

# R&D-Report

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## Organizing emergency response in the European Arctic: A comparative study of Norway, Russia, Iceland and Greenland MARPART Project Report 5

Editors:

Natalia Andreassen

Odd Jarl Borch

Emmi Ikonen

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Nord University  
R&D-Report no. 46  
Bodø 2019

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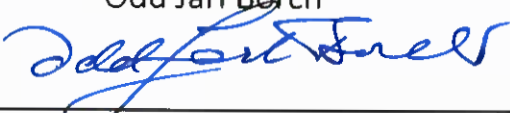
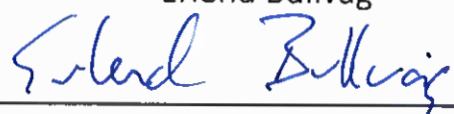

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<b>Summary:</b> The report examines the emergency preparedness systems of Norway, Russia, and Iceland in the fields of search and rescue (SAR), oil spill response, firefighting and violent action at sea. Within each country and each field, the report introduces the main maritime emergency preparedness and response institutions with their organizational models, responsibilities and main operational patterns.	<b>Keywords:</b> Emergency preparedness system Organizational structures Operational patterns Search and Rescue Oil Spill Response Firefighting at sea Violent action at sea Response Capabilities Emergency management roles and responsibilities Arctic High North	



# MARPART

INTERNATIONAL R&D PARTNERSHIP ON MARITIME  
SAFETY AND SECURITY IN THE HIGH NORTH

The report is developed under the project:

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- Nord University
- Project partners' own contribution

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- High North Center at Nord University Business School (Norway)
- Norwegian Defense University College (Norway)
- Norwegian Police University College (Norway)
- UIT-the Arctic University of Norway (Norway)
- University Center in Svalbard (Norway)
- University of Greenland (Greenland)
- University of Iceland (Iceland)
- Northern (Arctic) Federal University (Russia)
- Murmansk State Technical University (Russia)



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Norwegian Ministry  
of Foreign Affairs



Nordland  
FYLKESKOMMUNE



NORWEGIAN INSTITUTE  
FOR DEFENCE STUDIES



UNIVERSITY OF ICELAND



POLITIHØGSKOLE





## THE MARPART RESEARCH CONSORTIUM

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MARPART – a project on the management, organization and governance of cross-border collaboration on emergency operations in the High North.

The key purpose of the Marpart research is to increase the understanding of the emergency management challenges in the Arctic sea areas. Our work includes an assessment of the risk related to different types of maritime activity in the High North and an overview of the responsibilities of the preparedness institutions of Norway and its neighboring countries. We focus on cross-institutional and cross-country partnerships between government emergency response agencies as well as private companies in the Arctic region.

The starting point of this research has been the responsibility of the governments as to safety, security and environmental protection in the High North. Maritime preparedness is defined as the system for emergency prevention, preparedness and response. We look into the need for enhanced measures to respond to composite challenges including search and rescue (SAR), oil spill recovery, firefighting and salvage, and actions against terror or other forms of violent and destructive action.

MARPART project goals:

- To reveal the needs for preparedness related to joint emergency response operations within the preparedness system of the included countries;
- To provide analytical concepts for studying coordination challenges in cross-border, combined operations;
- To contribute with organizational concepts for inter-organizational partnership and management within emergency response.

The cross-disciplinary, international research network established for the Marpart project consists of 16 universities and research institutes. The consortium is coordinated by Nord University in Bodø, Norway. Universities, police and naval academies and research institutes from Norway, Russia, Iceland, Greenland, Denmark and Sweden are now part of the Marpart network. In addition, universities from Canada, USA, and Finland are part of an extended academic network called the UArctic thematic network on Arctic Safety and Security. The project partners have established Advisory Boards in each country including government preparedness authorities and industry representatives. The Marpart projects include two interlinked projects: Marpart 1 “Maritime Preparedness and International Partnership in the High North” and Marpart (2)-MAN “Joint-task Force Management in High North Emergency Response”. These projects have also been closely linked to the Norwegian SARINOR project focusing on gaps in the Norwegian Arctic SAR system.

