled 8,981 incidents in 2023, of which 2,669 were rescue helicopter assignments and 1,537 were air ambulance assignments (**Ref /51/**). On average, this corresponds to about 25 incidents per day.

The Joint Rescue Coordination Centre has recently (08.05.2024) published national guidelines for the coordination of air resources in the rescue service (**Ref /68/**).

3.3.2 Rescue helicopter service

From the turn of the year 2024, a unit was established at JRCC that will take care of the professional and budget responsibility for the rescue helicopter service, including remaining tasks related to the procurement of the SAR Queen rescue helicopters. The rescue helicopter service operates in mainland Norway at 7 bases: Tromsø, Banak, Bodø, Ørland, Florø, Sola and Rygge. The Air Force at 330 Squadron is the operator of the SAR Queen helicopters at Sola, Ørland, Banak, Rygge and Bodø, while the civilian company CHC Helikopter Service operates in Tromsø with S-92A SAR helicopters and in Florø with Super Puma SAR helicopters (**Ref /67/**).

During the incident on 28.02.2024, two rescue helicopters were mobilized by the Joint Rescue Coordination Centre; SAR Queen 0268 – Leonardo/AgustaWestland AW101 (call sign SAVER50) based at Sola and Super Puma - Airbus AS332 LN-OMH (call sign HKSR5C8) based in Florø. More detailed descriptions of these rescue helicopters can be found in **App D**.

3.3.3 Norwegian Air Ambulance

The Norwegian Air Ambulance Foundation is a non-profit organization that works to move advanced life-saving medical treatment to the patient. The Norwegian Air Ambulance Helicopter operates all 13 medical helicopter bases in Norway, where one of the bases (Lørenskog) has two helicopters, the others one helicopter. At all bases, there is round-the-clock operation, and a backup crew has been established to cover acute illness (**Ref /70/**).

During the incident on 28.02.2024, two air ambulances were mobilised by the JRCC; LN-OOR (DOC60) and LN-OUE (DOC61). More detailed descriptions of these air ambulance helicopters can be found in **App D**.

3.3.4 The Norwegian Society for Sea Rescue

The Norwegian Society for Sea Rescue is a voluntary, humanitarian member organisation that works to make it safer to travel on and around the sea. Their website describes that they have a total of 1,600 rescuers distributed on 53 rescue boats across the country (**Ref /72/**).

During the incident on 28.02.2024, two rescue boats were mobilized by the Joint Rescue Coordination Centre; RS 140 "Bjarne Kyrkjebø" and RS 163 "Kristian Gerhard Jebsen II". More detailed descriptions of these lifeboats can be found in **App D**.

3.3.5 Ambulance boat

Ambulance boats are high-speed boats that, like ambulances on land, carry out emergency health care and transport the injured. The ambulance boats cooperate with the other sea rescue services (**Ref /73/**).

During the incident on 28.02.2024, the ambulance boat MS "Austevolljenta" was mobilized by the JRCC. More detailed descriptions of this ambulance boat can be found in **App D**.

3.3.6 Pilot boat

KYSTVERKET

The Norwegian Coastal Administration has around 300 pilots at its disposal. The 25 pilot vessels are stationed at 18 stations along the coast. During the incident on 28.02.2024, pilot boat "LOS 118" was mobilised by the JRCC. More detailed descriptions of this pilot boat can be found in **App D**.

3.4 Other relevant entities

3.4.1 Civil Aviation Authority

Luftfartstilsynet

The Civil Aviation Authority's main objective is to oversee civil aviation in Norway. The Authority shall in addition be an active instigator for safe and efficient civil aviation according to the overall goals in the transport policy set by the government. (**Ref /58/**)

One of the core tasks of the Civil Aviation Authority is the approval of supervised objects (organisations, aircraft, equipment and persons who are either employed or applying for jobs in civil aviation), supervision through planned inspections of various groups of supervised objects, regulatory development through participation in international cooperation forums, as well as information on preventive aviation safety work. The Civil Aviation Authority is directly subordinate to and reports to the Ministry of Transport and Communications. The Civil Aviation Authority of Norway collects reports on aviation accidents and incidents from the players in Norwegian aviation. The reports are stored, coded, and classified to enable sorting and statistical analysis of the reports. The data is used both for follow-up of aviation safety areas and for planning and carrying out inspections.

The three helicopter companies Equinor has agreements with; Bristow Norway AS, CHC Helikopter Service AS and Lufttransport RW AS, are approved by the Civil Aviation Authority of Norway with approval numbers (Air Operator's Certificate -AOC numbers) respectively. AOC.010, NO. AOC.051 and NO. AOC.086.

3.4.2 Offshore Norge

OFFSHORE NORGE

Offshore Norge (formerly Norwegian Oil and Gas) is an employer and interest organisation for more than 100 companies operating on the Norwegian continental shelf, of which Equinor is one of 28 oil companies. Among other things, they have developed recommended guidelines for area-based emergency response (**Ref /61/**) and flights to petroleum facilities (**Ref /62/**). The guidelines state that everyone in the SAR crew must undergo a check-out program that is adapted to previous experience. This check-out program must be approved by the Civil Aviation Authority.

3.4.3 Helicopter Safety Cooperation Forum on the Norwegian Continental Shelf

The cooperation forum is composed of representatives from the authorities, helicopter operators, the oil industry, Avinor, the trade unions and others involved in offshore flights. Equinor is a member through the industry association Offshore Norge.

The Cooperation Forum's mandate: **(Ref /60/)**

> *The Cooperation Forum for Helicopter Safety on the Norwegian Continental Shelf will work to continuously reduce the risk level for helicopter operations on the Norwegian Continental Shelf.*
> *The cooperation forum will address issues that the members believe may be important for helicopter safety. If the forum finds it relevant, it will assess the circumstances in more detail and propose specific measures.*
> *As part of this, the Cooperation Forum will stay informed about regulations, research and development in the area nationally and internationally. The forum will also assess the need to contribute to regulatory development, existing research or propose new work where it deems it appropriate.*
> *The forum is intended to be a driving force vis-à-vis the responsible authorities and actors, so that relevant recommendations in reports, studies, reports and the like are considered and sought to be implemented.*
> *The Forum shall seek to make available an overview of the status of the handling of relevant recommendations and relevant risk-reducing measures.*

The investigation group sees from the minutes of the Cooperation Forum that the number of planned annual meetings was reduced from four in the period 2009 to 2019, to two annual meetings from 2020. In addition, there was one extraordinary meeting in 2009 and 2010, as well as a total of seven meetings in 2016, which was the year the Turøy accident occurred.

3.4.4 Shared Resource Information Repository

The Shared Resource Information Repository (FRR) is a computer tool in the rescue service that provides a common overview of key resources.

> *Shared Resource Information Repository (FRR) aims to streamline operational efforts in search and rescue and environmental incidents by providing a unified picture of available resources across agencies.*
>
> *The service is developed in such a way that the resource owner themselves updates their own information and share it with other organisations. The service is developed in collaboration with the Joint Rescue Coordination Centre (JRCC), The Norwegian Coastal Administration, The National Police Directorate (POD), The Norwegian fire departments (110-centrals), The Norwegian Directorate for Civil Protection (DSB) and affiliated voluntary rescue organizations.* (**Ref /69/**)

As of today, Equinor's SAR machines are only manually registered in this system, and are then shown as a static, red dot in a map tool. The registration has been carried out by JRCC. However, it is possible for Equinor and other operators to provide automatic updates for real-time positioning of the resource through the AIS (Automatic Identification System) and ADS-B (Automatic Dependent Surveillance-Broadcast) systems. Data tools like FlightRadar24 aren't as reliable in terms of visibility. In the resource register, it is also possible to enter comments such as that the SAR machine is on a training mission, active mission or unavailable due to maintenance. When updating real-time positioning, SAR machines will appear as a blue dot in the map tool. This will make it easier for JRCC to know where the resource is and possibly use the resource in a rescue mission.

3.4.5 Havtil's annual report Trends in risk level (RNNP)

Havtil published on 20.03.2024 the RNNP report for 2023 (**Ref /52/**). Chapter 5 of the report contains risk indicators for helicopter transport. The total number of reported incidents per year is shown in **Figure 3-12** below, but as Havtil writes in Chapter 5.3: "*Incidents in connection with training flights, delays, etc. are not relevant to RNNP.*»

Furthermore, Havtil writes in chapter 5.4.1 that "*From 2021, it was decided that incidents during SAR flights and training that can just as easily occur during ordinary passenger transport shall be included in the figures*". This means that incidents during SAR exercises, such as hoisting to and from vessels, or launching and retrieving buoys, are not included. In this way, the risk level presented in the RNNP report is concentrated on the delivery service.

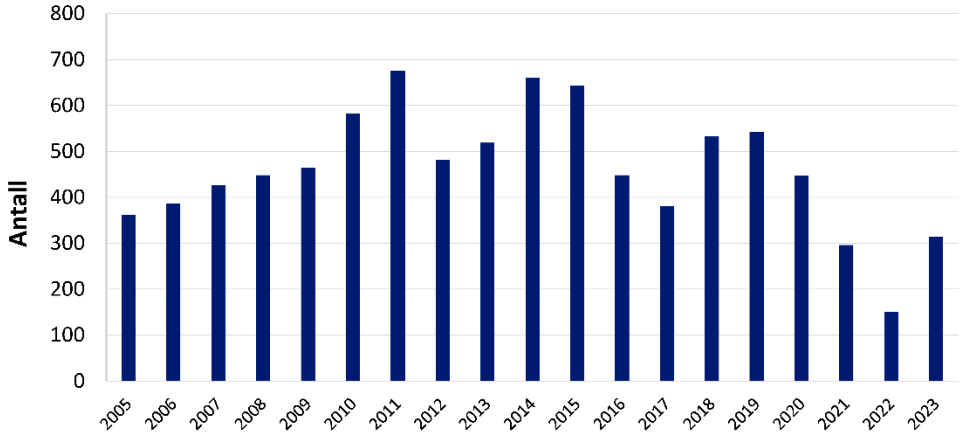

Figure 3-12 Reported incidents in connection with helicopter activities on the Norwegian continental shelf per year (Source: Havtil /52/)

3.4.6 Helicopter safety study published by SINTEF

On behalf of the industry association Offshore Norway, SINTEF has carried out "Helicopter Safety Study 4" (**Ref /53/**). The measures in the report are followed up by the *Helicopter Safety Cooperation Forum* (see **section 3.4.3**). The report summary states:

The overall objective of Helicopter Safety Study 4 (HSS-4) is to contribute to increased safety in helicopter transport of personnel on the Norwegian Continental Shelf.
The report describes important developments in helicopter safety with a focus on the period 2010–2020, but also looks ahead in the years to come. Relevant statistics on accidents/incidents and traffic activity are presented, and an analysis of recent accidents is made. The report looks in depth at some selected topics such as helicopter maintenance, Crew Resource Management (CRM) and resilience in practice. Furthermore, there is a particular focus on investigating similarities and differences between helicopter operations in the British and Norwegian sectors.
The report concludes with a number of recommended measures to increase safety, as well as important prerequisites for maintaining the current level of safety.

In a meeting with the main author of the report (video meeting 24.04.2024), it was confirmed that where SAR helicopters are mentioned, it is only as a risk-reducing measure for the transport service. The safety of the SAR helicopter crew was not looked at per se, but the person in question believes that this may be relevant to include in the next study.

3.5 SAR helicopter – crew, equipment and training

Equinor currently has a contract with Bristow and CHC Helikopter Service for operational SAR helicopter services.

In Sections 20 and 21 of the Framework Regulations (**Ref /46/)** the operators on the Norwegian shelf are required to coordinate and cooperate on emergency response at sea. The industry organization Offshore Norge has recommended guidelines for the establishment of area-based emergency response (**Ref /61/**). Apart from the SAR helicopter in Hammerfest, the SAR helicopters are part of area-based emergency response, which is a collaboration between several facilities and fields. The purpose of area-based emergency response is to share maritime and airborne emergency response resources. This is carried out with area standby vessels, SAR helicopters and ocean surveillance services. Equinor is working with Offshore Norge to develop industry standards, see **section 3.4.2** on page **21**.

In accordance with internal requirements in Equinor (**Ref /3/**), the SAR helicopters have a normal mobilisation time of 15 minutes in the period 07:00 – 19:00, and 20 minutes in the period 19:00 – 07:00. Mobilization time means from the time the notification is received until the helicopter is in the air at the latest. For the SAR helicopter placed on land, the mobilisation time was increased to 30 minutes in the period 19:00 -07:00 after an inspection by the Civil Aviation Authority, for the crew to get sufficient rest, which entailed overnight accommodation at a nearby hotel.

The purpose of the SAR service in Equinor is to (**Ref /35/**):

1. Ensure rescue of personnel at sea in accordance with defined DSHAs (Defined Situations of Hazards and Accidents)
2. Provide medical evacuation according to defined DSHAs
3. Provide oil spill and condition monitoring

What determines the dimensioning (including the number of helicopters, location, crew and equipment) are the applicable DSHAs and regulations in the area the helicopter operates.

Equinor's SAR helicopters are located both offshore and onshore.

Currently, bases for SAR helicopters are used on:

1. Hammerfest (onshore based)
2. Heidrun (offshore)
3. Tampen (offshore – Statfjord)
4. Oseberg (temporarily onshore based at Flesland from 01.09.2023)
5. Johan Sverdrup (offshore)

In addition, Equinor has a Medevac helicopter (Medical Evacuation) under contract that is stationed in Brønnøysund.

On 25.01.2024, the company Lufttransport RW AS was awarded a contract with Equinor. In the second quarter of 2025, they will take over two new SAR helicopters from the manufacturer (**Ref /36/**). These helicopters are of the type Leonardo AW 139, and will be operational from 2026. One helicopter will be stationed at the Oseberg field centre, while the other will be stationed at Flesland as a backup SAR and otherwise used for passenger traffic to and from Equinor's installations.

To investigate how the SAR nurses perceive the available protective equipment, the completion of assignments, exercises and pool training, the investigation team has prepared a survey that is shown in **App H**.

3.5.1 Crew in SAR helicopter

An offshore SAR crew consists of five people:

- Two pilots, where one is the commander and the other the first officer
- Rescuer who is hoisted down to a vessel or sea to pick up people. The rescuer must also assist the SAR nurse in the treatment of seriously ill and injured patients, and have the competence to stabilise and treat these patients on their own if the situation requires it (**Ref /45/**)
- Technician/elevator operator who will perform technical/mechanical tasks on board as well as operate the winch to hoist rescuer, SAR nurse, stretcher and injured
- SAR nurse who will be a nurse anaesthetist with special expertise in prehospital emergency medicine. The SAR nurse together with a rescuer shall assist personnel on offshore installations (such as nurses and first aiders) with life-saving and stabilising treatment, before transport to land (**Ref /12/**). Professional requirements for SAR nurses are described in WR2552 (**Ref /10/**) and emergency medical treatment protocols are found in WR2553 (**Ref /11/**). SAR nurses must be regularly certified in accordance with internal requirements (**Ref /22/** and **/5/**)

Health requirements for SAR nurses and rescuers, respectively, are described in **App E** and **App F**.

In accordance with the contracts, Equinor has chosen to staff the SAR helicopter with SAR nurses from its own resources, while the helicopter operators are responsible for the rest of the crew. The SAR nurse alternates between being the HSE coordinator or HSE manager for the first week of the shift, and part of the SAR crew the next week.

3.5.2 Regular exercises with SAR helicopter

The investigation team had a meeting at Bristow at Flesland, Bergen where a full SAR crew of five people explained the process of establishing an exercise program:

- The vessel commander starts the working week by checking the competence status in the computer tool iSAR. Here it is made visible with colour codes if anyone in the crew in question has training elements that are approaching their expiration date, or if it has already expired
- Based on status, the commander selects training elements that are reviewed with the first officer to plan the coming days' exercises. Here we also consider the calendar (light/darkness), weather and resources. To meet some competence objectives, it is necessary to train in low light and with sufficiently high waves (rough sea)
- Normally, 2-3 exercises are carried out per week, 1-2 of these are longer trips
- If the SAR crew has been on a mission, this can also meet the competence requirements registered in iSAR
- If the exercises include hoisting to and from vessels, it is investigated whether there are relevant vessels nearby. This also involves checking the language skills of the vessel crew since it must be communicated on the radio. Vessels cannot be required to participate in exercises, but the SAR service also receives inquiries from vessels notifying them that they wish to participate
- One hour before departure, the commander leads a brief with the entire SAR crew with details for upcoming exercise(s)
- For exercises with hoisting, the elevator operator will first carry out a "dummy run", i.e. a test round where all procedures are reviewed, the helicopter door is opened, the helicopter is flown to the correct position, but without the rescuer being involved
- If a SAR nurse is to be hoisted to a vessel, the rescuer is always hoisted down first
- Only the rescuer is hoisted to the sea

The investigation team has received the following from the SAR coordinator for Oseberg related to routines when the SAR helicopter is placed on land:

Routines and tasks for SAR coordinator at training flights for SAR stationed in Bergen (**Ref /25/**)

- SAR captain informs about plan for training
- The SAR captain submits a "pre-flight report" for the training. The report contains, among other things, information about the expected start of the training, duration of the training, a brief description of the training, as well as an overview of who is on board
- SAR coordinator creates trip in DaWinci (computer tool in helicopter logistics) with expected departure time, route and crew
- The SAR captain informs the SAR coordinator of the departure time and arrival time by telephone after the end of the training. SAR coordinator logs the times in DaWinci

The SAR coordinator normally has no contact with SAR crew during training that takes place close to land. In the event of SAR missions, the SAR coordinator contacts SAR crews via ATC or satellite telephone

3.5.3 CRM-training

Crew Resource Management (CRM) is dealt with in a separate chapter in the latest edition of the Helicopter Safety Study from SINTEF (**Ref /53/**). There, CRM is defined as "*an approach to understanding what characterizes effective collaboration with regard to security*". Furthermore, the authors write that "*If procedures and standards fail or do not exist, good CRM practices should be able to provide the crew with the best starting point for regaining control and minimizing the consequences of a critical situation*."

The investigation team has been made aware of an email with the importance "High" that was sent on 28.09.2016 from an advisor in the health and working environment in the company (**Ref /34/**). In the email, titled "CRM training", it says:

> ***To all SAR bases***
> *Together with NN (Advisor) in Flight Safety, arrangements are made for the SAR nurses to participate in the helicopter companies' CRM training. The helicopter companies will facilitate that the participation of the SAR nurses is gathered in a good way. CRM training is conducted annually. CHC will arrange CRM training for its SAR crew, including the SAR nurses, in December and June. Bristow has not given dates yet but has confirmed that the SAR nurses will participate. I recommend that the SAR nurses' contact persons at the SFB, Oseberg Field Centre and Heidrun are in dialogue with the helicopter companies on behalf of all the SAR nurses.*
> *Offshore Health Services looks after its own SAR nurses in Stavanger and Hammerfest and facilitates these.*

3.5.4 Float elements

Helicopters are equipped with inflatable flotation elements, also called floats. In the event of a controlled emergency landing at sea, these must be inflated and help the helicopter, which has a high centre of gravity and is thus at risk of overturning, to stay afloat and in the correct orientation. The floating elements must be manually reinforced by the pilots. They can then be triggered either automatically on contact with water, or manually by the pilots.

Regarding the SAR helicopter that sank on 28.02.2024, the NSIA wrote on its website the following on 08.03.2024: (**Ref /44/**)

> *The helicopter was equipped with emergency floats. These were armed, but did not deploy automatically. The floats are designed for a controlled emergency landing in water. Even though the accident appear to be a relatively low energy impact, it can not be called a controlled emergency landing. The fact that the floats did not deploy can be because the situation that occurred was outside the limitations of the system. The NSIA can therefore not state that there were any technical faults with the flotation system.*

The NSIA updated the description of the floating elements on 13.05.2024: (**Ref /44/**)

> *The helicopter was equipped with floats. These were armed but were not automatically deployed during the uncontrolled impact with the sea. The flotation system of the helicopter type is designed to function in a controlled emergency landing on water. When the main rotor blades hit the sea, the power supply required for automatic deployment stopped and thus prevented the possibility of an automatic deployment of the flotation elements. The investigation includes the functionality and system design of the floats. New international regulations which, among other things, include emergency flotation elements for helicopters have been published. The S-92 helicopter type will have to undergo modifications to satisfy these new regulations. The date for full implementation is set to August 2026.*

Both Bristow and CHC Helikopter Service have the same specification for the flotation elements: 5 Float Bags (approved for **Sea State 6**, see table below) System installed (**Ref /37/** and **/38/**).

The World Meteorological Organization (WMO) has a table of 10 different levels of sea states with associated significant wave heights (the average height of the 1/3 highest measured waves) as shown in the table below (**Ref /83/**).

Table 3-2 Sea state

WMO Sea state	Wave height (meters)	Characteristic	
0	0	Calm (glassy)	
1	0 to 0.1	Calm (rippled)	
2	0.1 to 0.5	Smooth (wavelets)	
3	0.5 to 1.25	Slight	
4	1.25 to 2.5	Moderate	
5	2.5 to 4	Rough	
6	**4 to 6**	**Very rough**	**← Sea State 6**
7	6 to 9	High	
8	9 to 14	Very high	
9	Over 14	Phenomenal	

3.5.5 Deployable emergency locator transmitters in the helicopter

Both Bristow and CHC use the same emergency beacon in the SAR helicopters: Automatic Deployable ELT (ADELT), 15-503-134 -ELT, ARTEX C-406-N or CPI (HR Smith) (**Ref /37/** and **/38/**).

Figure 3-13 Emergency locator transmitter in the SAR helicopter (source: Website for HR Smith, Ref /78/)

The emergency locator transmitter can be operated manually from a panel in the cockpit, or automatically from a crash sensor (multi-axis accelerometer) or by a switch activated by water. It detaches from the helicopter, floats, and sends out a signal with GPS coordinates for the last known position.

3.5.6 Acoustic transmitter for locating the flight recorder in a helicopter underwater

Figure 3-14 Emergency beacons in the SAR helicopter (source: Dukane website, Ref /79/)

Both Bristow and CHC use the same acoustic transmitter to locate the flight recorder of an underwater helicopter: the Dukane DK 120 Underwater Locator Beacon (**Ref /37/** and **/38/**).

It is automatically activated in water, can withstand water depths of over 6 km, provides at least 90 days of continuous operation, and can be located at a distance of 1.8 – 3.6 km. It is thus not detached from the helicopter as the emergency beacon in the previous paragraph but is permanently mounted.

3.5.7 Night Vision Goggles (NVG)

In the contracts with both Bristow and CHC (**Ref /37/** and **/38/**), it is specified that there must be three night vision goggles (NVG) in the rear cabin. These are to be used when visually searching in water during dark or poor visibility. The cabin must therefore be equipped with lights that are compatible with NVG, and windows on both sides must be adapted for searches. The cockpit will also be compatible with NVG, but both contracts specify that any installation, use and qualification of NVG for the pilots will take place by new agreement.

In a meeting with the Rescue Helicopter Service (330 Squadron in the Air Force, see **section 3.3** on page **19**) the investigation team was informed that they use NVGs in the cockpit when it is dark. For example, if they are working towards an illuminated vessel, one pilot will take off the NVG, while the other has the NVG activated in case they need to move quickly away from the illuminated area. The pilots of the Norwegian Air Ambulance also use NVG (**Ref /71/**).

Figure 3-15 Night vision goggles (NVG) for helicopter pilots (source: Leonardo helicopters website, Ref /81/)

3.5.8 Personal protective equipment for SAR nurse

The next sections **3.5.9** to **3.5.14** deal with personal protective equipment for the SAR nurse. The SAR nurse is responsible for being correctly equipped, and purchases equipment based on an approved equipment list (**Ref /33/**). The immersion suit or survival suit must be personalized. The helicopter operator provides the remaining personal protective equipment.

3.5.9 Survival Suit

From the list of SAR nurse protective equipment: PS4043 Viking Helicopter Pilot Survival Suit CHC SAR. This is equipment that the SAR nurses procure themselves and sends for maintenance at the manufacturer Viking every year. Each SAR nurse therefore needs two survival suits.

Figure 3-16 Survival suit (sources: Equipment list /33/ to the left and Viking-Life to the right Ref /80/)

Outer fabric: NOMEX® GORE-TEX®
Detachable hood and gloves, detachable pockets that give the user individual options, high neoprene collar.
The suit has a separate torso liner that allows for easy dressing and general ergonomics.
Special instructions: Must be used with an approved life jacket.
Service interval: 1 year (2 years if sealed in vacuum bag).

For the SAR crew to be able to carry out the work in the helicopter, the survival suits are personalised with cuffs and neck collars. These are critical leak points and require proper maintenance. In the meeting with Rescue Squadron 330, the investigation team was informed that they have a dedicated responsible person who inspects, and pressure tests the survival suit every 4 months, and makes the necessary repairs. The survival suit is thinner than the suit for passengers in the transport service (see **section 3.5.15** on page **32**), so the SAR crew will therefore drop their body temperature more quickly if they end up in the sea. Cooling down is also dependent on clothing under the suit, and individual differences such as physical fitness and amount of body fat. Unlike survival suits for passengers in the transport service, the SAR crew has a loose hood. This is because the SAR crew needs to wear a helmet with communication equipment, and only puts on a hood in the event of evacuation. The SAR crew also wears loose boots on top of the suit's nylon socks and different types of loose gloves depending on the mission, while the survival suit in the transport service has integrated boots and gloves.

3.5.10 Life jacket

According to the current contracts, both Bristow and CHC must use the same type of life jacket for SAR nurses: Viking PV9365 vest with STASS (Short Term Air Supply System), emergency breathing system (CAT A) (**Ref /37/** and **/38/**). However, the responses that the investigation group has received from the SAR nurses in a survey (see **App H**) indicate that there are different types of life jackets in use. The contracts allow for the use of life jackets of a similar type: "*Viking PV9365 vests with STASS or similar worn by crew*". On the SAR helicopter the investigation team visited at Flesland, the Beaufort MK44 vest is used.

Figure 3-17 Viking life jackets on the left (source: Viking website, Ref /80/) Beaufort MK44 on the right (source: a-ss.no)

Design features of life jacket specified in contract:
Emergency lights and whistle, buddy line and lifting strap, inflatable buoyancy chamber and integrated splash cap. The life jacket must be manually deployed outside the helicopter.

The service interval for the life jacket is 1 year.

3.5.11 «Monkey strap» / Lanyard

If the side door of the helicopter is to be opened, all crew in the rear cabin who are not strapped into the seat must be secured against falling out. This is done with a safety line called a "Monkey strap" or lanyard. It is attached to a fixed point and in a harness on the person and can either be disconnected with a quick coupling or loosened in a controlled manner by unscrewing a locking mechanism on a carabiner. The investigation team has been informed that work is being done to install a sliding rail in the ceiling for this lanyard.

3.5.12 Sling / Harness

If the rescuer is to be hoisted to a vessel or sea, or if the SAR nurse is to be hoisted to a vessel, a special lifting sling or harness is used. Before hoisting, the lifting harness must be connected to the lift hook. Then disconnect the lanyard described in the previous section. This order is necessary so that the person is always protected against falling out of the helicopter. Correspondingly, this is done in reverse order when the person is hoisted back into the helicopter; First, the lanyard is connected before the lift hook is loosened.

3.5.13 Emergency breathing system

The crew of SAR helicopters use pressurized bottles of breathing air in case of underwater evacuation from an overturned helicopter.

Bristow uses Tiger Performance Series 4500, Submersible Systems HEED 3, Aqualung SEA LV 2 og Aqualung SRU-40 B/P (**Ref /39/**).

CHC uses Poseidon Spare Air (EBS) 4,500psi and FORCE Technology Aqualung LV2, but is in the process of replacing these with Aqualung EBS-System MEER (**Ref /40/**).

Figure 3-18 Examples of different pressurized emergency breathing systems (source: Viking-Life website, Ref /80/)

3.5.14 Personal locator beacon

According to the contracts, both Bristow and CHC must use the same type of personal locator beacon for the SAR crew, Techtest 500-12Y (**Ref /37/** and **/38/**). On the SAR helicopter Bristow has stationed at Flesland, ACR AquaLink is used.

Both the Techtest 500-12Y and AquaLink must be activated manually by holding down a button for a few seconds, unlike the HPL-2 locator beacons, which after arming are triggered automatically upon contact with water (see **section 3.5.18** on page **33**).

Figure 3-19 Personal locator beacons for SAR crews (source: Website for HR Smith, Ref /76/ and website for ACR, Ref /77/)

3.5.15 Equipment in a transport helicopter

There are 24 Equinor-employed SAR nurses, but many thousands of offshore employees who use the transport service between land and the offshore installations. In the following chapters, the investigation team has therefore chosen to show equipment for passengers in the transport helicopters that is different from equipment used in the SAR helicopters. The helicopter used by Equinor is in both cases the same, the Sikorsky S-92A.

Before each departure by helicopter, all passengers must watch a safety video. Among other things, details are repeated about the correct use of the survival suit, the emergency breathing system, the personal locator beacon, the seat belt and the emergency exits in the helicopter. The ground crew at the helicopter terminal or the helideck crew on the platform check that all passengers are buckled up with seat belts before the helicopter takes off. The pilot reminds passengers to pull the zipper of the survival suit all the way up before landing offshore.

3.5.16 Survival suit in the transport helicopter

Passengers on offshore transport helicopters use the SeaAir Barents II survival suit, manufactured by Hansen Protection. Requirements for survival suits are described in guidelines from Offshore Norway (**Ref /63/**). An article from Teknisk Ukeblad (**Ref /82/**) describes that in practical tests with these suits in the sea, the body's core temperature dropped by 0.5 °C within six hours at 0 °C in the water. This is better than requirements in the standard from 2013 that allow a drop in core temperature of 2 °C under the same conditions (**Ref /64/**).

Figure 3-20 Survival suit for passengers in transport helicopters (source: Hansen Protection website, Ref /74/)

The suit has, among other things, an integrated emergency breathing system (see **section 3.5.17**), an antenna module for locator beacons, a hood for splash protection, emergency lights, a buddy line with a floating hook and an integrated harness for lifting during rescue from the sea. The suit has built-in buoyancy and is therefore used without a life jacket. It is possible to inflate the collar manually for a safer floating position. These suits are intended for passengers only and are not suitable for carrying out work in SAR service.

3.5.17 Emergency breathing system in transport helicopters

Passengers in transport helicopters have a bag in their survival suit that the user fills with air through a breathing nozzle when the valve in the equipment is activated. This air can then be reused for a period during underwater evacuation if the helicopter has overturned. This emergency breathing system in the delivery service is used with a temporary exemption from the Civil Aviation Authority. They set requirements for breathing systems that can be established underwater, as shown in **section 3.5.10** on page **30**.

Figure 3-21 Integrated emergency breathing system in SeaAir Barents II survival suit (source: YouTube video from Hansen Protection, Ref /75/)

3.5.18 Personal locator beacon

When passengers in transport helicopters enter the helicopter, an HPL-2 personal locator beacon is attached to each seat. This must be installed in an HPL Antenna Module that is integrated into Hansen Protection's SeaAir Barents II survival suit (see **section 3.5.15**). The locator beacon is then armed and automatically triggered in the event of contact with water.

Previously, the locator beacons of offshore employees have sent signals to the emergency frequency 121.5 MHz (VHF), which only rescue helicopters and rescue boats have been equipped to receive. HPL-2 transmits several types of signals that also utilize the AIS network with GPS positioning. AIS signals are picked up on AIS receivers on board all modern helicopters and ships.

Figure 3-22 Personal locator beacon for passengers in transport helicopters (source: Viking-Life Ref /80/)

4 Procurement and contract

On 31.08.2022, Bristow was awarded a contract for SAR services Southern Norway for the period 01.09.2023 to 31.01.2028, with options for Equinor for extensions (**Ref /37/**). The background for the procurement was that several framework agreements for southern Norway were approaching their expiry date. Furthermore, there was a desire for a framework agreement for the entire area instead of separate agreements per installation. The SAR bases for southern Norway are Bergen, Sola, the Johan Sverdrup field, the Statfjord field (Tampen SAR) and the Oseberg field.

In parallel with the tender process for Southern Norway, a tender process was underway for Central Norway for SAR services, for the same reasons as mentioned above. The SAR bases for Central Norway are Kristiansund, Brønnøysund and the Heidrun field.

Both CHC and Bristow were invited to both tenders. CHC was awarded the contract for Central Norway for the period 01.02.2023 to 31.01.2028 with options for Equinor for extension (**Ref /38/**).

For helicopter procurements, it will be a prerequisite that the helicopter company and helicopter type are approved by the Civil Aviation Authority. Equinor will also require prequalification based on its own requirements. These requirements may be stricter than those of the Civil Aviation Authority. The obligation to follow Offshore Norway's Recommended Guideline 066 for flights on petroleum facilities (**Ref /62/**) is incorporated as a requirement in the contracts.

The procurement process had a relatively tight timeline given the extensive volume to be contracted. In the first phase of the process, there was a surplus market for offshore helicopters, but this changed abruptly with the outbreak of the war in Ukraine in February 2022, both for helicopters and access to spare parts.

The procurement team was composed of a management team, a technical and a commercial team. Overall, the team was experienced and had competencies that complemented each other. The investigation team has been told that there was openness and good dialogue. All of them had insight into the overall offers and thus it was possible to link technical, commercial and safety considerations. Commercial offerings and technical qualifications were included in the overall assessment, where safety was of crucial importance. When the contract was awarded, a company representative (SR) was appointed who is responsible for following up the overall contractual relationship, and for coordinating internal resources and competencies depending on the matters that are raised in contract meetings and that need follow-up.

The procurement team were not decision-makers, but only made recommendations. In accordance with requirements in governing documentation (R-103968), a meeting was held on 08.04.2022 with unions and safety delegates about the new procurement strategy for SAR helicopters in southern Norway. Then, on 16.08.2022, there was an information meeting on the recommendation for a new SAR contract. The final decision on the contract awards was made by EPN's executive vice president.

5 Event

Fact box 5-1 Use of FlightRadar24 and MarineTraffic

It is not in the investigation team's mandate to conduct a detailed analysis of the course of events, but this has been included to the extent that it affects Equinor's emergency response. For this purpose, the investigation team has used the services FlightRadar24 (**Ref /56/**) and MarineTraffic (**Ref /57/**). The investigation team is aware that data obtained from these services may deviate from the correct one, but is used as an indication of position, altitude (FlightRadar24 - based on barometric pressure) and speed. There may be cases where helicopters do not appear on FlightRadar24, but the investigation team is aware that data may be available through other services

5.1 Context

With effect from 01.09.2023, Bristow was awarded a contract for SAR service South Norway. The helicopter that crashed was a Sikorsky S-92A with the number LN-OIJ (see technical details in **App D**). The helicopter was temporarily based onshore at Flesland Airport outside Bergen in anticipation of a new and smaller helicopter type adapted to the SAR hangar at the Oseberg Field Centre. This is planned to start in early 2026.

In the period 01.09.2023 to 31.12.2023, the SAR helicopter carried out 28 missions (**Ref /31/**) (ambulance, emergency response, evacuation and technical assistance) and a total of 53 training flights (**Ref /32/**). In total, there were eight different SAR nurses on these assignments or training flights.

On Wednesday 28.02.2024 at 18:23, the SAR helicopter took off from Flesland with the assigned call sign "NORSAR6". Normally there is a crew of five people (see **section 3.5** on page **24**), but during this exercise there was an extra rescuer in connection with training and re-qualification. The plan for the exercise is shown in **App I**. The helicopter's speed and altitude are shown in **Figure 5-1**, while the flight route is shown in **Figure 5-2**. Note that one hour must be added to get the local time.

After flying west from the airport at an altitude of over 1200 feet and speed above 100 knots, the helicopter descended and lowered its speed. According to the plan for the exercise, the crew deployed a signal buoy west of Sotra, which was to be located and picked up later in the evening. Similar exercises have been carried out several times earlier in the year and are standard procedure for training SAR crews.

Later, the helicopter climbed to an altitude of about 700 feet, increased its speed to 125-150 knots and headed for the Hjeltefjord north of Bergen. From 18:52, the helicopter followed the ship "Wilson Twisteden" at an altitude of approx. 300 feet and a speed of 8-10 knots. This was another part of the planned exercise, where the rescuer, SAR nurse and a stretcher were hoisted to and from the ship. At 19:23 this exercise ended, the helicopter went up to about 1200 feet, increased speed to about 100 knots and went south-west. At 19:34, the helicopter was back in approximately the same area west of Sotra as it had been before the exercise with "Wilson Twisteden". The altitude was reduced to about 400 feet, and speed to 40-50 knots while the helicopter completed a clockwise circular motion. The investigation team understands from the exercise plan (**App I**) that this was done to locate the signal buoy that was deployed an hour earlier.

The last recorded signal from the helicopter on Flightradar24 was at 19:38:52 at altitude 400 feet, speed 16 knots, course 160 degrees. See disclaimer regarding the use of this data in **Fact box 5-1** above. For further details about what happened and why, the investigation team will refer to the NSIA's work, which is still ongoing.

Preliminary statements and findings from the NSIA are described in **Chapter 6** on page **50**.

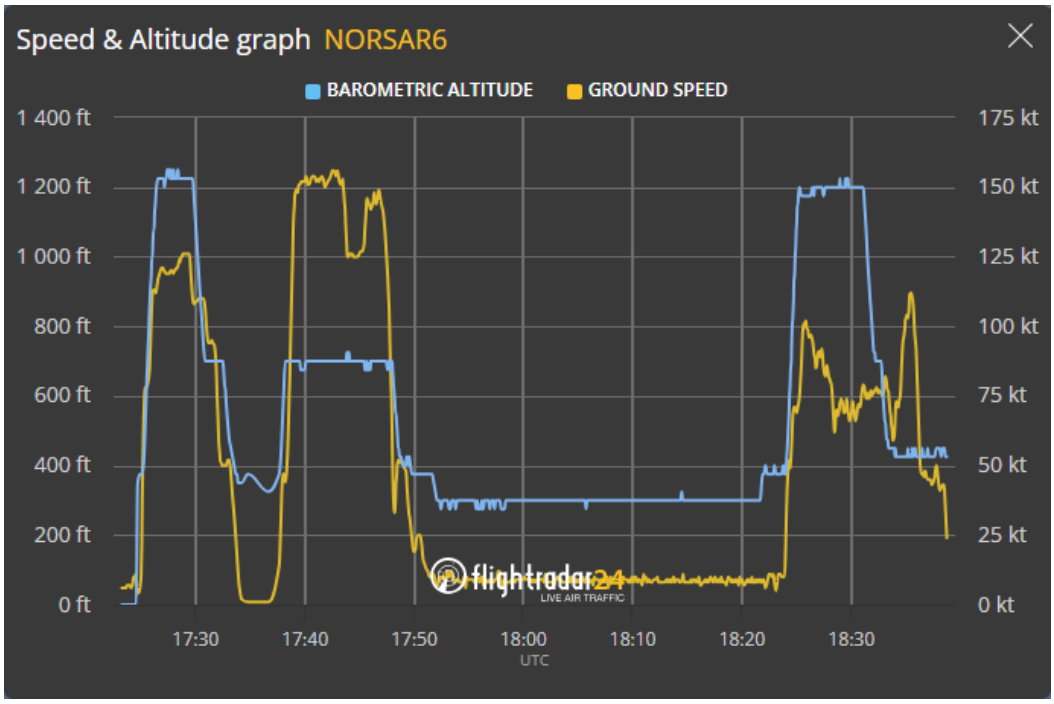

Figure 5-1 Altitude in feet (blue line) and speed in knots (yellow line) for SAR helicopter LN-OIJ (Source: Flightradar24)

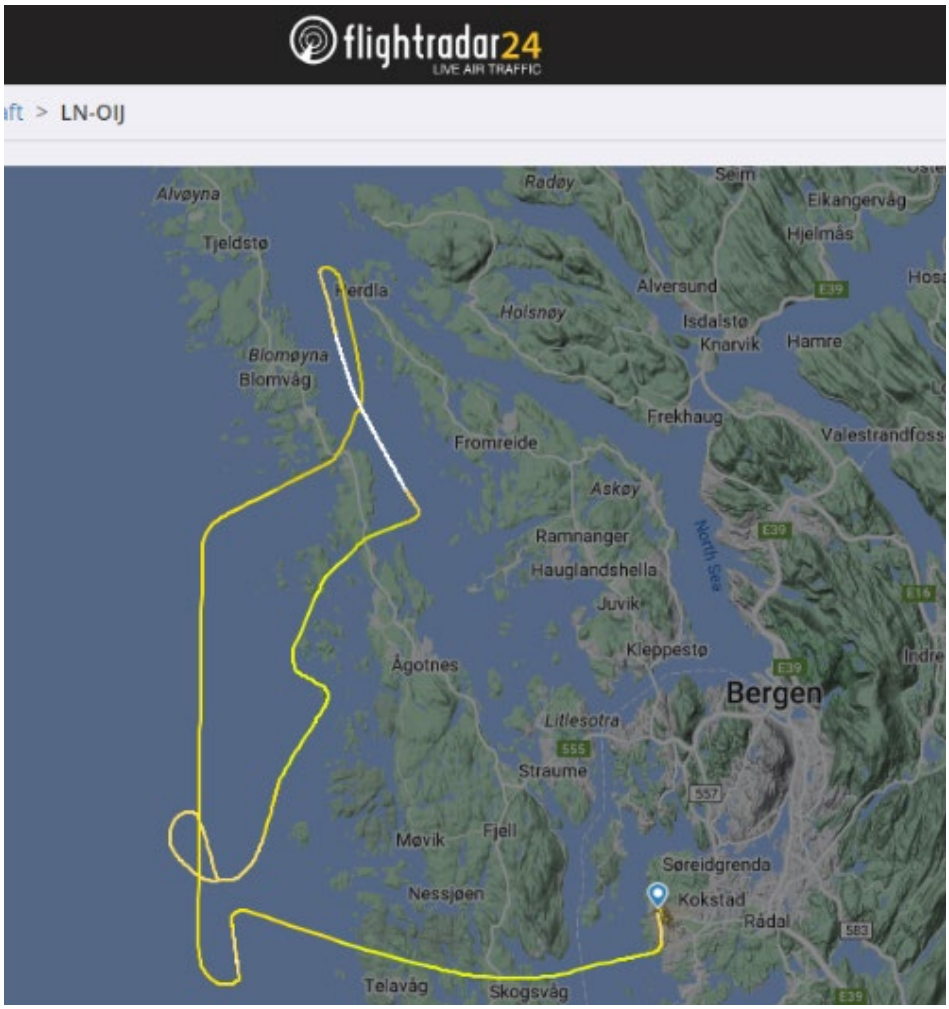

Figure 5-2 Flight route for SAR helicopter LN-OIJ from Flesland (blue symbol). The straight white line indicate that the helicopter maintained a lower speed during a boat exercise (Source: Flightradar24)

5.2 Sequence of events for rescue operation

The sequence of events for the rescue operation carried out by the two SAR helicopters SAR Queen/SAVER50 (operated by the Rescue Helicopter Service at the Air Force's 330 Squadron at Sola) and SAR Florø/LN-OMH/HKSR5C8 (operated by CHC on behalf of the Rescue Helicopter Service) is shown in **Figure 5-3**.