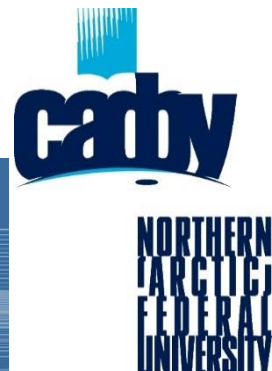
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## ABBREVIATIONS

**ACO** – Aircraft Coordinator  
**AIS** – Automatic Identification System  
**ATC** – Air Traffic Control  
**BEAC** – Barents Euro-Arctic Council  
**BIRK** – Reykjavik Airstrip  
**CBRN** – Chemical, Biological, Radiological and Nuclear materials  
**CPEM** – NCIP’s Department of Civil Protection and Emergency Management  
**DCP** – District Chief of Police  
**DSB** – Directorate for Civil Protection  
**EAI** – Environment Agency of Iceland  
**EEZ** – Exclusive Economic Zone  
**EMERCOM** – Ministry of the Russian Federation for Affairs for Civil Defense, Emergencies and Elimination of Consequences of Natural Disasters  
**EMCC** – Emergency Medical Communication Centre  
**EMS** – Emergency Medical Services  
**EPPR** – Emergency, Prevention, Preparedness, and Response  
**FIR** – Flight Information Region  
**FLO** – Fire Liaison Officer  
**FOH** – Norwegian Joint Headquarters  
**FORF** – Frivillige Organisasjoners Redningsfaglige Forum  
**GMDSS** – Global Maritime Distress and Safety System  
**HNS** – Host Nation Support  
**IAMSAR** – International Aeronautical and Maritime Search and Rescue  
**ICAO** – International Civil Aviation Organization  
**ILKO** – In Norwegian: Innsatsleders Kommandoplass (Unified Command Centre)  
**IM** – Incident Management  
**IMO** – International Maritime Organization  
**ICA** – Iceland Construction Authority  
**ICG** – Icelandic Coast Guard  
**ICS** – Incident Command System  
**IMA** – Icelandic Maritime Administration  
**ITA** – Icelandic Transport Authority  
**ITU** – International Telecommunication Union  
**IUA** – Inter-municipal Emergency Response Committee  
**JAC** – Joint Arctic Command  
**JRCC** – Joint Rescue Coordination Centre  
**KSN** – the Greenland Police Command Station  
**MCC** – Mission Control Centre  
**MEDEVAC** – Medical evacuation  
**MIA** – Ministry of Internal Affairs  
**MIRG** – Maritime Incident Response Group  
**MRCC** – Maritime Rescue Coordination Centre  
**MRI** – Marine Research Institute  
**MRO** – Mass Rescue Operation  
**MRSC** – Maritime Rescue Sub-Centre  
**NATO** – the North Atlantic Treaty Organization



**NCA** – Norwegian Coastal Administration  
**NCIP** – National Commissioner of the Icelandic Police  
**NMA** – Norwegian Maritime Authority  
**NOFO** – Norwegian Clean Seas Association for Operating Companies  
**NORDRED** – Nordic cooperation between the rescue services  
**OSC** – On-Scene Coordinator  
**PBS** – Police Emergency Response System  
**PLIVO** – Ongoing life-threatening violence (In Norwegian: Pågående livstruende vold)  
**PST** – Police Intelligence Service in Norway  
**RCC** – Rescue Coordination Centre  
**RS** – Norwegian Society for Sea Rescue (Redningsselskapet)  
**RSC** – Rescue Sub-Centre  
**SAR** – Search and Rescue  
**SC** – Search and Rescue Coordinator  
**SHS** – Reykjavik Capital District Fire and Rescue Service  
**SITREP** – Situation Report  
**SMC** – Search and Rescue Mission Coordinator  
**SOLAS** – International Convention for the Safety of Life at Sea  
**SOP** – Standard Operating Procedure  
**SRR** – Search and Rescue Region  
**SRU** – Search and Rescue Units  
**SST** – National Co-ordination and Command Center  
**STCW** – International Convention on Standards of Training, Certification and Watchkeeping for Seafarers  
**TETRA** – Terrestrial Trunked Radio  
**USSoEPR** – Unified State System of Emergency Prevention and Response  
**VHF** – Very High Frequency  
**VTS** – Vessel Traffic Service

## EXECUTIVE SUMMARY

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This report examines the emergency preparedness systems of Norway, Russia, Iceland, and Greenland in the fields of search and rescue (SAR), oil spill response, firefighting and violent action at sea. Within each country and each field, the report introduces the main maritime emergency preparedness and response institutions with their organizational models, responsibilities and main operational patterns. We compare the different institutions and agencies within SAR, oil spill response, firefighting, and violent action at sea across the countries and examine variations in organizational structures, roles, responsibilities, command structures, and operational patterns. By exploring the key challenges for each sector and nation, the report also aims to address how multi-sectoral and multi-national cooperation may increase the response capabilities in severe crises and in sea areas where resources are scarce.