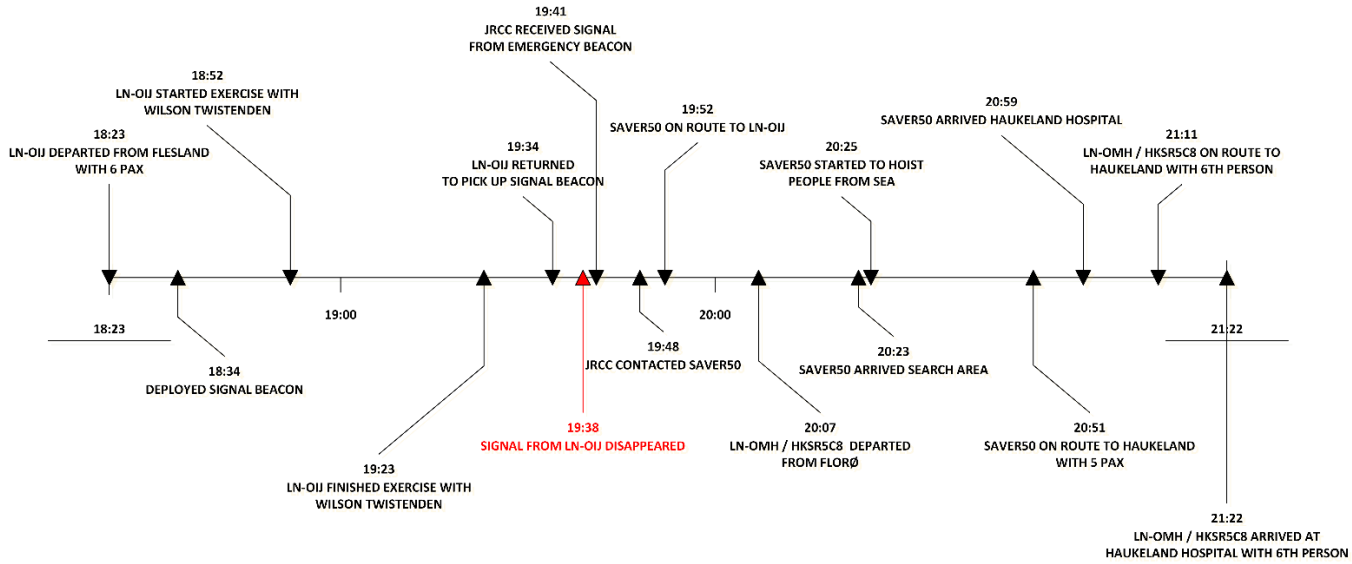

Figure 5-3 Timeline from SAR helicopter LN-OIJ took off from Flesland until the entire crew had been brought to Haukeland Hospital. Data taken from App C

Since the mission of the Joint Rescue Coordination Centre is to rescue people, the rescue operation from their point of view was ended when the entire crew of the SAR helicopter had been transported to Haukeland Hospital. At 21:50, a message was posted on X (Twitter) about this.

Details of the time course of the rescue operation that was controlled by the Joint Rescue Coordination Centre at Sola are shown in table form in **App C**. The various rescue resources that were mobilised are described in more detail in **App D**.

The altitude and speed of the two rescue helicopters are shown in **Figure 5-4** and **Figure 5-5**. Note that here too, one hour must be added to get the local time.

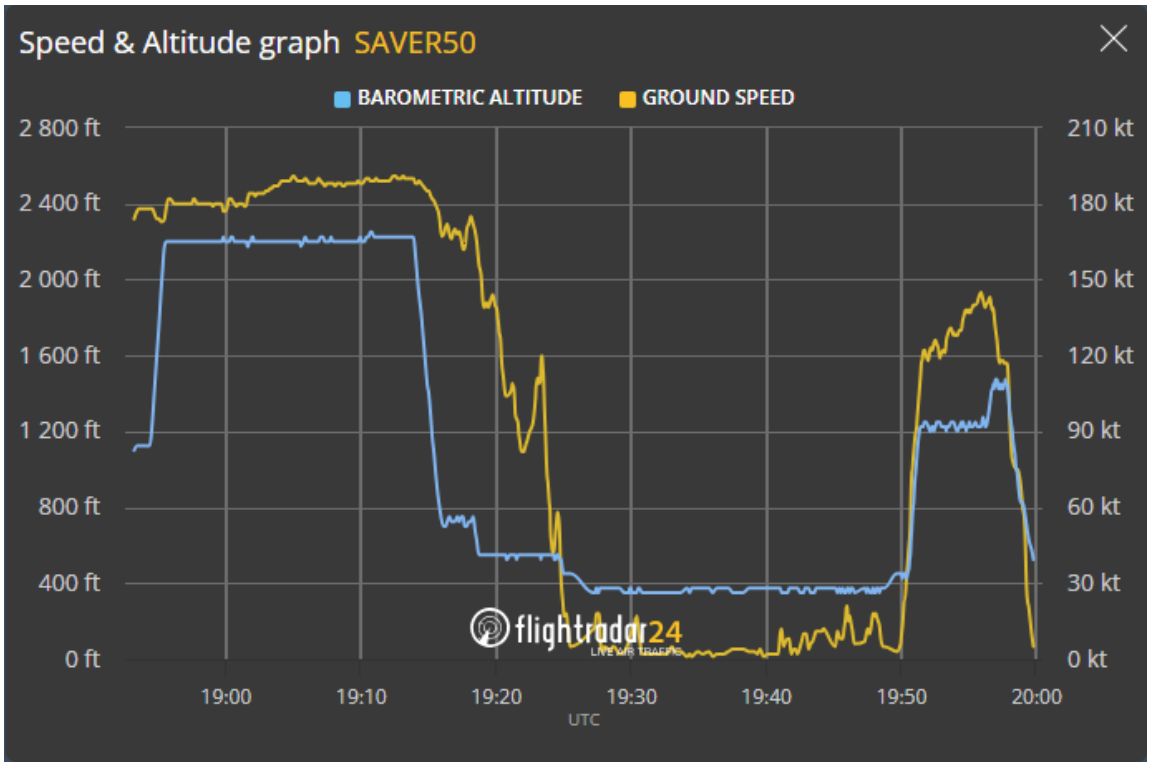

Figure 5-4 Altitude in feet (blue line) and speed in knots (yellow line) for SAR Queen from Sola, SAVER50 (Source: Flightradar24)

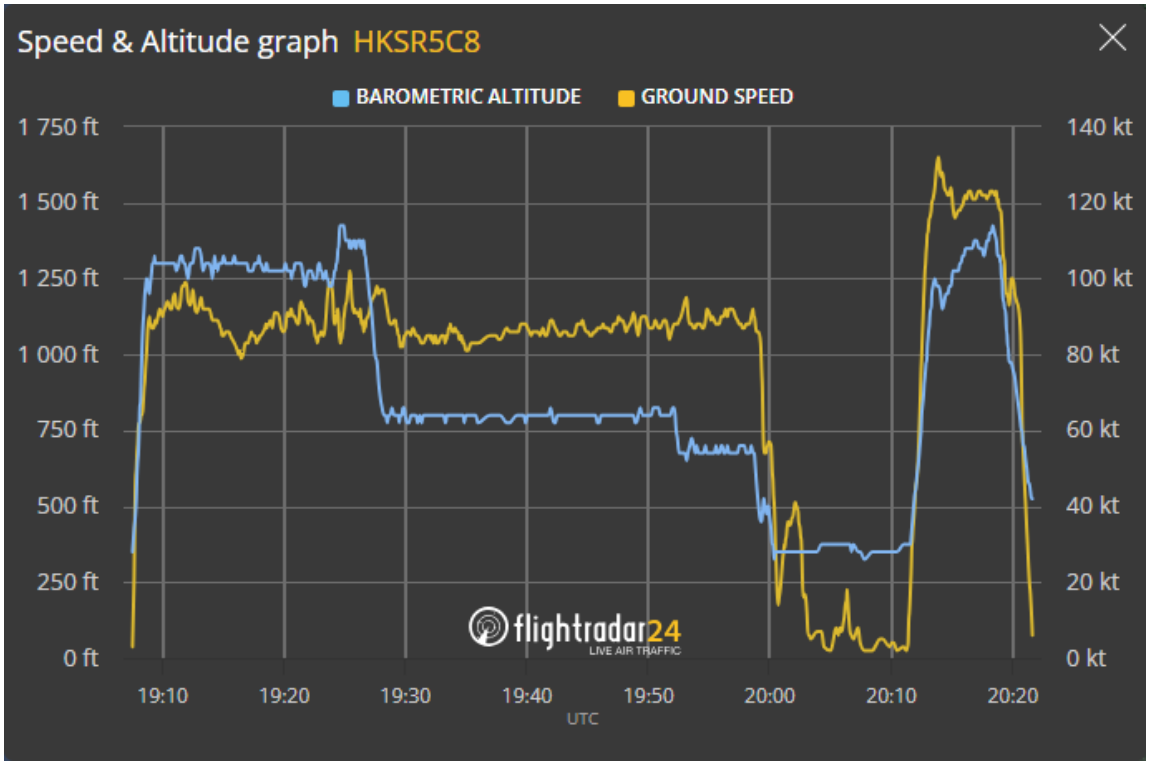

Figure 5-5 Altitude in feet (blue line) and speed in knots (yellow line) for SAR from Florø, LN-OMH / HKSR5C8 (Source: Flightradar24)

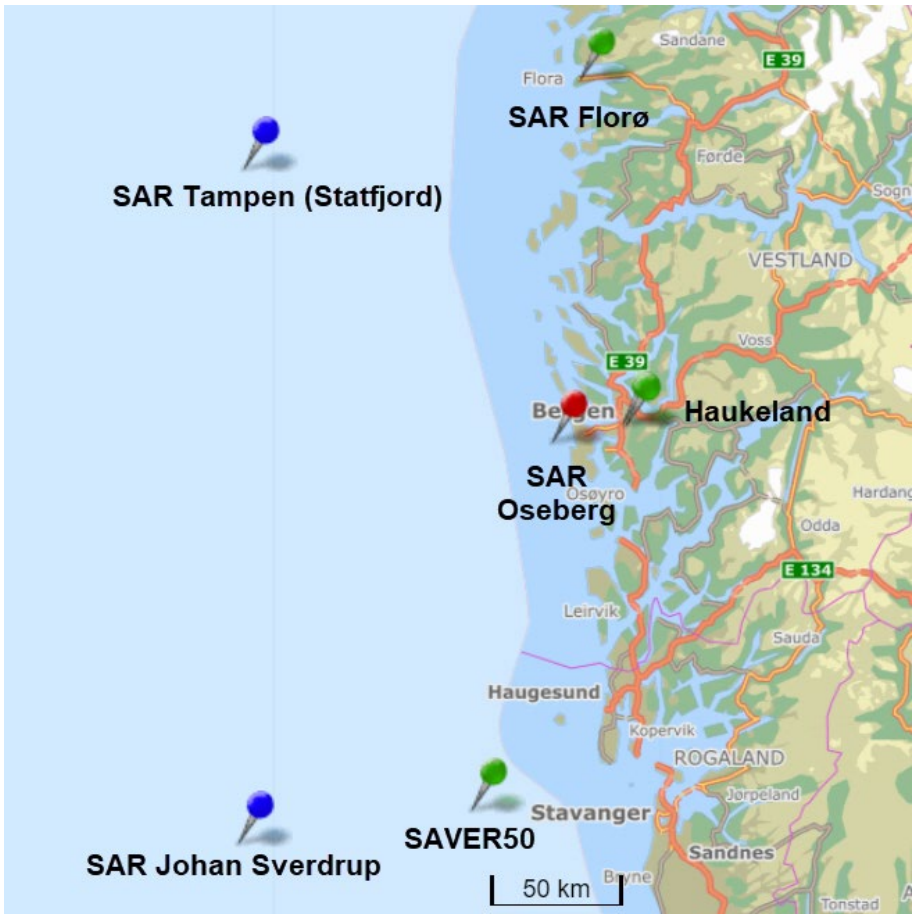

Figure 5-6 Position of Saver 50 (SAR Queen), SAR Florø and Haukeland in relation to the SAR Oseberg accident helicopter at the time of the accident. SAR Tampen (Statfjord) and SAR Johan Sverdrup marked in blue (Source: kart.finn.no)

Corresponding maps with entered times and distances are shown in **Figure 5-7** on the next page. Notice that distances in that figure are distorted. This is because the distance between two circles of longitude (which run from the North Pole to the South Pole) depends on the distance from the equator.

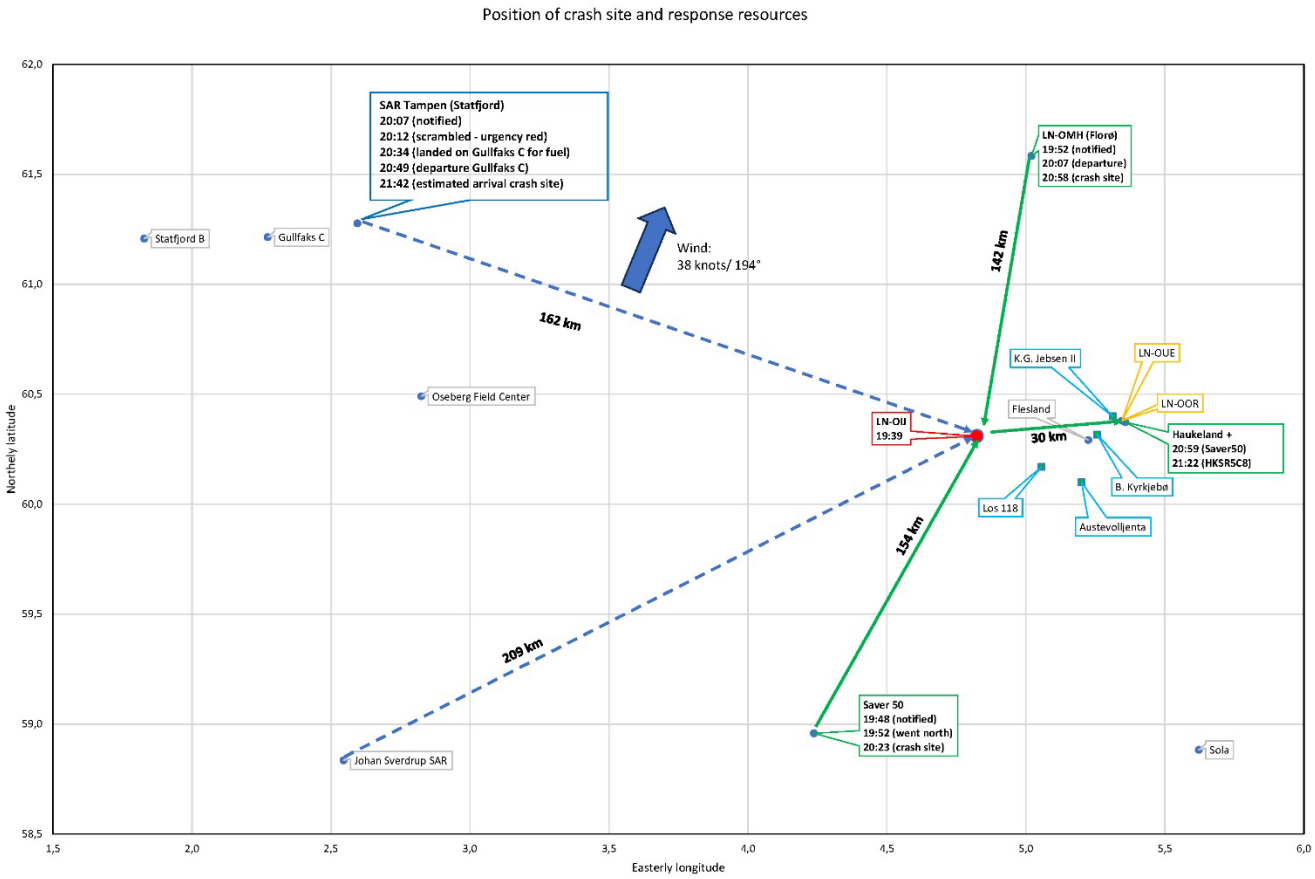

Figure 5-7 Position of various emergency response resources when the helicopter crashed at approximately 19:39 with the time of response

5.3 Equinor's response

5.3.1 Use of Equinor's SAR machine at Tampen (Statfjord)

When SAR Oseberg crashed, SAR Tampen (stationed on the Statfjord B platform) was out on an exercise mission in the area around the Statfjord and Gullfaks fields. Since Equinor's SAR helicopters are not registered with updated information in the computer tool used by the Joint Rescue Coordination Centre for emergency response resources (see **section 3.4.3** on page **22**), this was not known to those who controlled the rescue operation. SAR Queen was contacted by the Joint Rescue Coordination Centre at 19:48, and four minutes later, at 19:52, SAR Florø was alerted. Six minutes after this, at 19:58, a "Mayday Relay" was broadcast from the Coastal Radio, which was picked up by SAR coordinator Oseberg. SAR coordinator Oseberg notified SAR coordinator Tampen at 20:07, who in turn notified SAR Tampen at 20:12. After interrupting the exercise, SAR Tampen flew to Gullfaks C for refuelling before SAR Tampen flew towards the location of the missing helicopter.

A review of the relevant times (taken from **Table 5-1**) shows that the flight time for SAR Tampen from where they were on exercise, and to the location of the missing helicopter, was around 75 minutes (22 minutes flight time from the exercise site to Gullfaks C, 53 minutes from Gullfaks C to location). If SAR Tampen had been alerted at the same time as SAR Queen and had not needed to refuel (this took 15 minutes), it would have arrived at the location at about the same time as SAR Florø.

The sequence of events involving the mobilisation of SAR Tampen is shown in **Table 5-1**. This is based on received logs, FlightRadar24 as well as observations of SAR Tampen on MarineTraffic. SAR Tampen was not visible on FlightRadar24 until 21:06. This was after the helicopter took off from Gullfaks C at 20:49. Reservations are made that the time in the logs may be when the event was **logged**, not when it actually happened.

Table 5-1 Sequence of events mobilisation of SAR Tampen (Statfjord)

Time	Event	Source
19:06	LN-OIM / SAR 111257518 / SAR Tampen visible between Statfjord B and Gullfaks, approx. 10 km east of Statfjord B	Marine Traffic (**Ref /57/**)
19:17	SAR Tampen visible approx. 30 km north-east of Gullfaks C	Marine Traffic
19:38:52	The last recorded signal from SAR Oseberg (LN-OIJ) with call sign NORSAR6 was altitude 400 feet, speed 16 knots, direction 160 degrees	FlightRadar24 (**Ref /56/**)
19:41	The Joint Rescue Coordination Centre Southern Norway at Sola received a report that an emergency beacon has been triggered on an aircraft. The rescue leaders on duty immediately started to check more closely which machine was sending the signal and tried to make contact	Timeline received from JRCC (**Ref /29/**)
19:48	JRCC contacted the SAR Queen rescue helicopter from Sola (*SAVER50*), as they were the nearest rescue helicopter. They were already in the air on a training trip, JRCC informed and asked them to go in the direction of the position outside Sotra they had received from the emergency beacon	Timeline received from JRCC
19:52	JRCC alerted the rescue helicopter in Florø	Timeline received from JRCC
19:54	JRCC asked Coastal radio to send a "mayday relay" to vessels in the area	Timeline received from JRCC
19:57	Bristow OPS called to find out if SAR coordinator Oseberg had contact with NORSAR6. Stated that there has been no contact with NORSAR6	Log SAR-coordinator OSE (**Ref /25/**)
19:58	Mayday Relay on ch.16. Possible missing helicopter	Log SAR-coordinator OSE
19:59	The vessel "Sun Tide" called in and said that they have listened to ch 16 about a missing helicopter east of Kvitsøy. They asked if they should speed up when this position was on their price line. Surveillance and Emergency Preparedness said yes to this	Log from Operation Surveillance and Emergency Response (**Ref /24/**)
19:59	"Sun Tide" recently left the port of Stavanger	Marine Traffic
20:00	The SAR coordinator on duty asked for a colleague on call to come up to the tower. This is to be precautionary	Log SAR-coordinator OSE
20:02	Bristow OPS called and wondered about the departure time for NORSAR6 from BGO	Log SAR-coordinator OSE
20:03	SAR coordinator Oseberg contacted Polaris (Avinor) to hear about the status of NORSAR6. Polaris then informed that SAR-Queen from Stavanger and SAR from Florø were on their way to location	Log SAR-coordinator OSE
20:05	"Sun Tide" called again and said that there was nothing in the area, but out past Sotra that something happened	Log from Operation Surveillance and Emergency Response
20:05	Mayday at Ch.16. The last location for NORSAR6 was west of Sotra	Log SAR - coordinator OSE
20:07	Received a phone call from JRCC regarding a SAR helicopter from Oseberg. Was at training west of Bergen, lost contact with helicopter, received a distress signal from PLB. -Air ambulance on the way. -SAR Florø on its way -SAR Sola on its way. -Pilot helicopter on the way. They did not want assistance from Equinor in the first instance	Log from Operation Surveillance and Emergency Response
20:07	SAR coordinator Oseberg informed SAR coordinator Tampen that NORSAR6 was missing. SAR Tampen, who was in training, was sent to the location. They had to stop by Gullfaks C for fuel	Log SAR-coordinator OSE

Time	Event	Source
20:07	The OSE SAR coordinator called and reported that SAR Troll/OSE was missing west of Sotra. Last position N60.18. E004.44	Log Offshore Air Tampen (**Ref /26/**)
20:11	The OSC (Operation Section Chief) informed the Emergency Response Commander (IC) of the IMT/2nd line immediately	Log from Operation Surveillance and Emergency Response
20:12	SAR Tampen out on training flight was called on the company channel and briefed. They finished training and headed for Gullfaks C to refuel	Log Offshore Air Tampen
20:12	SAR Tampen scrambled with urgency Red	Log Offshore Air Tampen
20:15	Loging number 182670 enabled by SAR - Coordinator Tampen	Log Offshore Air Tampen
20:18	The incident commander 2nd line called. They have received a report from JRCC about a missing helicopter. SAR coordinator Oseberg gave the status and the information they had	Log SAR-coordinator OSE
20:23	SAVER50 arrived at the search area	FlightRadar24
20:23	Log number 182671 enabled by Monitoring and Emergency Preparedness	Log from Operation Surveillance and Emergency Response
20:23	Saw on Flightradar24 that SAR-Queen had arrived at location	Log SAR-coordinator OSE
20:24	SAR Tampen visible north-east of Gullfaks C, 5 km south of its position at 19:23	Marine Traffic
20:25	SAVER50 started hoisting people up from the sea	
20:26	SAR Tampen visible 10 km east-northeast of Gullfaks C, heading towards Gullfaks C	Marine Traffic
20:26	Captain of SAR Tampen asked for blankets/hypothermia equipment	Log Offshore Air Tampen
20:27	A nurse on board Gullfaks C was informed and asked to prepare equipment. The platform only had carpets	Log Offshore Air Tampen
20:30	SAR Tampen visible approx. 500 metres north-west of Gullfaks C, heading towards Gullfaks C	Marine Traffic
20:31	Platform manager Gullfaks C entered the room and was briefed on the situation	Log Offshore Air Tampen
20:34	SAR Tampen landed, refuelled, and the Captain stopped by Offshore Air Tampen for briefing and planning	Log Offshore Air Tampen
20:40	Supervisor Polaris (Avinor) informed that SAR-Queen (SAVER50) had started hoisting from the sea	Log SAR-coordinator OSE
20:47	A SAR nurse on Statfjord B telephoned Offshore Air Tampen with information that the Statfjord B helicopter deck crew had been notified of the incident and the assignment	Log Offshore Air Tampen
20:49	SAR Tampen took off from Gullfaks C	Log Offshore Air Tampen
20:49	SAR Tampen visible approx. 500 metres south of Gullfaks C, heading towards land (Flesland)	Marine Traffic
20:50	The estimated time of arrival for the search area is 21:42. Information forwarded to Polaris (Avinor)	Log Offshore Air Tampen
20:59	SAVER50 arrived at Haukeland Hospital	FlightRadar24
21:03	SAR Florø reduced speed to 5 knots, altitude still 350 feet	FlightRadar24
21:04	SAR Florø at the crash site. (Flightradar24)	Log SAR-coordinator OSE
21:05	SAVER50 left Haukeland Hospital	FlightRadar24
21:10	Various reports via newspapers/X show that the missing helicopter has been located and the personnel who were on board are in the process of being picked up by other resources	Log Offshore Air Tampen

Time	Event	Source
21:11	SAR Florø increased speed from 2 knots to 132 knots, and altitude from 375 feet to 1225 feet, set course for Haukeland Hospital	FlightRadar24
21:19	Coastal radio Sør reported Mayday Seelonce Feenee on ch.16. (*This opened the way for channel 16 to be used normally again*)	Log SAR-coordinator OSE
21:22	SAR Florø landed at Haukeland Hospital	FlightRadar24
21:51	SAR Tampen landed at Flesland	FlightRadar24

5.3.2 Next-of-kin, SAR nurses and offshore employees

An excerpt of Equinor's response in relation to the next of kin and work colleagues of the SAR nurse is shown in the table below.

Through conversations with the relatives and the responses to the survey sent to the SAR nurses, the investigation team believes that the support provided by Equinor has been important, and that it has been well received. A review of registered digital observation cards in the Synergy database shows generally positive feedback from employees offshore, especially in relation to information provided by helicopter pilots before departure, and from health personnel/platform managers on board.

Table 5-2 Sequence of events for contact with next of kin (Names of persons removed)

Time	Event	Source
28.02.2024 21:17	The next of kin telephone is open, operated by the on-call PSS (Personnel Support Supervisor)	CIM log 2. line response (**Ref /27/**)
21:32	The next of kin phone connected and opened at 9.28 p.m. Equinor's switchboard closed at 21:00. On the provider side for Bristow and JRCC, especially with Call Center	CIM log 2. line response
21:35	The doctor on duty spoke to a contact in Bristow. They have been told that the police must inform the next of kin	CIM log 2. line response
21:36	Contacted Equinor's call centre and informed them that Equinor was going to go out with the next of kin phone number and that several phones had been connected	CIM log 2. line response
22:07	Crew on board: 6 confirmed. 2 critically injured, 4 uninjured. All six were at Haukeland. Call center open. Police wanted to call relatives	CIM log 2. line response
22:20	Contact the control centre with information that Equinor has opened a telephone number for relatives and that the control centre can provide a telephone number if someone calls	CIM log 2. line response
22:20	IC (*Incident Commander*) and AOBD (*Air Operating Branch Director*) talked to the Western Police District about Bristow being able to notify his relatives	CIM log 2. line response
22:29	A next of kin centre was established at Haukeland Hospital by Haukeland	CIM log 2. line response
22:29	Clarified with Bristow that they have not established a next of kin center, other than the one at Haukeland. Bristow has set up a next of kin telephone	CIM log 2. line response
22:40	The Result Area Manager (RO Manager) for Operations West was contacted to provide a representative at the next of kin center Scandic Kokstad	CIM log 2. line response
22:53	Create next of kin rooms at Haukeland. The police are setting up a next of kin centre at Scandic Kokstad. Equinor is doing this in collaboration with the Police	CIM log 2. line response
22:54	Informed Bristow that Equinor is setting up a next of kin centre together with the police at Scandic Kokstad	CIM log 2. line response
23:00	Notification by the Centre for Crisis Psychology. Psychologist will be at next of kin reception Scandic Kokstad tonight	CIM log 2. line response
23:12	It has been agreed that the RO manager will send up the manager representatives of Operation Manager Oseberg and Operation Manager Gullfaks to the next of kin centre at Scandic Kokstad, which the Police have taken the initiative to establish	CIM log 2. line response

Time	Event	Source
23:33	The doctor on duty spoke to a nurse who is on his way to the next of kin centre. Informed about the case	CIM log 2. line response
23:34	One person dead, next of kin are notified before the police go out to the media	CMT log 3. line response (**Ref /28/**)
29.02.2024 00:13	Next of kin centre at Scandic Kokstad established together with the Police and Bristow	CIM log 2. line response
00:30	The police sent out a press release to the media stating that one person has died	CMT log 3. line response
00:42	CEO and Executive Vice President EPN will travel to Bergen on 29 February. Equinor keeps its next of kin phone overnight	CMT log 3. line response
29.02.2024 00:58	The police want to set up a call center. Haukeland has opened its call center. Bristow personnel are standing at the Heliports. Equinor provides personnel at the Heliports and except for Brønnøysund. Key union representatives are continuously informed	CMT log 3. line response
02:25	The police have scaled down to two people who will staff the Next of kin center and the next of kin hotline throughout the night. The police are expected to close down their part of the next of kin center at 09:00 on 29 Feb.	CIM log 2. line response
08:33	Assessments will be made during the day how long the next of kin centre will be kept operational, Bristow has its own centre in its own premises	CIM log 2. line response
10:02	Assessments will be made how long the next of kin center will be operational later today. The CEO is on his way to Bergen. Information to the personnel standing at the Heliports has gone out. There will be town hall meetings on installations. Regular meetings have been set up in the future with the union representatives.	CMT log 3. line response
10:59	Support Oseberg and health personnel. Clarify the need for support at heliport Brønnøysund	CIM log 2. line response
13:28	Information about the seamen's chaplains: A total of four, to the next of kin centre, Gullfaks B and two to Oseberg	CIM log 2. line response
18:57	Then it is heading towards closing the next of kin center. The relatives have gone home. Only PSS and management representative left. Closes when seamen's chaplain returns from Haukeland	CIM log 2. line response
19:47	Next of kin centre Scandic Kokstad has now closed.	CIM log 2. line response
01.03.2024 17:44	The following was published on Equinor's internal website (Insight): On Friday 1 March, the police confirmed the name of the SAR nurse who died in the helicopter crash outside Bergen. "Our thoughts are first and foremost with family and friends, who have lost their loved one in this tragic accident. At Equinor, we mourn the loss of a close and dear colleague. We express our deepest condolences to family and friends during this difficult time," says Equinor's CEO. The SAR nurse is described by her close colleagues as a highly skilled and steady SAR nurse with a high level of personal integrity, humble, caring and tough at the same time. Colleagues point out that she always took the time to help others when they needed it. She was someone who was listened to, and someone who many felt they could confide in. She worked as an SAR nurse and was on board the crashed SAR helicopter. The accident occurred on Wednesday evening, 28 February, while the helicopter, which was attached to the SAR service for the Oseberg area in the North Sea, was on a training mission for Equinor. She was a trained nurse anaesthetist with special expertise in search and rescue. She has been employed by Equinor since 2002. She has previously worked as a nurse on the installations Grane and Troll C. From 2009 she worked as an HSE coordinator and SAR nurse at the Oseberg Field Centre. She leaves behind her partner, daughter, son-in-law and two grandchildren. This text has been prepared in agreement with the next of kin.	https://insight.equinor.com/CorporateNews/166547/20230228-helicopter-incident-outside-bergen

Time	Event	Source
03.03.2024 17:15	Update on Equinor's internal website (Insight): Many are affected by the very serious accident with the SAR helicopter, in which our dear colleague lost his life. We have mobilised to follow up on relatives, those involved and our travellers," says Head of Joint Operations Support at DPN. The helicopter that went down in the North Sea on 28 February was on a training mission and was attached to the SAR service for the Oseberg area in the North Sea. It is Bristow that operated the helicopter and the Joint Rescue Coordination Centre led the rescue operation. During the incident, Equinor mobilised the emergency response organisation to provide support in this work. -We have a close dialogue with relatives and those involved to provide the support we can. At the same time, we are working to take care of our people in the best possible way, and to ensure the safety of everyone who has their way to work by helicopter on the Norwegian shelf," says head of the follow-up work.	https://insight.equinor.com/sites/exploration-and-production-norway/News/166801/oppfolging-helikopter

5.3.3 Temporary halt in helicopter traffic

Equinor's handling of temporary suspension of helicopter traffic is shown in **Table 5-3**. The time in the table can be when the information was logged, and not necessarily when events occurred. *Text in italics is clarifications made by the investigation team.*

Through interviews, the investigation team perceives that it would have created greater security, calm and predictability for both passengers, their families, the helicopter operators and Lufttransport if a longer stop had been decided at the first decision, only 2.5 hours after the accident.

See **App G** for information that passengers were sent when helicopter traffic was running as normal again.

Table 5-3 Sequence of events for cessation of helicopter traffic (Names of persons and other oil companies removed)

Time	Event	Source
28.02.2024 21:58	All helicopter traffic (*for Equinor in Norway*) will be stopped until 13:00 tomorrow	Log for CMT (3. line) (**Ref /28/**)
23:16	Flight Safety is considering stopping delivery helicopters until 13:00 tomorrow (29.02.2024)	Log for IMT (2. line) (**Ref /27/**)
23:20	Halt in Equinor's helicopter traffic until 1300 tomorrow (29.02.2024). A new assessment of the situation is then made. Briefing Offshore Norge in relation to the shutdown of Equinor's helicopter traffic	Log for CMT (3. line)
23:23	Helicopter traffic has been stopped – BC (*Business Continuity*) in the line is following up. Assessing helicopter traffic – Head of JOS BC in the line follows up. Consider whether to have personnel at the Heliport to receive personnel coming in from installations when the helicopters get going again. This is taken in PO (*Personnel and organization*) EPN	Log for CMT (3. line)
23:36	Equinor has no information on causal factors, but considering tonight's serious incident, Equinor will suspend all our flyer flights on the Norwegian continental shelf until 1 p.m. on 29 February	Log for IMT (2. line)
29.02.2024 00:30	Message to tomorrow's passengers has been sent out via DaWinci, all helicopter traffic is held until 13:00, new information will be provided at 12:00	Log for IMT (2. line)
00:40	Bristow personnel are present at the Heliports. Equinor deploys personnel at the Heliports except for Brønnøysund	Log for CMT (3. line)
00:58	S92 flights from Aberdeen will also be stopped tomorrow, a decision they have made themselves in Aberdeen	Log for CMT (3. line)

Time	Event	Source
29.02.2024 09:20	Information that can be used on the heliports: Status at 09.15 29.02.2024. Equinor, like other offshore operators, has chosen to postpone all crew changes with the S92 helicopters until 1 p.m. on Thursday. That means all flights, as the S92 is the only helicopter type Equinor uses for flyer flights. This is happening as a result of the accident with the SAR helicopter outside Bergen last night. Safety trumps all other considerations. The stay in the flights is done so that the professionals who will assess whether it is safe to fly have time to assess this thoroughly. If Equinor and the helicopter companies decide to resume flights, everyone who travels out would receive information at the "gate" from representatives from the helicopter companies. Here it will also be possible to ask questions. If asked: The SAR helicopters will continue to fly when needed. This means that if someone falls ill offshore, they will be flown ashore in the normal way.	Log for IMT (2. line)
10:27	*Another operating company* has asked for a contact person in Equinor. They are considering suspending all flights for the rest of the day. *NN* is the contact person for *the company*. He has the dialogue with them and reports back after *the management meeting in Logistics and Emergency Response* now	Log for IMT (2. line)
11:23	The Business Continuity team[2] has postponed the start of transport traffic until 6 p.m.	Log for IMT (2. line)
11:56	Equinor is initially postponing the flight program in Norway until 18:00 tonight on the basis that the NSIA will have time to assess the situation. The NSIA will arrive in Bergen at 12 noon today and will work throughout the day. Equinor is working closely with Bristow on today's and tomorrow's flight program. In respect of the incident in Norway, Equinor's flights in the UK and Canada have also been paused until further notice to create calm in the various helicopter companies	Log for IMT (2. line)
12:03	Due to late departures, Operation Air will start cancelling departures that will not be carried out today	Log for IMT (2. line)
12:50	Brief contact *with the duty officer in the Civil Aviation Authority to* clarify whether there is any expectation from the Civil Aviation Authority of Equinor. No expectations as the duty officer sees it. It is emphasised that the decision to stop flights did not come from the Civil Aviation Authority, but that it was the operators who decided to do so	Log for IMT (2. line)
13:59	All flights are suspended until further notice Equinor is initially postponing the flight program in Norway until Thursday at 18:00 on the basis that the NSIA will have time to assess the situation. The stay in the flights is done so that the professionals who are to assess whether it is safe to fly have time to assess this thoroughly. If Equinor and the helicopter companies decide to resume flights, everyone who travels out would receive information at the "gate" from representatives from the helicopter companies. Here it will also be possible to ask questions. Equinor is working closely with Bristow and CHC regarding the flight programme going forward. Equinor has also suspended its flights in the UK and Canada until further notice. The cause of Wednesday's tragic accident is still unknown. The emergency response organization at Sandsli is still mobilized	Log for IMT (2. line)

[2] The log describes that the decision was made by the BC team. The investigation team believes this is a misunderstanding, since the BC team does not have decision-making authority on behalf of the risk owner but is only supposed to give advice. In this case, it was the leader of the JOS who was appointed as the leader of the BC team, and the person in question confirmed to the investigation team that the decision to temporarily suspend helicopter traffic was made as the leader of the JOS

Time	Event	Source
29.02.2024 17:39	All flights to and from the Norwegian continental shelf have been suspended until Friday 1 March at 10.00 a.m. All flights have been postponed until further notice Equinor is initially postponing the flight program in Norway until Friday at 10:00 a.m. to give the NSIA, the Civil Aviation Authority of Norway, Flight Safety, Bristow and others time to assess the situation. When Equinor, together with the helicopter companies, decides to resume flights, everyone who travels out will receive information on the "gate". Here it will also be possible to ask questions. Equinor is working closely with Bristow and CHC regarding the flight programme going forward. Equinor has also suspended its S-92 flights in the UK, Brazil and Canada until further notice	Internal website in Equinor
01.03.2024 11:17	Equinor, in consultation with the Civil Aviation Authority of Norway, has decided to resume flights with Sikorsky S-92 to the installations on the Norwegian continental shelf. After the tragic helicopter accident on Wednesday evening, the major operators on the Norwegian shelf chose to take a break in all flights to and from installations on the shelf in order to get the necessary overview. Equinor has used the time to take care of the next of kin, review the situation and make the necessary clarifications with the authorities and the aviation safety professional communities, so that a resumption of flights can take place in a safe manner. The Search and Rescue Service (SAR) has been operational throughout the period. "This serious incident affects us all. Flight safety and the safety of everyone who travels by helicopter are fundamental to our business. Based on dialogue with the Civil Aviation Authority, there are no indications that helicopter safety on the Norwegian shelf has been impaired," says executive vice president for Exploration & Production Norway. A decision on the resumption of flight is a work coordinated between the aviation authorities, helicopter operators, trade unions and operating companies. Based on this work, all the companies, coordinated through Offshore Norge, have now decided to resume their flights. "The unions and the Safety delegates are satisfied with the information we have received along the way. We think it was right to introduce a pause in flights after the accident. When the authorities and other professional communities say that it is safe to start up with ordinary transport services, we must have great confidence in them, and the decisions that have been made," says the coordinating main safety delegate for Equinor on the Norwegian continental shelf on behalf of trade unions and the safety delegates	Internal website in Equinor

5.3.4 Assistance to the NSIA

Equinor was in contact with the Norwegian Safety Investigation Authority to assist with resources to raise the crashed helicopter. The procedure is shown in **Table 5-4**.