Emergency preparedness and response, and especially large-scale maritime operations in the Arctic context require robust cooperation between various agencies. Due to limited access to resources, long distances to urban areas, as well as weather and other factors that may hamper logistics it may also demand assistance from neighboring countries. The so-called host nation support system may provide access to a broader range of resources and experienced and competent key personnel. Large-scale maritime incidents may involve major oil spills, mass rescue operations, ship fires, hazardous and noxious substance incidents, violent action incidents, and other types of operations. The response system capacities of one country are often not sufficient to respond to large scale the incident and action over a longer time span. Not the least, bringing resources from other regions to solve a major emergency there is a need to add resources so that other emergencies that may appear during this operation is experiencing adequate response. Thus, major incidents quite fast become multi-agency, nationwide and possibly international.

During the last years, significant efforts have been made towards designing transparent systems of response across borders. This has been important in the Arctic context where the Arctic Council and the Arctic Coast Guard Forum have worked through their working groups to create common standards. International organizations and especially the International Maritime Organization (IMO) regularly improve the standardized SAR structures for several levels of decision making in the IAMSAR manual based on the Convention for the Safety of Life at Sea (SOLAS). However, challenges are present in providing knowledge of contextual challenges, capabilities and competence on response to large-scale incidents that seldom appears. Even though procedures are available for major disasters calling for mass evacuation, the “black swans” may call for significant resources not available within a single region or country. An efficient assistance from neighboring countries may be crucial in order to achieve fast and adequate response in the remote parts of the Arctic. This is especially true for helicopter resources as the most adequate tool in remote areas, especially in case of mass casualties.

All mission coordinators, on-scene coordinators, and other incident commanders should have sufficient knowledge and expertise related to Arctic conditions in order to lead missions

effectively. For the vessels sailing in the Arctic waters it is important that the crew is trained to support the tasks of the assigned on-scene coordinator or incident commander at sea. The required training in the IMO STCW convention is in this respect very limited. Knowledge of regional resources, capacity of neighboring countries' emergency response agencies, as well as knowledge of operational procedures, routines, management roles and functions are important in order to avoid delays and to maximize efficiency. Several international meetings and exercises within the emergency preparedness authorities in Arctic countries have shown that there is a need for further understanding and familiarization with each other's systems, organizations and contingency plans. This also includes courses and training for the vessel captain and officers serving as the search and rescue on-scene coordination (OSCs) and Search Rescue Unit (SRU).

Roles, responsibilities and operational patterns for **search and rescue** in Norway, Russia, Greenland, and Iceland are very similar due to especially the International Aeronautical and Maritime Search and Rescue (IAMSAR) manual regulations and other international IMO conventions. However, familiarizing with each other's organizations, capabilities and contingency plans, especially for large-scale incidents is crucial to achieve efficient coordination in all management levels and to avoid confusion. Large-scale maritime SAR incidents in the Arctic may result in an overload in the normal emergency response system especially considering limited resource availability, long distances and complexity of the Arctic environment. Multinational joint operations in the Arctic may face the same difficulties as multi-sectoral national operations with challenges on communication, different organization cultures, procedures, and working patterns. Further cooperation through exercises, development of common guidelines and standard operating procedures would increase knowledge and the efficiency of inter-organizational coordination.

A major **oil spill** in the Arctic region will strain a country's response capabilities. As a consequence, there are several bilateral agreements on oil spill response cooperation and assistance in the Arctic. The Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic (MOSPA agreement) covers cooperation between all the Arctic countries. Although the MOSPA agreement, international conventions and other bilateral agreements set the standards for oil spill response, all countries have their own system and procedures for oil spill response. The Arctic countries also have a rather complicated organizational structure with many levels of responsibility and a mix of government and private resources. This calls for increased focus on interaction challenges and differences when it comes to organization and management. The introduction of the standardized organizational set up as well as adjoining procedures within the so-called Incident Command System makes integration of several forces easier. However, in large-scale operations adaptation and use of all resources at hand are important. This calls for training and realistic exercises that illuminates the whole range of resources available in the region. Also, the special context of the Arctic may call for adaptations of the standardized procedures when it comes to authority and roles. Exchange of experiences, evaluations and efforts to improve the management systems may be looked at in a more systematic way.

**Ship fires** are high risk incidents, with high probability and dramatic consequences for people, values and the environment. Fast response is crucial and dispatching specialized teams for smoke diving described as Maritime Incident Response Groups (MIRG) may take time. This type of action is exhausting, and reinforcements have to be at hand. Fast mobilization and team integration are important. Also, joint efforts between the crew safety team onboard the vessel in distress and the MIRG teams are of special importance.

The systems for firefighting at sea in Iceland, Russia and Norway are rather different and therefore, joint training is important. Through familiarization programs and joint projects, one may develop firefighting procedures and common systems for communication and coordination that are easy aligned and managed.

Violent action and especially terrorist acts are the most challenging tasks as they may involve all elements above and in addition shooting response. Deeper analysis of operational patterns and roles between institutions for **violent action incidents** is complicated due to lack of publicly available information on counterterrorism and violent action. Procedures and tools are often classified. Military forces play an important role in several countries, and political tensions may hamper cooperation. The police and the border guards play an important role in this field, and there are efforts towards closer cooperation. There is frequent information exchange across borders about possible threats. An important issue is procedures for cooperation between police and special forces related to intelligence and coordinated action, and step by step involvement of the emergency response teams from paramedics and fire brigades in such actions, such as in the Norwegian Ongoing life-threatening violence procedure (PLIVO). The number of casualties may be high, attacks may happen in several places and follow each other. Fast intervention, first-line aid and medevac are imperative. In a maritime environment, difficult access and limited resources available add to the task complexity and the need for cooperation skills and transparent procedures, not the least in the inbound and outbound logistics.

Combined operations with all the above mentioned sectors in the Arctic maritime domain will be complex due to various command, control and coordination structures between agencies and countries and challenges of the There is still further need to familiarize with neighboring countries systems, roles and responsibilities as well as plans and procedures of various agencies responsible of emergency response, and joint training in command, control and coordination especially when it comes to joint-operations across different sectors. Increased realism in training and exercises may provide the necessary competence and capabilities at all management levels to deal with combined operations with cross-border support.

# Introduction

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## **Background**

A large-scale maritime incident in Arctic waters may have dramatic consequences for people, the environment, commercial values and communities. Limited emergency preparedness resources, limited infrastructure and long distances call for robust collaboration and coordination from all emergency preparedness authorities, the maritime industry and the communities in the Arctic region. The emergency response coordinators have to take into consideration a number of Arctic-specific challenges. In large-scale operations coordination and communication between various command levels and stakeholders is crucial but can be challenging where different types of organizations and preparedness systems are involved. The involved stakeholders may have different types of command structures and employ different coordination mechanisms. Knowledge about possible challenges regarding command and control can contribute to better coordination dynamics.

## **Objective**

To increase understanding of management systems between institutions and countries, this report provides a picture of the preparedness agencies' organizational designs and operational management patterns related to search and rescue (SAR), oil spill response, firefighting and violent action at sea in Norway, Russia, and Iceland. The report compares differences in institutional design, operational management patterns, operational hierarchy, command systems, and operating procedures.

The aim of this report is to increase emergency response insight and highlight collaboration challenges due to differences in organization, management and operational patterns.

## **Report structure and contents**

Each country section in this report begins with a description of the emergency preparedness value chain. We focus on the preparedness institutions with the main coordination responsibility. We also describe how the main institutions are organized and what organizational principles are used for their command systems or operational systems including IAMSAR, the Incident Command System, military structures and more tailor-made models for a service. Linked to the command systems of each country and sector, the report also gives a more detailed overview of the command chain in operations including the key management roles and responsibilities at strategic, operational and tactical levels. The report also describes national and international standard operating procedures and plans for operations when available for each sector. Finally, in the conclusion the report attempts to compare operational patterns between institutions and countries.