Table 5-4 Sequence of events raising the crashed helicopter

Date Timet	Event	Source
29.02.2024 14:58	Call back to the Norwegian Safety Investigation Authority (NSIA) for an update on obtaining a resource for searching for wrecks	Log from IMT (2. line) (**Ref /27/**)
16:00	Meeting between Equinor and NSIA regarding the raising of the helicopter. Participants from NSIA: the head of the investigation and the deputy commander of the investigation, two from the Maritime Department, as well as the head of the NSIA. Five people from Equinor. The responsibility for the operation lies with NSIA. Equinor offers to release resources ("Normand Ocean", "Edda Freia") on the market. The NSIA contacts the shipping company Deep Ocean directly and enters into an independent contract. NSIA reports that they have been in contact with "KV Sortland" (*KV = Coast Guard*), which is on its way to the presumed accident site to conduct a search for the casualty. Equinor offers to check with Area Emergency Response Vessel "Stril Herkules" whether they have equipment to assist with the search for the casualty. Equinor checks with "Stril Herkules" and puts them in touch with the Maritime Department if they can assist. Equinor is establishing contact with the Maritime Department regarding the release of the "Normand Ocean". Arranged a new status meeting with NSIA at 18:00	Log from IMT (2. line)
18:00	Meeting between Equinor and NSIA. Participants from NSIA: investigation manager, secondin command, investigation manager, two from the Maritime Department. Four people from Equinor. Equinor has released "Normand Ocean" and NSIA is now free to sign a contract with the company Deep Ocean if this is the vessel they want to use. NSIA now takes responsibility for searching and lifting up the casualty. NSIA informed that they had information that the helicopter sank quickly, and believed they had an idea of the search area. They also reported that debris had been found, here a door was mentioned, parts from probably a rotor blade, a helmet. NSIA had been in contact with "KV Sortland", and they wanted to start a search with a hydrophone. Equinor informed that NSIA could contact Equinor Marin if they wanted any more information	Log from IMT (2. line)
01.03.2024 19:00	"Normand Ocean" arrives at the scene of the incident	Marine Traffic (**Ref /57/**)
20:15	NSIA has contracted an offshore vessel to continue the search and then raise. The wreck was located near the search position at approximately 20.15 at a depth of approx. 220 m.	NSIA Air, investigation 24-023 (**Ref /44/**)
02.03.2024 05:00	NSIA filmed the helicopter raise	NSIA Air, investigation 24-023
05:53	The "Normand Ocean" left the scene of the incident, set course for the Navy base Haakonsvern with the crashed helicopter	Marine Traffic
08:29	«Normand Ocean» arrives at Haakonsvern with the crashed helicopter	Marine Traffic
10:15	«Normand Ocean» left Haakonsvern	Marine Traffic

5.3.5 Business Continuity

There was a gradual transition from CMT's (3rd line emergency response) handling of the incident to the Business Continuity team (BC team). For further explanation about BC teams, see **section 3.2.6** on page **17**. Head of EPN JOS who originally held the role of Head of CMT was appointed by Executive Vice President EPN to lead the BC team. CMT and BC leader worked in parallel with their respective tasks until the morning of 29.02.2024 when a formal mandate was made for the BC team. The main activities for the initial period are shown in **Figure 5-8** below. On 07.03.2024, the SSU leader in EPN took over as leader of the BC team.

The investigation team has received a joint action list from the head of the BC team. As of 04.04.2024, a total of 139 actions were defined among 24 responsible parties, of which 133 actions had been reported.

The investigation team has also received an evaluation after a meeting for the BC team that was held on 19.04.2024.

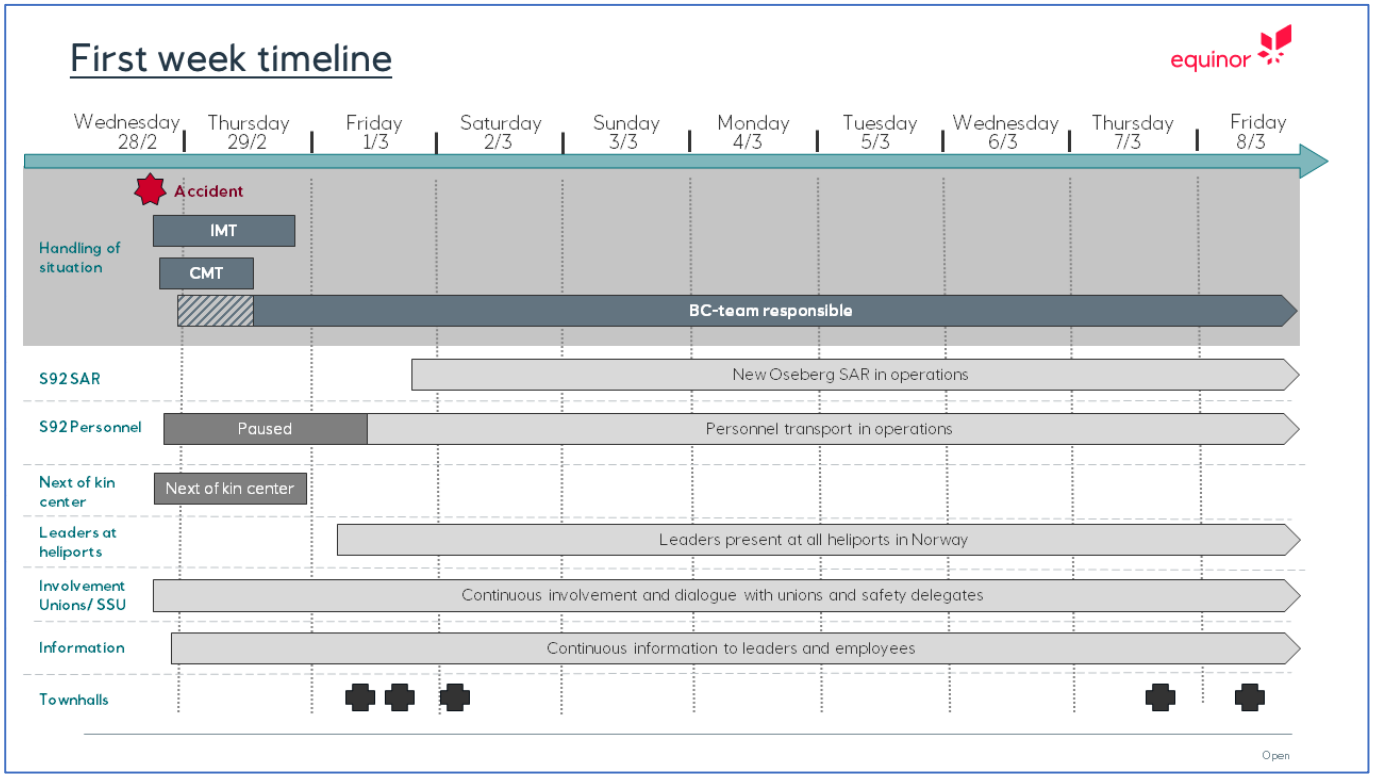

Figure 5-8 Timeline for work in the BC team during the first week (Source: received by email from BC team leader)

6 The NSIA's work on causal analysis

As described in the mandate (**App A**) and delimitations (**section 2.2** on page **5**), the investigation team shall not go into the causes of the helicopter accident. This will be part of the NSIA's investigations and probably also the helicopter company Bristow's own investigation. On 05.03.2024, the NSIA announced that data from the flight recorder in the helicopter had been retrieved, and that the work of analysing the data was underway, but that it was expected to take a long time (**Ref /44/**).

The update published by the NSIA dated 08.03.2024 (**Ref /44/**), is shown below:

> *"It is still the early phases of the investigation. The NSIA has interviewed the five persons who survived the accident. This, together with analysis of data from the Flight Data Recorder, is important information to understand how the accident could happen. The NSIA maintains a good dialogue with all involved parties. All findings related to aviation safety will immediately be forwarded to the CAA Norway and to EASA. The National Transportation Safety Bureau has appointed an accredited representative.*
>
> *So far no significant findings impacting aviation safety has been found.*
>
> *The investigation will also look into survival aspects. Helicopter systems, crew equipment, evacuation possibilities and the rescue operation will be investigated.*
>
> *The helicopter was equipped with emergency floats. These were armed, but did not deploy automatically. The floats are designed for a controlled emergency landing in water. Even though the accident appear to be a relatively low energy impact, it can not be called a controlled emergency landing. The fact that the floats did not deploy can be because the situation that occurred was outside the limitations of the system. The NSIA can therefore not state that there were any technical faults with the flotation system."*

On 13.05.2024, the NSIA published a new update on the cause of the accident on its website (**Ref /44/**):

> *"The accident happened in the evening of 28 February 2024. The helicopter took off from Flesland (ENBR) to carry out SAR training. There were six people on board the helicopter; two in the cockpit, two winchmen, a winch operator and a nurse. A training Emergency Position-Indicating Radio Beacon (EPIRB) was dropped into the sea west of Sotra, which was later to be searched for. The flight then continued in a northerly direction to Hjeltefjorden to practice winch operations with the ship Wilson Twisteden. After the winch operations, the course was set towards the beacon.*
>
> *The crew was about to position the helicopter to retrieve the beacon when the accident occurred. It was dark with few external visual references. The wind was southerly at about 35 kt. The flight was carried out according to Visual Flight Regulations (VFR) without the use of Night Vision Goggles (NVG). The crew had activated the mode Mark on Top (MOT) of the Automatic Flight Control System (AFCS). This mode is only installed in SAR-helicopters. Analysis of data from the Flight Data Recorder (FDR), HUMS information and data from the Flight Control Computer (FCC) indicates that the pitch attitude started to increase abnormally when the helicopter was near the training beacon (150 ft radio altimeter altitude and speed decreasing to near 10 kt). The nose of the helicopter started to rise from the expected 10°–12° nose up attitude to a 30° nose up attitude over several seconds. When the crew became aware of the situation, they attempted to correct the unusual attitude however the aircraft impacted the water and sank to a depth of 220 metres. The NSIA is working to determine the cause of the pitch up manoeuvre."*

In the same update on 13.05.2024, the NSIA described more details about the rescue operation (**Ref /44/**):

> *"Two different rescue helicopters retrieved the six people from the accident helicopter from the sea and transported them to Haukeland University Hospital in Bergen. One person was found floating without a deployed life jacket and any sign of life when the first rescue helicopter arrived at the accident site. Life jackets used in*

helicopters must be deployed manually. It was therefore prioritized to pick up the five survivors. The situation for one of the survivors became critical and the helicopter was consequently unable to pick up the person without any life signs. The person without any life signs was picked up by the second rescue helicopter which arrived somewhat later. The investigation also includes survival possibilities. This includes, among other things, the helicopter's emergency equipment such as flotation elements and rafts, the possibility of evacuation and the rescue operation itself and the crew's personal equipment. This includes emergency breathing apparatus, life jackets with lights, personal locator beacon and survival suits."

Nor did the NSIA issue safety recommendations at the update on 13.05.2024 (**Ref /44/**):

"The NSIA has not made any unequivocal findings that are believed to affect immediate flight safety. Any safety findings of importance will be immediately notified to the European Aviation Authority, the Norwegian Civil Aviation Authority, the manufacturer Sikorsky and the operator Bristow Norway."

7 Follow-up after the Turøy accident 29.04.2016

The work process for accident investigations, INV101, describes in the standard report template that the investigation team must search for previous similar incidents and causal factors. Since the causes of this accident will not be available until the NSIA has completed its work, this is not yet possible.

In the mandate for the investigation, it is specifically mentioned that the investigation group will investigate the follow-up of measures taken after the Turøy accident.

On its way from Gullfaks B to Flesland on the morning of 29.04.2016, an Airbus 225 helicopter (Super Puma) crashed near Turøy. The helicopter was operated by CHC Helikopter Service. On board the helicopter were 11 passengers and two pilots. All perished. The accident was investigated by the NSIA (**Ref /42/**).

An internal investigation team was appointed in Statoil with the following mandate (translated excerpt):

> Statoil's investigation team will conduct a review of the following matters of importance to the safety of Statoil's helicopter operations on the Norwegian continental shelf:
>
> - Statoil's emergency response to the accident, including interaction with authorities and partners
> - Statoil's organisation and activities related to helicopter services, including roles and responsibilities between Statoil, helicopter operators and other players involved in the operation and maintenance of helicopter operations for Statoil on the Norwegian continental shelf
> - How helicopter incidents are followed up by Statoil and its suppliers
>
> Based on its review, the investigation team will provide its observations and recommend actions to strengthen Statoil's work on helicopter safety and accident response.
>
> If, in connection with its work, the investigation team discovers conditions that are critical to safety, the chief executive officer shall be informed immediately.

Figure 7-1 Excerpt of the mandate for Statoil's internal investigation of the Turøy accident (Ref /41/)

The investigation report was submitted on 20.09.2016 (**Ref /41/**). Two years after the accident, a Cold Eye Review (**Ref /43/**to examine how the proposed measures from the company's investigation report, as well as the line's own improvement proposals, had been followed up. The conclusion of the verification report was:

> *The verification team concludes that the improvements proposed by the COA (Equinor's corporate audit) and DPN (Operations and Production, Norwegian continental shelf) have been addressed and have strengthened the company's work on aviation safety, as well as improved some details in emergency management. We are of the opinion that aviation safety has been prioritised and clarified through new organisation and strengthened management. The Aviation Logistic Team, which was established in early autumn 2017, is an important arena for interaction and learning.*

The verification report has nevertheless listed two points that are classified as yellow findings (action is required), and a further seven green points (action is to be considered).

> *The verification team is of the opinion that the company's definition of liability could have been more clearly described. We perceive that the placement of the flight safety function in DPN JOS's organization of flight safety work is good and clear. However, we have not been able to document that descriptions of the many interfaces related to flight services and flight safety are sufficiently clear.*

Through interviews, the investigation team perceives that there are still interfaces related to flight services and flight safety that are not sufficiently clear.

The investigation team has reviewed the proposed measures in the actual investigation report for the Turøy accident, in addition to examining how the recommendations from the verification report have been followed up. All measures and recommendations are closed. For some of the measures in the investigation report following the Turøy accident, there is a lack of documentation to be able to assess whether the long-term effect of the measures has been achieved.

The yellow recommendations from the verification report have partly documented follow-up, without it being clear how the recommendation was handled and closed.

8 Consequences

Based on collected facts and *WR9592 – Record safety and security incidents* (**Ref /16/**), the actual consequences of the incident have been mapped and an assessment has been made of possible consequences under slightly changed circumstances. The consequence assessment is not linked to the findings made by the investigation team but is a consequence assessment of the incident itself. Although it is outside the mandate of the investigation team to determine the cause of the accident, the consequences can be described without linking this to the cause and in accordance with the mandate to conduct an investigation in accordance with the work process for accident investigation, INV101.

8.1 Actual consequences

There were six people in the SAR helicopter during the accident: two pilots, two rescuers, an elevator operator/mechanic and a SAR nurse. The SAR nurse died. Haukeland University Hospital reported at 09:10 on 29.02.2024 that there was one critically injured, one seriously injured and three slightly injured (**Ref /85/**).

8.2 Potential consequences

The investigation team has assessed the potential consequences for the incident based on what could have happened under "slightly different circumstances".

Fact box 8-1 Explanation of "slightly different circumstances"

"Slightly different circumstances" means that it is only by chance that alternative outcomes of the incident did not occur, and not what could have happened in worst case. The term is elaborated in GL0604 - Potential severity in safety incidents under slightly different circumstances (Equinor) .

The investigation team assesses that when the helicopter that crashed at sea with a significant wave height of 4-5 meters without the helicopter's buoyancy elements being triggered, it was in danger of sinking rapidly. This made it difficult for the crew on board to evacuate safely. The rescue work was also made more difficult by the waves and the fact that it was dark. The investigation team therefore believes that possible consequences would have been more seriously injured and fatal.

8.3 Assessment of major accident risk

Major accidents are defined in categories 7, 8 and 9 in *RM100 – Manage risk, R-24383 - SSU - Pre-defined SSU impact categories*. The probability that the incident could have developed into a major accident depended on the condition of the defined consequence-reducing safety barriers.

Fact 8-2 Definition of major accident

A major accident is an unplanned event that leads to:

- four or more deaths or injuries/illnesses with significant life-shortening effects, and/or
- major environmental impacts, including on species populations, ecosystems and vulnerable areas, and/or
- material damage and/or production stoppages, leading to major economic consequences for Equinor

WR2915 - Framework for major accident prevention - All Equinor, **Ref /16/**.

With a SAR crew of six people, the investigation team consider that this accident should be classified as a potential major accident.

9 Recommendations for learning and improvement

The purpose of Equinor's investigation is to ensure lessons learned from the incident and to identify measures to improve the company's work on SAR helicopter safety on the Norwegian continental shelf, with a particular focus on accident response. Since it has not been in the investigation team's mandate, nor has it been possible to investigate the causes of the incident, the investigation team is clear that the recommended measures do not provide a basis for drawing conclusions as to whether these have had an impact on the cause or outcome of the incident.

The incident has shown a need for learning and improvement in training and exercises, protective equipment and equipment in the helicopter, and interaction between different departments related to helicopter safety and emergency response. Furthermore, it has been found that there is a need for a new review of the measures provided in the investigation report after the Turøy accident. Finally, it should be considered whether Equinor should be a driving force in introducing more of the recommended measures as an industry standard. The investigation group's recommendations for improving safety are justified and described in **Table 9-1** to **Table 9-13**.

Table 9-1 Recommendations related to training for SAR nurses

Learning and improvement area	
• Through the survey of all SAR nurses in Equinor (**App H**), comments have been made related to the frequency of the pool training that is currently carried out every three years (**Ref /23/**), previously annually or bi-annually. A key element of the pool training is the underwater evacuation from an overturned helicopter, also called HUET (Helicopter Underwater Escape Training) • In pool training, the exercises take place in conditions that are not realistic in terms of waves and light conditions. Other equipment is also used in the pool compared to equipment used in the SAR helicopter • Annual CRM (Crew Resource Management) training for the entire SAR crew was recommended by an advisor in SSU in consultation with Aviation Safety in the autumn of 2016 (not a topic in the investigation report after the Turøy accident the same year), see **section 3.5.3** on page **26**. This has not been largely implemented, which is reflected in responses to the survey of the SAR nurses (**App H**), where only a maximum of one third regularly complete CRM training	
#	**Recommended measures**
1-1	The pool training for SAR nurse is done annually. The investigation team has been informed that Bristow has introduced this for its entire SAR crew after the incident
1-2	Equinor is contractually stipulating that the course providers deliver more realistic conditions during pool exercises. The investigation group is aware that some course locations have the opportunity to change the lighting conditions, use of wind machines with water splashes and some waves in the water. Equinor must ensure that the equipment used during the exercises is as much as possible the same as that used in the helicopter
1-3	Joint pool training with SAR crew must be striven for
1-4	Ensure that the SAR nurse regularly participates in CRM training, and that this is documented in Equinor's competence database CAMS

Table 9-2 Recommendation for protective equipment for SAR nurses

Learning and improvement area	
• Currently, each SAR nurse is responsible for storing the survival suit when not in use, ensuring that it is sent annually to the manufacturer for maintenance and inspection • For critical protective equipment such as survival suits, the investigation team believes that Equinor must have an overview and control of maintenance • Other life jackets are used in the helicopter than those described in the contracts with Bristow and CHC, and responses to the SAR nurses' survey showed that most were dissatisfied with the life jackets • The investigation team believes that it is only the rescuer who needs manual activation of a personal emergency beacon, since it is only the rescuer who is to be hoisted to sea during missions or exercises	
#	**Recommended measures**
2-1	Equinor is creating a system for overview of the maintenance status of survival suits. The system notifies the SAR nurse in good time of the need to send a survival suit to the manufacturer
2-2	Assess whether the equipment group for SAR nurses should be expanded to include representatives from Security, or whether the equipment group for SAR nurses should be included in the existing SAR interior equipment group
2-3	The equipment group for SAR nurses, in collaboration with the medical officer responsible for the SAR nurses, goes through the type of life jacket, also in relation to contract requirements
2-4	It is changed to an automatic emergency beacon for the entire SAR crew except the rescuer

Table 9-3 Recommendations related to helicopter exercises with SAR nurses

Learning and improvement area	
• The responses to the survey show that there is no common routine for how the SAR nurse is secured or stays in the cabin prior to exercises before the SAR nurse has an active role • A standardised safety video or safety instruction is not used in advance of helicopter flights as is done for passengers in the transport service (see introduction in **section 3.5.15** on page **32**)	
#	**Recommended measures**
3-1	In cooperation with the helicopter operator, it is considered whether a written, practically feasible plan can be established for the various types of exercises that are relevant for the crew of a SAR helicopter with the aim of improving personal safety
3-2	Consideration is being given to preparing a simple safety instruction (written with pictures or video). These safety instructions should be reviewed by the SAR crew jointly at the first exercise of each work period

Table 9-4 Recommendation related to the visibility of SAR helicopters in the Shared Resource Information Repository

Learning and improvement area	
• JRCC uses the data tool Shared Resource Information Repository to select resources for a rescue mission (see **section 3.4.3** on page **22**). The data tool can show the updated position and distance of available resources in relation to an incident location • As of today, Equinor's SAR helicopters are only entered with the position where the helicopter is stationed, not where it is located • The investigation team consider that Equinor should register its SAR helicopters in the Shared Resource Information Repository, with automatic updating of the helicopter's real position. Furthermore, each SAR coordinator must be tasked with keeping the information about their SAR helicopter up to date, for example during exercises, active missions or unavailability due to maintenance	
#	**Recommended measures**
4-1	Equinor registers its SAR helicopters in the Shared Resource Information Repository with automatic real-time position updates
4-2	The SAR coordinators will be tasked with keeping the information in the Shared Resource Information Repository up to date
4-3	Equinor is a driving force for Offshore Norway's members with SAR helicopters to register their SAR helicopters in the Shared Resource Information Repository

Table 9-5 Recommendations related to improved vision in the dark for SAR pilots

Learning and improvement area	
• The SAR crew in the rear cabin shall be able to use night vision goggles (NVG) when searching for persons at sea (see **section 3.5.7** on page **28**). The rear cabin and side windows must be arranged, and it must be trained at NVG, in accordance with the contract • NVG is used for pilots in the Rescue Helicopter Service and the Norwegian Air Ambulance, both for the pilots to carry out searches, but also to increase flight safety in the dark. So far, this has not been used for Equinor's SAR pilots, except in Hammerfest. The contracts with both Bristow and CHC allow for further implementation • The investigation team believes that Equinor must introduce the use of NVG for SAR pilots as well	
#	**Recommended measures**
5-1	Equinor also introduces NVG for SAR pilots
5-2	Equinor proposes the introduction of NVG for SAR pilots as part of the recommendation in guideline 066 from Offshore Norway

Table 9-6 Recommendations related to emergency management

Learning and improvement area	
• During the incident on 28.02.2024, there were at times three people with the role of Incident Commander (emergency response manager) in the IMT (2nd line emergency response) (**Ref /27/**). One of these was in training, one was recently checked out and the third had extensive experience in the role • In the CMT (3rd line of response), the Crisis Manager (head of the CMT) was designated to lead the Business Continuity team while the CMT was still mobilized (see **sections 3.2.5** on page **16** and **3.2.6** on page **17**) • Replacement of people during a long-term emergency response incident is normal, but the fact that there are several people who are perceived to have the same role, or that people move to a new role, can lead to misunderstandings if this is not clearly communicated • For several hours after the incident, the emergency management team had problems contacting Bristow directly on the set emergency number, but contact was made via other phone numbers. This also happened during the Turøy accident when Statoil had to contact suppliers	
#	**Recommended measures**
6-1	The investigation group believes that it is important that the entire emergency response team perceives that there is only one person leading the team: This must be an element that is trained in emergency response exercises
6-2	New emergency managers must be trained and trained on the importance of clear communication in the event of changes in emergency management. This applies both within the team, and those the team collaborates with
6-3	Review emergency phone numbers of suppliers to ensure direct contact when needed

Table 9-7 Recommendations related to communication

Learning and improvement area	
• During the incident on 28.02.2024, the first Holding statement was approved at 22:15, a little over two hours after Equinor received the first notification of the incident. The holding statement was prepared by the 2nd line (IMT) after the first meeting (at 21:20). This white paper contained little compared to what was already known in the media (see **section 5.3.2** on page **43**) • When the next of kin phone was opened at 9:17 p.m., those who operated the phone had no verified information they could pass on	
#	**Recommended measures**
7-1	Clarify who is responsible for preparing information for those who operate the next of kin hotline and staff the next of kin centre, so that they can receive information at an early stage
7-2	Ensure that established requirements (WR1214 App D) at the right time and use of the right channel for transmission are trained in exercises
7-3	During emergency response training, there should be interaction between IMT (2nd line) and CMT (3rd line) so that the desired practice for communication is practiced

Table 9-8 Recommendation related to temporary suspension of traffic with transport helicopters

Learning and improvement area	
• On the same evening as the accident occurred (28.02.2024), it was decided at 21:58 to stop all Equinor's helicopter traffic in Norway until 13:00 the following day (see detailed description in **section 5.3.3** on page **45**). It is important to emphasise that this was only relevant for delivery services, so that the SAR helicopters could still be used in the event of acute incidents • The next day, 29.02.2024, it was decided at 11:23 to postpone the start of transport traffic until 18:00. Operation Air started cancelling departures that would not be carried out anyway due to late departures • Later in the day, at 17:39, it was decided that all flights to and from the Norwegian shelf would be halted until Friday 01.03.2024 at 10 a.m. • On Friday 01.03.2024 at 11:17 a.m., it was announced that Equinor, in consultation with the Civil Aviation Authority, decided to resume flights with Sikorsky S-92 to the installations on the Norwegian continental shelf • The investigation group believes that these repeated postponements created uncertainty for passengers, their families, the helicopter operators and Air Transport Services, which controls helicopter traffic • The investigation group believes that a decision to stop helicopter traffic must not only be made based on flight safety, but also consider perceived safety	
#	**Recommended measures**
8-1	If a serious incident occurs with a helicopter, regardless of whether it is in transport service or SAR service, there should be no short-term, repeated postponements in helicopter traffic, but should be paused for at least one day

Table 9-9 Recommendation related to the introduction of a single SAR coordinator

Learning and improvement area	
• Today, Equinor has a SAR coordinator for each SAR helicopter. As an additional task, these will take care of the weather forecast service, SAR Tampen (Gullfaks) also has an HFIS service • If there had been a common SAR coordinator for all SAR helicopters, the investigation team believes this could have provided a better overview and faster response time to incidents	
#	**Recommended measures**
9-1	The investigation group recommends that a risk assessment be made in connection with the collection and transfer of the SAR coordinator task to land

Table 9-10 Recommendation related to locking of DaWinci

Learning and improvement area	
• In connection with the Turøy accident, measures were recommended to prevent access to the passenger lists in DaWinci • It is the head of the IMT (2nd line emergency response) who, according to the emergency plans, will decide on this locking • In the SAR accident, the trip in DaWinci was not locked, but deleted, and extended accesses are needed to revoke such deletion	
#	**Recommended measures**
10-1	Responsibility for preventing access to passenger lists in DaWinci is transferred to Offshore Air (round-the-clock staffed position) after they have received the necessary training on how to close a helicopter trip to view. This applies to all incidents, including with transport helicopters

Table 9-11 Recommendations related to perceived risk associated with helicopter flying

Learning and improvement area	
• Equinor has an external course available to improve mastery of the helicopter trip (**Ref /86/** and **App J**). The individual can sign up for this course themselves by agreement with their own manager • The duration of the course is 6 hours, and it is led by an experienced helicopter pilot and a psychologist • The Federation of Industrial Energy has also offered the same course for its members • Havtil's annual RNNP report includes a survey of perceived danger, where helicopter accidents are one of the questions. The next report is expected in March 2025	
#	**Recommended measures**
11-1	Information about the helicopter mastery course is posted visibly and available on Equinor's internal channels (Insight, DaWinci, etc.). It should be possible for the individual to sign up for this course directly, without prior agreement with the manager

Table 9-12 Recommendations related to follow-up of measures following the Turøy investigation

Learning and improvement area	
• Measures following the investigation of the Turøy incident pointed to the need for a review of the organisation of helicopter safety in the company to ensure simplification and clearer role descriptions within Flight Safety, Air Transport Services and Contract (**Ref /41/**) • Through conversations with employees in different departments, and at different management levels, the investigation group believes this need is still present • The verification, which was carried out two years after the Turøy accident, concluded that several of the measures had been closed without being sufficiently documented • The investigation team has also found that there is no good documentation on how recommendations from this verification report are closed	
#	**Recommended measures**
12-1	A clear, unambiguous and agreed division of roles and responsibilities between the Flight Safety (FS) and Air Transport Services (ATS) departments must be ensured and anchored with the head of EPN JOS. Cooperation between these departments must also be strengthened to ensure compliance
12-2	The mandate, meeting agenda and working method for the Aviation Logistic Team (ALT) must be evaluated to ensure that the intention of measure number 1 from the Turøy report is achieved
12-3	Other measures under the Turøy report must be reviewed again to ensure that the measures have had the expected, long-term effect

Table 9-13 Recommendations related to contact with Offshore Norway

Learning and improvement area	
• The investigation group has proposed that two of the measures (4-3 and 5-2) be recommended as industry standards in Offshore Norway • There may also be other measures that should be taken further out than Equinor, either against helicopter companies or other oil companies	
#	**Recommended measures**
13-1	The working group that will ensure that the recommended proposals for measures are converted into a learning plan is considering whether Equinor should also be a driving force in having these introduced as industry standards for measures other than 4-3 and 5-2

10 Abbreviations and terms

Abbreviations and terms	Explanation
AOBD	Air Operating Branch Director
BA	Business Area
BC	Business Continuity
Bristow	Helicopter company founded in 1955
CEO	Chief Executive Officer
CHC	Helicopter company with roots back to Okanagan Air Service, founded in 1947
CM	Crisis Manager Head of 3rd line emergency response
CMT	Crisis Management Team 3rd line response
CoS	Chief of Staff On duty role in CMT
DaWinci	Computer tools used in helicopter logistics, both for the transport service and SAR
DSHA	Defined Situations of Hazards and Accident
EASA	European Union Aviation Safety Agency
EAT	Executive Advisory Team
EPN	Exploration and Production, Norway
ERT	Emergency Response Team 1st line response
FAL	Medical Officer
FlightRadar24	Website showing real-time and historical movements of aircraft/helicopters. See disclaimers in **Fact box 5-1** on page **35**
FR	Functional Requirement
GL	Guideline
HABD	Helicopter Aircrew Breathing Device
Havtil	Norwegian Ocean Industry Authority, previously Petroleum Safety Authority, PSA
HEED	Helicopter Emergency Egress Device
HFIS	Helicopter Flight Information Service
JRCC	The Joint Rescue Coordination Centre, - JRCC-NN: Northern-Norway – Localized in Bodø, - JRCC-SN: Southern-Norway - Localized at Sola outside Stavanger
HUET	Helicopter Underwater Escape Training
IC	Incident Commander Leader of the 2. Line Emergency Response
IMT	Incident Management Team 2nd line response
iSAR	Computer tool to log the competence status of SAR crew
MarineTraffic	Website showing real-time and historical movements of ships and some aircraft/helicopters. See disclaimers in **Fact box 5-1** on page **35**
Mayday Relay	Distress signal sent from someone other than the person in distress
Medevac	Medical evacuation
NSIA	Norwegian Safety Investigation Authority
OSC	Operation Section Chief
PO	People and Organisation / Human Resources - HR
Polaris	Control centre in Avinor

Abbreviations and terms	Explanation
PSS	Personnel Support Supervisor
RNNP	Trends in Risk Level (Risikonivå i Norsk petroleumsvirksomhet) (annual report published by Havtil, previously PSA)
SAR	Search and Rescue
SPT	Strategic Project Team
SSU	Safety, Security and Sustainability
STASS	Short Term Air Supply System
WR	Working Requirement

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/84/ Website for Helis.com with database of helicopters, information page about the helicopter involved in the accident - LN-OIJ, https://www.helis.com/database/cn/26519/, visited 06.05.2024

/85/ Haukeland University Hospital message on X «The helicopter accident: Update at 0910 for the five hospitalized: One critically injured, one seriously injured, three slightly injured», dated 29.02.2024, at 09:09, https://twitter.com/haukeland_no/status/1763114296601407837

/86/ Website for International SOS with helicopter course, https://images.learn.internationalsos.com/Web/InternationalSOS/%7B07d60e66-6798-44b7-84f8-a4950655e8f5%7D_Helikopterkurs_16.05.2023.pdf, visited 23.05.2024 (*only in Norwegian*)

App A Mandate

Below is an unsigned translation of the mandate for the investigation.

Mandate for investigation of SAR helicopter safety in Equinor after the helicopter accident on 28 February 2024

Purpose

The purpose of Equinor's investigation is to ensure lessons learned from the incident and to identify actions to improve the company's work on SAR helicopter safety on the Norwegian continental shelf, with a particular focus on emergency response.

The Accident Investigation Board Norway (AIBN) is mapping the course of events and causal factors for the accident. Equinor's investigation team will not assess these matters. Equinor's investigation will assess conditions that can be evaluated regardless of whether the AIBN's investigation report has been completed. Equinor's investigation is intended to complement the picture uncovered by the AIBN's investigation, seen from Equinor's point of view. The helicopter company Bristow will conduct an investigation, in which Equinor will participate with an observer. The police are also investigating the incident.

Background

On Wednesday evening 28/2-2024, one person died in a serious helicopter accident outside Sotra. The deceased was employed by Equinor as a nurse. The helicopter was on an exercise mission for Equinor and was attached to the SAR service for the Oseberg area. Bristow Group was the operator and owner of the helicopter. There were a total of six people on board the helicopter and the five survivors are employed in Bristow.

Scope of work/ deliveries

Equinor's investigation will conduct a review of the following matters to the extent relevant to the accident on 28 February 2024:

- Equinor's organisation and activities related to SAR helicopter services.
- Equinor's handling of notification and emergency preparedness in connection with the incident, including:
  - interaction with authorities and partners.
  - business continuity.
- Equinor's follow-up of recommendations and actions following the helicopter accident on Turøy in 2016.

Based on the investigation work, the investigation team will provide its observations, including related learning, and recommend actions to strengthen the company's work on SAR helicopter safety and emergency response.

If, in the course of its work, the investigation team discovers conditions that are critical to safety, the contracting authority must be informed of this immediately.

The investigation team may also, based on information that emerges internally or externally, recommend to the commissioning entity to expand the scope of the investigation.

Members of the investigation team

- Erling Kristian Handal, Head of Investigation, CAI
- Geir Støkken Østby, Co-investigator, CAI
- Øivind Solberg, Expert, JOS Flight Safety
- Catherine Marchand Støle, Legal
- Maiken Ree, COM
- Monica Martinsen S-AMU (Central Working Environment Committee)
- Ståle Hopland, Associations
- Terje Werner Hansen, Associations

The commissioner for the investigation is the CEO, Anders Opedal. The client's representative is Jannicke Nilsson (EVP SSU). The investigation will be carried out at assignment level 1, and will use current principles, requirements and guidelines for accident investigations as a starting point, as described in work process INV101.

Schedule

The report should be available by 14.06.2024. The report will be made public.

Information that, based on current legislation or confidentiality requirements, cannot be made public, will be communicated to the commissioning entity in an appropriate manner, but will not be included in the public report.

Place /Date

Anders Opedal
CEO

App B Description of each member of the investigation team

Erling Handal: Graduated as a civil engineer in engineering physics from NTH (now NTNU) in 1984. Employed at DNV's Materials Technology Laboratory 1985 – 2001. HSE Coordinator/Safety Manager in Hydro 2001-2004. Auditor/accident investigator in Hydro from 2005. Full-time accident investigator since the merger between Statoil and Hydro in 2007. Has led a total of 46 investigations and been a co-investigator in a further 15 investigations.

Geir Østby: Educated at the Air Force Technical School Center (LTS) 1979. Flew as a helicopter engineer at 337 Squadron until 1984. Technician at Exploration Loging (EXLOG) 1984 – 1986. Process Control/Automation in Sønnico on/offshore on Gullfaks A/Edda 1986-1988. Engineer, Rock Mechanics Laboratory, Norsk Hydro's Oil and Gas Research Centre in Bergen 1988 – 1999. Basic subject in Geology at UIB 1990. Engineer Technical Safety/Accident Investigator Troll Projects/ Safe Operation in Hydro 1999-2007. Engineer, ATS/Aviation safety, Statoil-Hydro 2007–2009. Full-time accident investigator in Statoil/Equinor since 2009. Co-investigator in the investigation group that investigated helicopter safety in Statoil after the Turøy accident on 29.04.2016.

Øivind Solberg: Started as a pilot in the Air Force in 1981. Flew offshore for Braathens Helicopter and later Helikopter Service from 1991. Further education as an engineer in automation, Master and PhD in risk management and societalsafety. Long career in CHC as Security Advisor, Accountable Manager - Head of Operations in Norway and Head of Safety and Quality. Worked with aviation safety since 1988, then was the squadron's flight safety officer at the 720 squadron at Rygge Air Station. Joined Equinor in 2017 in the Aviation Safety Department.

Catherine Marchand Støle: Graduated as a lawyer from the University of Bergen in 1987. Employed as a lawyer in Equinor in 1997. Part of the management team in the legal (LEG MC) period 2007-2021 as head of LEG COR and LEG EPN, respectively. In the latter position, supported by accident investigations, participant in CMT and Business Continuity. From 2021 senior advisor in LEG MMP.

Maiken Ree: Trained as a journalist from the London College of Communication with journalism experience from Stavanger Aftenblad, Petro Media and Teknisk Ukeblad. Has extensive experience with communication work from, among others, Offshore Norway, the offshore conference ONS and Stavanger municipality. Started as Leader Communication in Equinor in 2023 and is on duty as CCOM officer in the 3rd line (CMT).

Monica Martinsen: Certified electrician, has been employed by Equinor since 2010, before that in similar oil companies since 2000. Has most of the working life, in addition to a regular job, held positions such as safety delegate, main safety delegate and union representative. For the past 5 years or so, I have been working full-time as HSE manager in SAFE Shelf's working committee. Has some experience with investigations in the past and participated in several working groups, including Oseberg/Tampen SAR and emergency response analyses. Is a representative in EPN S-AMU (Continental Shelf Working Environment Committee) and a representative in Equinor's Aviation Safety Forum.

Ståle Hopland: Certificate in process chemistry, employed by Equinor 1996. Main safety delegate at Heidrun full-time, has been involved in many accident investigations. Through the trade union Equinor employees' association Lederne (EQAF), has helped to look at alternatives to the Sikorsky S-92 over several years. Has also been part of the user group in the construction of a new SAR helicopter hangar at Heidrun.

Terje Werner Hansen: Apprenticeship mechanical, has been employed since 1986, joined Hydro Porsgrunn, became part of Hydro's and eventually Equinor's offshore organization. Has the longest periods at Heimdal and Oseberg Field Centre but has also visited other installations. During his professional life, he has had many years of positions as both safety delegate/main safety delegate and union representative. Has now been approx. 5 years as a full-time union representative for Industri Energi Equinor Continental Shelf Association and is part of the working committee there, with main responsibility for the facilities in Operation West. Has participated in several working groups, as an employee representative, including the group that looked at the SAR service at the Oseberg Field Center, where the result was that from 2026 an AW 139 SAR will be stationed there.

App C Detailed timeline of the rescue operation

Reservations are made that the times in the table may be from when the event was **logged**, i.e. not when it **actually** happened. Names of people have been removed.