## **Methodology**

This report is based on in-depth qualitative studies of the emergency management system in the countries included. Data for the report is gathered from various primary and secondary sources including interviews, exercise observations, exercise reports, seminar presentations, incident analyses, and studies of the standard plans and procedures of the main preparedness institutions.

Existing literature and project results on Arctic maritime emergency preparedness and safety have been mapped and reviewed, including academic papers, project reports, government publications and websites, as well as news articles and press releases.

This study is undertaken within the international research and development project MARPART, focusing on maritime preparedness and partnership in the High North. The analysis is conducted in collaboration with project partners and institutions in Norway, Iceland, and Russia, and draws on the expertise of the different agencies and authorities within preparedness system in the participating countries.

# Norway

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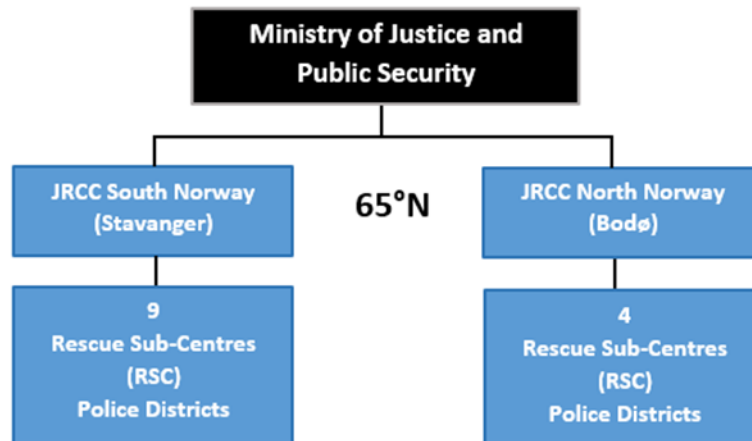
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## 1.1 Search and Rescue

### 1.1.1 Main institutions in the preparedness value chain

Norwegian rescue services are carried out through cooperation between civilian and military government agencies, voluntary organisations and private companies contributing with resources appropriate for rescue services. The formal organization of Norwegian search and rescue system is laid down in the Royal Resolution (2015) "Organization of Rescue Services". The Ministry of Justice and Public Security has the overall governing and administrative responsibility for public safety and security including search and rescue (SAR) in the Norwegian preparedness system. The ministry is responsible for the preservation and development of basic guarantees of the rule of law and action within the police, SAR organizations and firefighting institutions. The ministry has two main departments governing emergency preparedness; the Police department with its Police Directorate, and the Department of public security (Ministry of Justice and Public Security, 2015a). The Department of public security is coordinating two subordinate directorates; the Directorate for Civil Protection (DSB) and the Joint Rescue Coordination Centres (JRCC). DSB is the responsible authority in Norway that coordinates the municipal fire department rescue service. The core management organizations of the Norwegian SAR system are the police districts and the two Joint Rescue Coordination Centres in South Norway and North Norway.

The Police in Norway is responsible for initiating and organizing emergency management efforts where human life or health is threatened, provided that no other agency has been delegated this responsibility (Police Directorate, 2011). The police also has the responsibility for coordinating emergency management across various sectors. The Joint Rescue Coordination Centres have the overall operational responsibility to coordinate rescue operations in the Norwegian search and rescue region (SRR) (Ministry of Justice and Public Security, 2018). Operations are coordinated from the two operational centres in Stavanger (South-Norway) and Bodø (North-Norway), or from one of the 13 rescue sub-centres managed by the Police, one in each police district (Hovedredningsentralen, 2018a). JRCC North-Norway is responsible for coordinating search and rescue also in the area of Svalbard. The Governor of Svalbard is a subordinate agency under the Ministry of Justice and Public Security's Polar Affairs department. He serves as head of police and is responsible for preparedness measures in Svalbard. Svalbard also has a rescue sub-centre managed by the police in Svalbard (Governor of Svalbard, 2016).