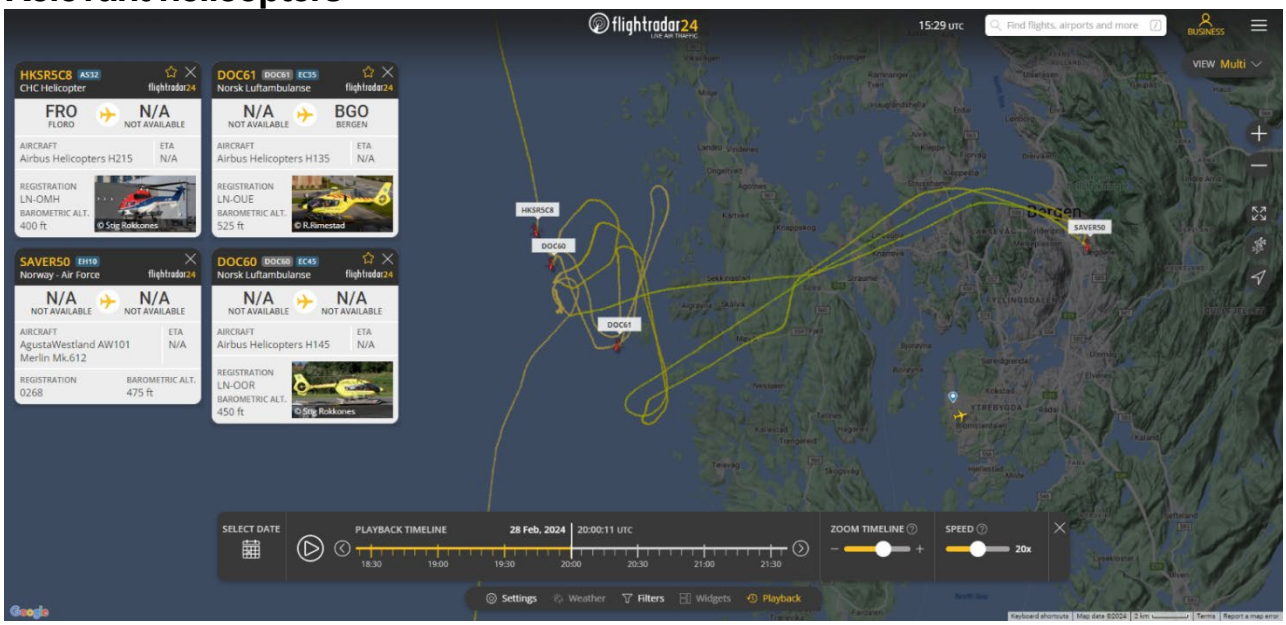
Time	Description	Source
18:25	NORSAR6 (LN-OIJ) took off from Flesland	Log SAR-coordinator Oseberg (**Ref /25/**)
18:43	General twilight from 18:01 to 18:43, Nautical twilight from 18:43 to 19:32	https://www.timeanddate.no/astronomi/sol/norge/bergen?month=2&year=2024
19:32	Nautical twilight from 18:43 to 19:32, Astronomical twilight from 19:32 to 20:22	https://www.timeanddate.no/astronomi/sol/norge/bergen?month=2&year=2024
19:38:52	The last recorded signal from LN-OIJ was altitude 400 feet, speed 16 knots, course 160 degrees	FlightRadar24 (**Ref /56/**)
19:41	The Joint Rescue Coordination Centre Southern Norway at Sola received a report that an emergency beacon had been triggered on an aircraft. The rescue leaders on duty immediately started to check more closely which machine was sending the signal and tried to make contact	Timeline received from JRCC (**Ref /29/**)
19:44	JRCC asked Avinor (air traffic controller) to check if they could make contact with the plane	Timeline received from JRCC
19:44	JRCC confirmed that it was one of the rescue helicopters from Bristow, and that they had been out on a training trip	Timeline received from JRCC
19:47	Avinor reported to JRCC that they could not get in touch with the helicopter on the radio	Timeline received from JRCC
19:48	JRCC contacted the SAR Queen rescue helicopter from Sola (*SAVER50*), as they were the nearest rescue helicopter. They were already in the air on a training trip, JRCC informed and asked them to go in the direction of the position outside Sotra they had received from the emergency beacon	Timeline received from JRCC
19:52	JRCC alerted the rescue helicopter in Florø	Timeline received from JRCC
19:52	SAR Queen SAVER50 during an exercise west of Stavanger with vessel Skandi Mongstad, SAVER50 changed course and speed, went north at 180 - 190 knots	Marine Traffic (**Ref /57/**)
19:54	JRCC asked Coastal radio to send a "mayday relay" to vessels in the area	Timeline received from JRCC
19:58	Mayday Relay on ch.16. Possible missing helicopter	Log SAR-coordinator OSE
20:02	Ambulance boat "Austevolljenta" asked to go towards the area	Timeline received from JRCC
20:03	Rescue helicopter Sola reported to JRCC that they were about 15 minutes from the stated position	Timeline received from JRCC
20:05	The air ambulance coordinator in the west informed that they had two available air ambulance helicopters. JRCC requested that these be searched	Timeline received from JRCC
20:05	JRCC asked Coastal radio to call out rescue boats from the Norwegian Society for Sea Rescue. There was talk of "Bjarne Kyrkjebø" and "Kristian Gerhard Jebsen II"	Timeline received from JRCC
20:06	JRCC was informed that there were six people on board	Timeline received from JRCC
20:06	The ambulance boat "Austevolljenta" left the quay on the east side of Bakholmen. Went north at a speed of around 30 knots	Marine Traffic

Time	Description	Source
20:07	LN-OMH / HKSR5C8 took off from Florø, headed south at a speed of around 90 knots, and an altitude of 1300 feet	FlightRadar24
20:10	The rescue boat "Bjarne Kyrkjebø" left the quay at Grimstadvegen	Marine Traffic
20:10	Pilot boat 118 left the quay in Hummelsund, went south, then east in Krossfjorden at a speed of around 18 knots	Marine Traffic
20:13	The rescue boat "Kristian Gerhard Jebsen II" (MMSI no. 257952600) left the quay in Vågen, Bergen city center. Went west at a speed of around 38 knots	Marine Traffic
20:14	Air ambulance LN-OUE / DOC61 took off from the base in Møllendalsveien at Haukeland Hospital	FlightRadar24
20:18	Air ambulance LN-OOR / DOC60 took off from the base in Møllendalsveien at Haukeland Hospital	FlightRadar24
20:22	Astronomical twilight from 19:32 to 20:22, night from 20:22 to 05:19 the next day	https://www.timeanddate.no/astronomi/sol/norge/bergen?month=2&year=2024
20:23	SAVER50 arrived near the search area, reduced speed (about 100 knots) and altitude (about 500 feet)	FlightRadar24
20:25	SAVER50 reduced speed and altitude further, to near standstill (under 10 knots) and low altitude (below 400 feet)	FlightRadar24
20:25	Rescue helicopter Sola observed people in the sea and started the process of hoisting people up	Timeline received from JRCC
20:26	Air ambulance LN-OOR / DOC60 right next to search area	FlightRadar24
20:28	LN-OMH/HKSR5C8 reduced altitude from 1300 feet to 800 feet	FlightRadar24
20:28	JRCC posted a tweet: "We have received a distress message from a helicopter west of Bergen, and we are currently unable to make contact with the helicopter. A rescue helicopter from Sola is in the area and searching."	https://twitter.com/HRSSorNorge/status/1762922674458616067
20:28	JRCC posted a tweet: "JRCC is now staffing up but does not yet have the capacity to answer the press phone. More information will be provided when we have more to report."	https://twitter.com/HRSSorNorge/status/1762922836325191743
20:30	Air ambulance LN-OUE/DOC61 right next to search area	FlightRadar24
20:31	Air ambulance LN-OOR / DOC60 reduced speed from over 100 knots to below 20 knots	FlightRadar24
20:37	Rescue helicopter Sola reported that they did not see the helicopter itself that had crashed	Timeline received from JRCC
20:39	Weather conditions just south of the accident site reported via "Austevolljenta":- Wind 29 knots, direction 169 deg- Current 1.57 knots, direction 167 deg- Waves 0.6 m, period 4.2 sec, direction 276 deg, sign. wave height 3.9 m- Swells 3.8 m, period 12 s, direction 278 deg- Air temp. 3 degrees	Marine Traffic
20:41	JRCC posted a tweet: "We have SAR Queen in the area. They are aware of personnel in the sea and have started hoisting."	https://twitter.com/HRSSorNorge/status/1762926119068545446
20:49	SAVER50 increased speed and altitude, headed east towards land/Haukeland Hospital (130-140 knots, altitude 1200-1400 feet)	FlightRadar24
20:51	Rescue helicopter Sola reported that they were on their way inland and went towards Haukeland with five people	Timeline received from JRCC
20:51	When asked why the helicopter from Sola did not take all six with it in the first trip, operational rescue inspector Andreas H. Næsheim of JRCC says the following. "The Sola rescue helicopter located all six and had the fuel to lift up five. At that point, the crew told JRCC that they had to refuel and flew back towards Haukeland."	https://www.bt.no/hendelser/i/VPKqAd/helikopterulykke-utenfor-sotra-redningshelikopter-fra-sola-hadde-bare-drivstoff-til-aa-plukke-opp-fem

Time	Description	Source
20:57	Ambulance boat "Austevolljenta" arrived in position, they reported a lot of sea	Timeline received from JRCC
20:58	LN-OMH/HKSR5C8 reduced speed from 90 knots to 14 knots, and altitude from 675 feet to 350 feet	FlightRadar24
20:59	SAVER50 arrived at Haukeland Hospital	FlightRadar24
21:03	LN-OMH/HKSR5C8 reduced speed to 5 knots, altitude still 350 feet	FlightRadar24
21:11	LN-OMH / HKSR5C8 increased speed from 2 knots to 132 knots, and altitude from 375 feet to 1225 feet, set course for Haukeland Hospital	FlightRadar24
21:11	Rescue helicopter Florø confirmed discovery of last person	Timeline received from JRCC
21:16	Rescue helicopter Florø confirmed that they have one person on board and went towards Haukeland	Timeline received from JRCC
21:18	JRCC posted a tweet: "CHC's rescue helicopter from Florø has hoisted up the last person from the sea and is now flying to Haukeland. His health condition is unknown."	https://twitter.com/HRSSorNorge/status/1762935398915809694
21:22	LN-OMH / HKSR5C8 landed at Haukeland Hospital	FlightRadar24
21:50	JRCC posted a tweet: "The rescue operation is now finished. We extend a big thank you to everyone who has contributed tonight."	https://twitter.com/HRSSorNorge/status/1762943277181931574

App D Description of the accident helicopter and relevant emergency response resources 28.02.2024

Relevant helicopters



Maps from the website FlightRadar24 (**Ref /56/**) show the route of the four helicopters in question during the rescue operation. Position 28.02.2024 at 21:00 Norwegian time is shown with a red helicopter symbol. SAR Queen (SAVER50) had just landed at Haukeland University Hospital with five of the SAR crew from the accident helicopter, while SAR from Florø (HKSR5C8) was on its way to pick up the last of the SAR crew. The two helicopters from the Air Ambulance assisted in keeping control of the last of the SAR crew while SAR Queen flew in towards Haukeland until SAR Florø arrived.

Accident helicopter LN-OIJ – Sikorsky S-92A

Source: FlightRadar24, photographer R. Rimestad

The S-92A helicopter, with serial number 92-0169, was produced in 2011 by Sikorsky, USA. The helicopter was taken over by Bristow in 2013 and operated by Bristow for Her Majesty's Coast Guard. From 2019, it was operated by Bristow for oil and gas activities in the UK sector until it was taken over by Bristow Norway from February 2023 (**Ref /84/**).
The SAR helicopter has five seats for SAR crew in the rear cabin. The S-92A as a transport helicopter has 19 passenger seats.

SAR Queen from Sola 0268 (SAVER50) – AgustaWestland AW101 Merlin Mk.612

Source: FlightRadar24, photographer R. Rimestad

The AgustaWestland helicopter with serial number 50268, was manufactured by Leonardo Yeovil, UK, and delivered to the Norwegian Air Force in 2017 (Source: Helis.com).

SAR fra Florø LN-OMH (HKSR5C8) – AS332L Super Puma

Source: FlightRadar24, photographer Stig Rokkones

The Airbus Helicopters H215 helicopter, formerly called Eurocopter AS332 SuperPuma, with serial number 2113 was manufactured in 1984 by Aérospatiale, France. It is operated by CHC for the Rescue Helicopter Service.

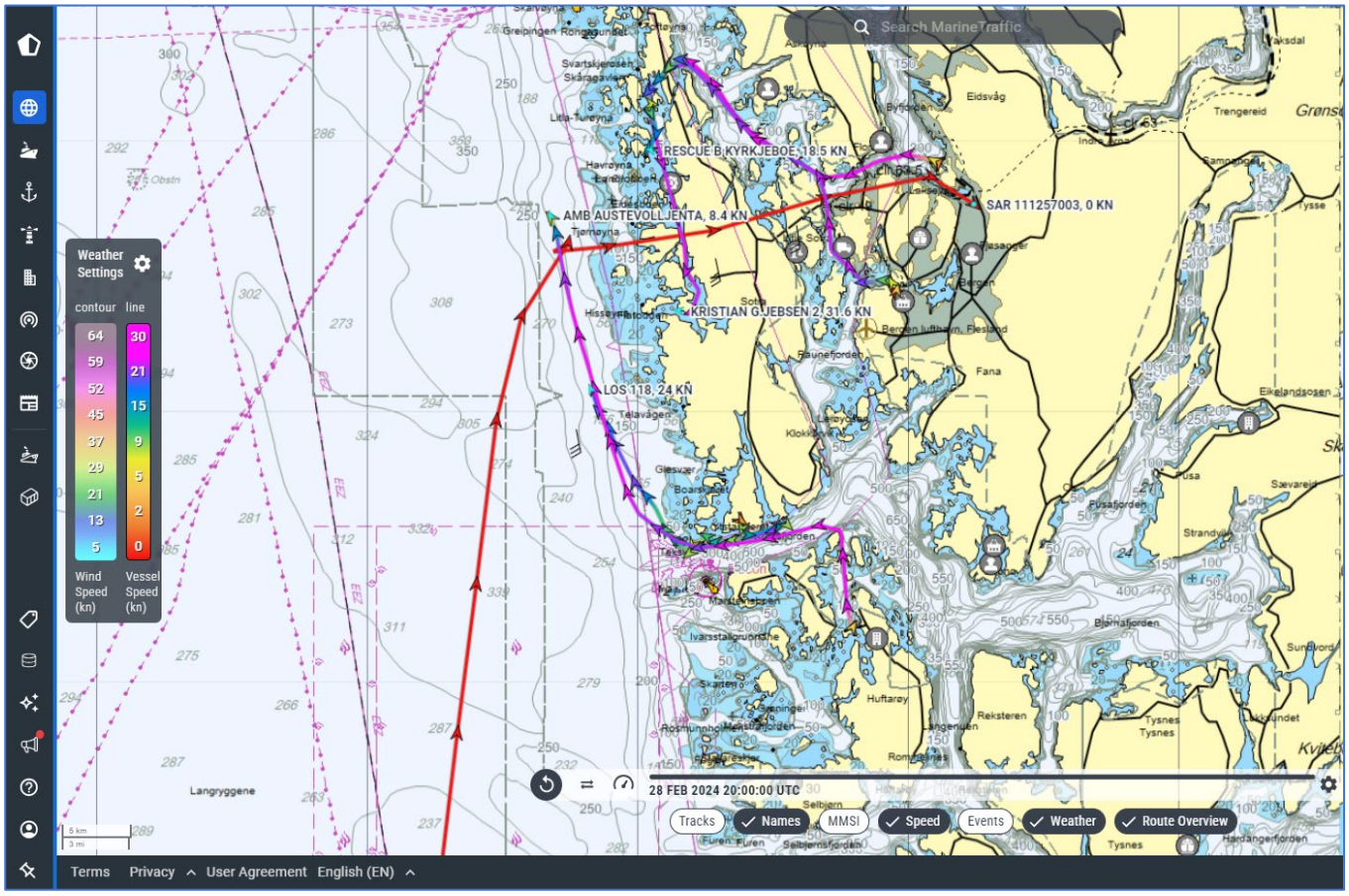
Air Ambulance LN-OOR (DOC60) – Airbus H145

Source: FlightRadar24, photographer Stig Rokkones

Air Ambulance LN-OUE (DOC61) – Airbus H135

Source: FlightRadar24, photographer R. Rimestad

Relevant vessels



Map from the website MarineTraffic (**Ref /57/**) shows the route of the four boats in question and the SAR Queen during the rescue operation with position and speed shown on 28.02.2024 at 21:00 local time. SAR Queen (111257003) had just landed at Haukeland University Hospital. The colour code on the lines shows the speed of the boats along the route, but is not correct for the helicopter shown in red, i.e. 0 knots along the entire route.

Ambulance boat Austevolljenta

Source: MarineTraffic, photographer Paul Misje

Length 22.24 meters, width 7.5 meters.

L/B «LOS 118»

Source: MarineTraffic, photographer Geir Vinnes

Length 16.80 m, width 5.20 m, speed up to 29 knots.

RS163 Kristian Gerhard Jebsen II

Kilde: MarineTraffic, fotograf Geir Vinnes

Length 17 m, width 4.6m, speed 42 knots

RS140 Bjarne Kyrkjebø

Source: MarineTraffic, photographer Frode Adolfsen

Length 12.75 m, width 3.48 m, speed 30 knots

App E Health requirements for SAR nurse

Health requirements for SAR nurses are described in WR2551 (**Ref /9/**). The requirements are based on the "Guidelines for Health Examination and Physical Tests for Emergency Personnel in Search and Rescue Teams with a Smoke Diver Function" (**Ref /48/**), "National Standard for Rescuers" (**Ref /45/**) and "National Standard for Air Ambulance Doctors" (**Ref /47/**).

The requirement describes that "*SAR nurses must be health-wise and physically fit to perform their function as a medical passenger in the SAR service. The function includes hoisting to and from the boat, transporting equipment and stretcher, etc.*»

Health examinations and physical tests must be carried out every two years.

Physical functional requirements
General: Persons who do not meet the health requirements, or where there is doubt about this, should not carry out physical tests unless this has been clarified with the FAL (Medical Officer) for SAR. This means that the health examination must take place before the physical test.
Physical functional requirements are carried out every 2 years at a "fitness center"
Every 4 years, it can be carried out in connection with the Basic Safety Course basic course instead of basic first aid on day 1 (as this is handled in the SAR certification scheme) or as a separate activity.
Result of physical functional requirements test with conclusion sent FAL for SAR and FAL for installation
Specification of requirements
The following requirements are documented completed and passed at the start of the SAR nurse function and thereafter every two years. Normal work attire is used.
The requirements are identical to the physical requirements in the National Standard for Air Ambulance Doctors.
Endurance:
Treadmill: Walk 5.6 km/h, 10 percent (5 degrees) incline, 10 min duration. An emergency backpack (approx. 10 kg) must be carried on the back.
Strength:
Carry 20 kg in each hand up 2 floors.

App F Physical requirements for rescuers in the SAR service

In 2002, the Ministry of Justice and Public Security and the Ministry of Health and Care Services established a common national standard for rescuers in the air ambulance service, the rescue helicopter service and SAR offshore (**Ref /45/**), where "*the purpose is to ensure equal medical and rescue services within each service area for both the requester and the user of the service*".

For rescuers SAR-offshore, the following physical maintenance requirements apply, which must be documented as passed once a year:

Exercise	Requirement	Execution
Chin-up	6 repetitions	Carried out with over grip. Pull up until your chin is above the boom and then lower all the way down until your arms are straight.
Sit-ups	40 repetitions	The legs are placed on a firm surface with a 90-degree bend in the knee joint. Hands should be behind the head
Plank	2 minutes	Can replace sit-ups
Push-ups	30 repetitions	Shoulder-width between the hands, legs together, straight body.
Back raise	15 repetitions	

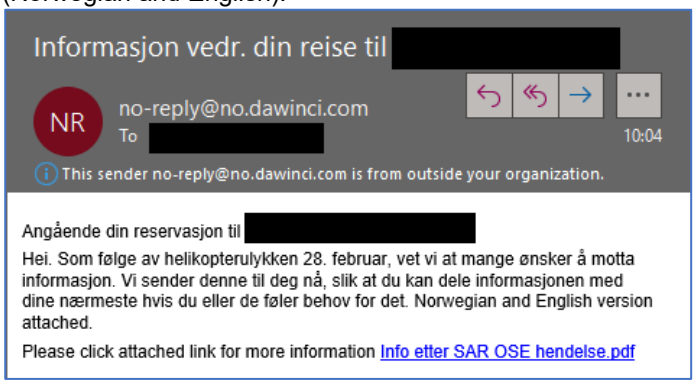
In addition, there are five different endurance exercises, one of which must be carried out in connection with a physical test. The choice of exercise can take place in dialogue between the employee and the employer:

Exercise	Age				
	20-29	**30-34**	**35-39**	**40-44**	**45-60**
Running 3000 m	13:00	13:00	13:30	14:00	14:30
Biking 20 km	40:00	40:00	41:00	41:30	42:30
Swimming 500 m freestyle in pool	8:50	8:50	9:20	9:30	9:40
Swimming 500 m breaststroke in pool	10:20	10:20	10:50	11:05	11:20
Rowing with rowing machine 5000 m	22:00	22:30	23:00	23:30	24:00

There is no explicit mention of the retirement age for rescuers in these guidelines, but the investigation team notes that no physical requirements are specified after the age of 60.

App G DaWinci Traveller Information

Those who travelled offshore in the aftermath of the helicopter accident automatically received the following message (Norwegian and English):



Informasjon vedr. din reise til [redacted]

NR no-reply@no.dawinci.com

To [redacted] 10:04

This sender no-reply@no.dawinci.com is from outside your organization.

Angående din reservasjon til [redacted]

Hei. Som følge av helikopterulykken 28. februar, vet vi at mange ønsker å motta informasjon. Vi sender denne til deg nå, slik at du kan dele informasjonen med dine nærmeste hvis du eller de føler behov for det. Norwegian and English version attached.

Please click attached link for more information Info etter SAR OSE hendelse.pdf

Information to travellers from Equinor regarding the helicopter accident on 28 February

The helicopter that crashed on 28 February was a search and rescue (SAR) helicopter on a training exercise outside Bergen. There were six people on board, one of whom perished as a result of the accident. The training exercise was carried out at a low altitude in connection with hoisting from the sea.

The helicopter type was S-92, which is currently the only type of helicopter we fly on the Norwegian shelf.

Equinor's number one responsibility is to ensure the safety of everyone involved in our operations, including all of you who travel to and from work on our installations by helicopter.

We understand that travellers, their families and others close to them may be concerned. Equinor wants to help create a sense of security by explaining the assessments that have been made so far. We encourage you to share this information with your families and those close to you, as we've received some feedback that these are the persons who have the greatest concerns.

After the accident, Equinor decided to suspend its flights on the shelf. Flights were resumed on 1 March, in consultation with the Civil Aviation Authority (CAA), the helicopter companies and the other operating companies.

Equinor's aviation safety staff has maintained a close dialogue with helicopter operators, the Accident Investigation Board Norway (AIBN) and the CAA.

Based on our dialogue with the CAA and information the CAA has received from the AIBN, there are no indications that a common technical fault on S-92 helicopters was the triggering cause of the incident. The CAA sees no reason to ground S-92 helicopters.

It will take some time before the AIBN can answer all the outstanding questions, but we have received sufficient answers to assure us that our carrier flights fulfil our aviation safety requirements.

Therefore, there are no indications that the safety of our carrier flights is compromised, and we have therefore decided to resume flights after the fatal accident involving the SAR helicopter outside Bergen.

This decision is also supported by helicopter operators CHC and Bristow, as well as the CAA.

There has been good, hands-on cooperation with the safety delegate service and the trade unions as regards the handling of this accident.

Other relevant information:

We are currently experiencing some delays. Part of the reason for this is the time spent on providing information prior to departure from land and offshore. This is being done as a temporary measure, with a planned duration to 15 March.

Some tips from the Centre for Crisis Psychology are listed below – you may find them useful:

Some techniques to help people who feel anxious about helicopter flights:

- It's natural that you may have different thoughts and feelings before this trip, compared with what was previously the case.
- Some people's thoughts may focus on those who were in the helicopter and their families, and feel sympathy and sadness.
- Others may be worried about themselves before boarding the helicopter, listening to every sound and being on edge and alert during the flight.
- Physical reactions that tell us we are uneasy or frightened may be unpleasant; heart palpitations, a sinking feeling, trembling, stomach issues, chest pressure, a need to just get away from it all – and a whirlwind of thoughts.
- These are completely normal reactions when such a dramatic incident occurs so close to home.

However, it's important to separate these reactions from actually being in danger.

- We may experience fear, even if the situation is safe. After having an up-close experience with something so terrifying, we may react with fear even if we know that it's safe now.
- This is where our thoughts and feelings intersect. When we think about what we're scared of and imagine that something terrible might happen, this increases the physical fright response, which in turn reinforces the troubling thoughts.

It's important to try to calm anxiety when we're not in danger, such as by using new methods to deal with thoughts and reactions. There are self-help methods that can help relieve some of this anxiety.

Using safe thoughts to counter thoughts that create fear:

- It's safe to fly. A multitude of helicopters fly every day, in all kinds of weather, transporting people to and from their destinations. Think about everything you know and have learned about safety and statistics.
- When you feel anxiety, it's just your body reacting to something that's already over. Tell yourself "I'm safe. It's just an increase in adrenalin in my body that's making my heart pound like I've just run a race".

Distraction:

Try to distract yourself and think of something completely different:

- Something you look forward to; imagine it in detail
- Solve a mental task (count backwards from 1000 in sets of 7)
- Imagine a place you have a connection with, and which carries good associations and feels safe, use all your senses to imagine that you're there (such as a holiday destination)
- Music

How to directly calm the body's physiological response:

Breathing exercise:

- Inhale through your nose, using calm, deep breaths. When you've taken a full breath, inhale a bit more and then slowly exhale through your mouth. Spend longer on exhaling than inhaling. Repeat this 4-5 times. You can also repeat this sequence during your flight.

App H Survey of SAR nurses

On the following pages are 59 questions for all of the 30 SAR nurses in Equinor, both own employees and contractors. The survey was sent out on 15.04.2024, i.e. after the accident, and the responses are anonymous. As of 19.06.2024, 22 responses had been received. This covers both those who primarily work on a Bristow or a CHC helicopter, and 21 out of 24 permanently employed Equinor SAR nurses.

A summary of the responses was reviewed with the SAR nurse who heads an equipment group and with the doctor in charge of the SAR nurses.

What the investigation team wants to highlight from the investigation is:

- When changing equipment, new training is consistently given
- The selection of life jackets does not work as intended (17 no, 4 yes), several answer that they are looking for vests in several sizes
- Only half have a dedicated life jacket in the SAR helicopter, and less than 1/3 know how often life jackets are checked (6 yes, 15 no)
- All have dedicated survival suits, but the SAR nurse is responsible for preparation after use, storage and maintenance at the manufacturer
- Different practices emerged for when you are strapped in and when you are loose in the helicopter
- Most people immediately know what the nearest emergency exit is in an emergency (17 yes, 3 no), and the nearest emergency exit is most often available in relation to placement in the cabin (16 yes, 4 no)
- The frequency of exercises varies somewhat, but the most common answer was 2-4 exercises during duty weeks
- A few (4 yes, 17 no) had participated in simulator trainings, and at long intervals. It is somewhat unclear what the respondents meant by simulator training; this may be due to the wording in the question
- Many consider manual triggering of the personal locator beacon is cumbersome
- The breathing air system is trained on every 2 or 3 years, and the training is experienced by many as unrealistic, with different equipment, and the training should have been more frequent
- For other pool training, there is a lot of different equipment compared to what is used in the SAR helicopter
- There are varying answers as to whether the SAR nurse participates in CRM training in the form described in **section 3.5.3** on page **26**. In total, the investigation team consider that a maximum of eight of the 22 who responded to the survey complete full CRM training
- Most responded that they have been followed up after the accident (19 yes, 2 no), and this has generally been experienced positively
- The phasing in of Bristow as the new operator of SAR helicopters went too quickly, so that there was little time for joint training in advance. The investigation team has been informed by Bristow that they wanted a longer period
- Some of the SAR nurses feel that they are not well included in internal meetings at the helicopter companies. This came in response to an open-ended question, not as a separate question. Since the survey was answered anonymously, it is not possible to follow up on this, and it is unclear to the investigation team whether these are internal company meetings or SAR meetings

Survey for Equinor's SAR nurses

This survey is an important part of the work for the internal investigation team when we investigate Equinor's management of SAR helicopter safety and emergency preparedness. We hope that you will take the time to answer so that we get a better impression of how you as a SAR nurse feel that you are enabled to do a good and important job in a safe way.
The answers will help us in the investigation team to design recommended actions.

All questions are related to the SAR helicopter, i.e. not equipment you use in a transport helicopter!

The responses to the questionnaire are submitted anonymously, and only recipients of this questionnaire can

respond. It is only possible to submit a response once.

You can pause the survey along the way and continue the response later.
What you have already answered will then still be available.

You can change your answers until the survey is sent, but once it's delivered, your answers are locked.

Thank you very much for your help!

* Mandatory

1

Where are you employed *

- ◯ Equinor
- ◯ Subcontractor company
- ◯ Hiring company
- ◯ Other

2

Which helicopter company do you primarily work for? *

- ◯ Bristow
- ◯ CHC
- ◯ Other

3

Have you switched between different helicopter companies? *

- ◯ Yes
- ◯ No
- ◯ Not applicable

4

In case you have changed companies, do you use different equipment?

- ◯ Yes
- ◯ No

5

In case you use different equipment, was new training provided?

- ◯ Yes
- ◯ No

6

If you need to elaborate on something related to training on equipment, you can answer here:

7

Does the range of personal protective equipment available today work as intended when it comes to flight suits/immersion suits?

- ◯ Yes
- ◯ No

8

Does the range of personal protective equipment available today work as intended when it comes to life jackets?

- ◯ Yes
- ◯ No

9

Does the range of personal protective equipment available today work as intended when it comes to underwear?

- ◯ Yes
- ◯ No

10

Does the range of personal protective equipment available today work as intended when it comes to helmets and headsets?

- ◯ Yes
- ◯ No

11

Does the range of personal protective equipment available today work as intended when it comes to shoes/boots?

- ◯ Yes
- ◯ No

12

If you have answered "No" to any of the questions about personal protective equipment above, you can elaborate on this here:

13

Do you have a dedicated life jacket in the SAR helicopter?

- ◯ Yes
- ◯ No

14

Do you know how often life jackets are checked?

- ◯ Yes
- ◯ No

15

If you know how often life jackets are checked, write this here:

16

Do you know the details of the functionality and trigger mechanism for the personal emergency beacon in the SAR helicopter?

- ◯ Yes
- ◯ No

17

If you know the trigger mechanism for the personal emergency beacon, how is it triggered?

18

Do you have a dedicated flight suit/survival suit in the SAR helicopter?

- ◯ Yes
- ◯ No

19

What is done with the immersion suit after use?

20

How is the immersion suit stored when not in use?

21

Who provide you with the immersion suit you use in the SAR helicopter?

- ◯ Equinor
- ◯ Helicopter Company
- ◯ Other Company

22

If you are provided with a survival suit from another company, you can write this here:

23

Do you know how often the survival suit is checked?

- ◯ Yes
- ◯ No

24

If you know how often the immersion suit is checked, you can write the interval here:

25

How do you regulate the use of personal protective equipment and clothing in summer/winter?

26

How do you regulate the use of personal protective equipment and clothing according to the type of assignment?

27

Is there equipment that is not currently defined as personal equipment that should have been personalized?

- ◯ Yes
- ◯ No

28

If you think there is equipment that should be personalized, what is your suggestion?

29

Is there anything you miss in relation to personal protective equipment?

- ◯ Yes
- ◯ No

30

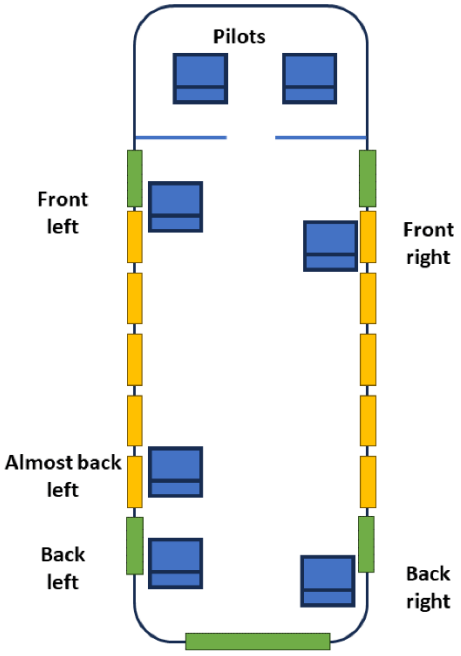
If there is something you miss in relation to personal protective equipment, what is your suggestion?

31

Where in the helicopter are you positioned during transport? (You can tick several options)

In the sketch on the right, the seats are shown in blue, primary emergency exits are shown in green, and windows are shown in orange

NB! The sketch is only intended as an illustration and does not have correct measurements!



- ☐ Front Left
- ☐ Front Right
- ☐ Almost Back Left
- ☐ Back Left
- ☐ Back Right
- ☐ Other

32

Where in the helicopter are you located during medical evacuation? (You can tick several options)

- ☐ Front Left
- ☐ Front Right
- ☐ Almost Back Left
- ☐ Back Left
- ☐ Back Right
- ☐ Other

33

Where in the helicopter are you positioned during training? (You can tick several options)

- ☐ Front Left
- ☐ Front Right
- ☐ Almost Back Left
- ☐ Back Left
- ☐ Back Right
- ☐ Other

34

If there are different placements depending on the type of training, you can elaborate on it here:

35

When are you strapped in and when are you loose in the SAR helicopter?

36

Do you know the term "monkey strap"?

- ◯ Yes
- ◯ No

37

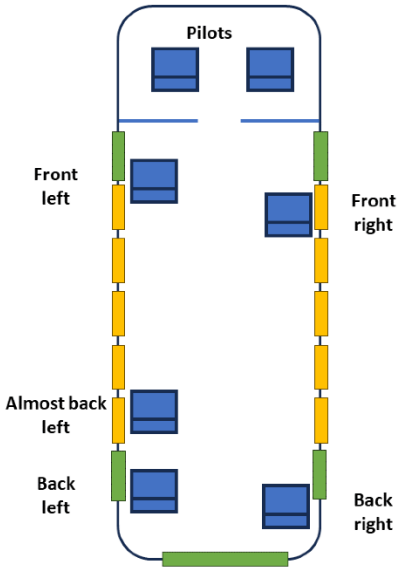
If you use a "monkey strap", when do you use it?

38

Is it immediately clear what your nearest evacuation route out of a helicopter is in an emergency?

In the sketch on the right, the seats are shown in blue, primary emergency exits are shown in green and windows are shown in orange

NB! The sketch is only intended as an illustration, and does not have correct measurements!



- [ ] Yes
- [ ] No
- [ ] Other

39

Is your nearest evacuation route always available in relation to your location in the cabin?

- [ ] Yes
- [ ] No
- [ ] Other

40

If your nearest evacuation route is not available, how do you deal with it?

41

How often do you participate in training exercises in the SAR helicopter?

42

What do you train on?

43

Have you participated in simulator training for SAR helicopters on land?

- ◯ Yes
- ◯ No

44

If you have participated in simulator training, how often?

45

How often do you practice using a breathing air system (SpareAir/HABD) in a pool?

46

How does today's training work relate to the use of breathing air systems?

47

Do you feel confident in the use of a breathing air system?

- ◯ Yes
- ◯ No

48

If you don't feel confident in the use of a breathing air system, why not?

49

When training in the pool, do you use the same immersion suit and life jacket used in the SAR helicopter?

- ◯ Yes
- ◯ No

50

When training in the pool, do you also use full equipment with protective equipment used in the SAR helicopter, including emergency beacons and helmets?

- ◯ Yes
- ◯ No

51

If you are not using full equipment with protective equipment, what equipment is not included?

52

Do you know the term CRM?

- ◯ Yes
- ◯ No

53

Have you participated in CRM training?

- ◯ Yes
- ◯ No

54

If you have participated in CRM training, write how often here:

55

Have you been followed up after the accident on 28 February?

- ◯ Yes
- ◯ No

56

If you have been followed up after the accident, who has done this?

- ☐ Equinor
- ☐ Other private company
- ☐ The public sector
- ☐ Other

57

If you have been followed up after the accident, how has the follow-up worked for you?

58

Do you have questions in relation to the accident that you think is important to shed light on in the internal Equinor investigation?

We must make reservations that the internal investigation will not go into **the causes of** the helicopter accident since this is something the Accident Investigation Board Norway, Bristow and the police will investigate."

59

How do you appreciate this way of getting involved? *

☆ ☆ ☆ ☆ ☆

App I Preflight plan for training trip with LN-OIJ 28.02.2024

Below is the preflight plan that was sent from the commander (pilot) of the LN-OIJ to SAR coordinator Oseberg prior to the planned exercise (**Ref /25/**). Names of people have been removed.

Aktuell preflight-plan (kopiert fra mail) for treningsturen 28/02-24:

Hi all,

Please see below the pre-flight training details, for more information login to your iSAR Tracker account.

Kind regards,
[redacted]

Date of Flight: 28th Feb 2024
Oseberg

Aircraft:	SAR 6
Endurance:	2 hrs 30 mins
Duration:	1 hrs 35 mins
Flight Rules:	VFR
Max Altitude:	1000
ETD:	17:20
Notes:	Depart ENBR west 15nm to drop beacon. P/U ship Wislon Twisteden in Hjeltefjord. Deliver GL, RM, SN, Stretcher and recovery. ly back west for search and recovery of beacon. RTB. Departure 18:20 local, scramble via ATC or SAT phone
POB:	[redacted]

Explanation of abbreviations in the plan:

VFR:	Visual Flight Rules, this basically means that a pilot can navigate using what he/she sees, i.e. without the help of instruments such as DME (navigation system that measures distance from aircraft to a DME station on the ground), VOR (radio navigation system for aircraft) or directing from air traffic controllers
ETD:	Estimated time of departure, not in local time, but UTC
ENBR:	Flesland Airport
P/U:	Pick-up
GL:	"Guideline" - line that is sent down to the receiver before starting hoisting
RM:	Rescuer
SN:	SAR Nurse
RTB:	Return to base, i.e. Flesland Airport
Scramble:	Mobilize
ATC:	Air Traffic Control
Sat:	Satellite

App J Course to improve mastery of helicopter trips

Below is a description of the external course available to Equinor employees (**Ref /86/**) (*only available in Norwegian*).

Helikopterkurs

INTERNATIONAL SOS

Mange opplever uro, ubehag eller bekymringer når de skal fly helikopter til og fra jobb i Nordsjøen.
International SOS har utviklet et helikopterkurs som skal hjelpe offshorearbeidere å mestre helikopterturen bedre.

Industri Energi, i samarbeid med Bergens Tidende, gjennomførte i 2016 en spørreundersøkelse blant forbundets medlemmer, i etterkant av helikopterulykken på Turøy. 3400 svarte på undersøkelsen.

- Hele 45 prosent svarer at de har opplevd frykt eller ubehag på helikopterturen
- Nesten 20 prosent opplever frykt eller ubehag omtrent annenhver gang de flyr med helikopter
- Over 6 prosent svarer at de er redd hver gang de flyr offshore
- Over 30 prosent svarer at de har opplevd en uønsket hendelse i forbindelse med helikopterturene

For å melde deg på og registrere deg for kurset, **klikk her**

WORLDWIDE REACH. HUMAN TOUCH https://internationalsos.no/contact/

Om Kurset

Kurset ledes av både en svært erfaren helikopterpilot og en psykolog. I løpet av kurset vil du lære om helikopter, helikopterflyging og hvordan lufttrafikken er organisert.

Du vil også lære om egne reaksjoner og få konkrete mestringsstrategier for å få en bedre opplevelse av helikopterturen.

Kurset kan bygges på med individuell oppfølging i forbindelse med utreise/innreise offshore og eventuelt eksponering/flyging i helikopter ved ønske/behov.

Selve kurset passer alle, også de som primært ønsker å få mer kunnskap om helikopterflyging og psykologiske mestringsstrategier.

Kursholdere

Tony Hammerstad

Helikopterpilot i Norsk Luftambulanse. Har vært sjefspilot i Bristow Norway AS og har flydd helikopter for offshorepersonell i Nordsjøen i 8 år.

Stian Midtgård

Klinisk arbeidspsykolog med bred erfaring innen utbrenthet, stress, bekymringer, angst, depresjon og belastningsmestring Anerkjent og mye brukt kursholder.

Kurset

- 6 timer inkludert lunsj
- Psykologisk tilnærming til egne reaksjoner samt mestring av disse
- Helikopterteknisk og lufttrafikk
- Refleksjoner rundt alle tema

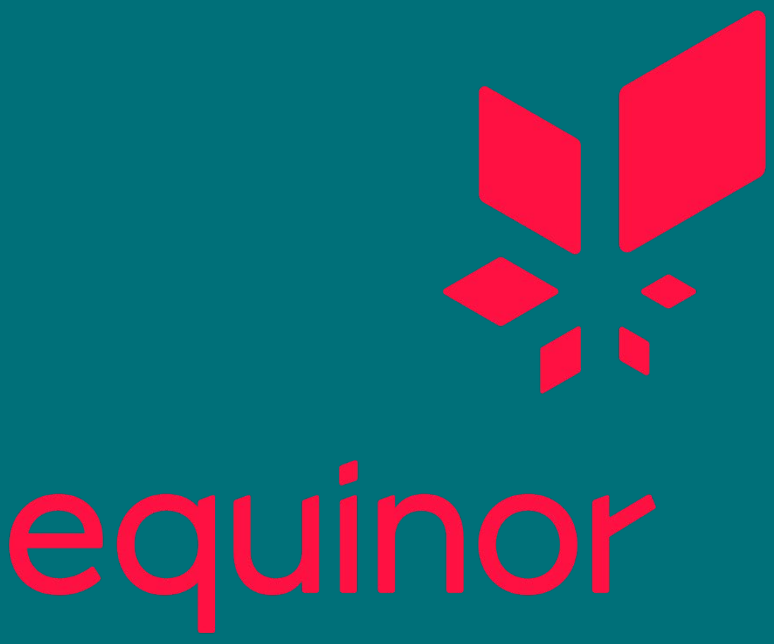
Mulig oppfølging i etterkant

- Individuelle samtaler ifm ut- og innreise
- Eksponering i helikopter

For å melde deg på og registrere deg for kurset, **klikk her**

WORLDWIDE REACH. HUMAN TOUCH

https://internationalsos.no/contact/



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