**FIGURE 1. THE MAIN STRUCTURE OF THE SAR SYSTEM IN NORWAY WITH RESPONSIBILITY BORDER**

The Norwegian government Royal Decree (FOR-2015-06-19-677) on the Organization of Rescue Services also defines the organization and routines for cooperation, management, coordination, responsibility and tasks of the Norwegian SAR system. The Police emergency response system manual (PBS) defines the police’s responsibilities in emergency management. In addition to the national SAR plan and regulations, Norway is dedicated to abide international conventions and standards for SAR services set by the International Maritime Organization (IMO) and International Civil Aviation Organization (ICAO); International Convention on Maritime Search and Rescue (IMO, Hamburg Convention) and the Convention on International Civil Aviation with its Annex 12 (ICAO, Chicago Convention), set international regulations for SAR services. The International Aeronautical and Maritime Search and Rescue Manual (IAMSAR Manual), published by the IMO and the ICAO is based on the Hamburg Convention and the Chicago Convention. The IAMSAR Manual contains practical guidelines for the organization of maritime and aeronautical SAR, mission coordination, operations of search and rescue units (SRUs) and provision of SAR-related training. The manual is not binding but provides an internationally accepted foundation for the appropriate provision of maritime and aeronautical SAR services (IMO and ICAO, 2016a).

Other international agreements relevant to SAR are the International Convention for the Safety of Life at Sea (SOLAS), the International Ship and Port Facility Security-code (ISPS), the STCW Convention – International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, the International Convention on Standards of Training, Certification and Watchkeeping for Fishing Vessel Personnel (STCW-F), the recent Polar Code, as well as other IMO conventions with a special focus on safety, security and SAR responsibility of vessels. For the Arctic region, the eight Arctic countries have signed an *Agreement on cooperation on aeronautical and maritime search and rescue in the Arctic* under the auspices of the Arctic Council. Norway has also signed bilateral agreements on SAR with the neighboring countries. JRCC North Norway is represented in the Arctic Council’s Emergency Prevention, Preparedness and Response (EPPR) working group where SAR questions are discussed.



The Norwegian Maritime Authority (NMA) is responsible for coordinating the IMO regulations in Norway. NMA is subordinate to the Ministry of Trade, Industry and Fisheries and its Maritime Department. The Ministry and the Norwegian Maritime Authority appoint and manage Norwegian delegations to the IMO committees. Most of the work on safety at sea occurs in the main committee, the Maritime Safety Committee, and the sub-committee, Navigation, Communication, and Search and Rescue. Representatives from one or both of the JRCCs attend the sub-committee meetings. NMA also participates in the European Maritime Safety Agency's work and coordinates EU maritime regulations with the Ministry. (NMA, 2018)

The Norwegian Civil Aviation Authority together with the Ministry of Transportation and Communications are responsible for coordinating the ICAO regulations and the Annex 12 of the Chicago Convention. The Civil Aviation Authority is managed by, and reports directly to the Ministry.

### **Joint Rescue Coordination Centres**

The two Joint Rescue Coordination Centres in Norway have the main operative responsibility for coordinating maritime, aeronautical and land SAR incidents within Norway's search and rescue region (SRR). The basic principle of having two JRCCs in Norway, is that they can act as a backup for each other ensuring the use of total state capacities during incidents. According to the principle, either of the JRCCs can support or take command of the other centres tasks if the situations requires so. The JRCCs will normally delegate coordination of land rescue to one of the rescue sub-centres.

JRCC North-Norway coordinates SAR incidents above 65 degrees north, including Svalbard. If the SAR incident is on or close to the border line between adjacent JRCCs, the JRCCs involved will select one to assume coordination of the SAR operations. The search and rescue region of JRCC NN covers about 80% of Norway's SRR and borders to the Icelandic, Danish, Russian, Finnish and Swedish SRR and flight information regions (FIR) (Hovedredningsentralen, 2018a).



**FIGURE 2. THE OPERATION CENTER OF JRCC NORTH NORWAY (PICTURE: JRCC NN)**

The JRCCs are responsible for coordinating resources, maintaining interaction and communication and ensuring efficient SAR operations during incidents. According to the Royal Decree (2015), the JRCCs are authorized to use all suitable and available resources of government agencies (Ministry of Justice and Public Security, 2015a). The JRCCs can deploy available resources belonging to the fire brigades, public health services, the Civil Defence, the Police, Norwegian Coastal Administration (NCA), and the Air Traffic Service for SAR operations. They also utilize resources from voluntary and private organizations. The Chief of Police heading the JRCC may request resources from the armed forces through The Norwegian Joint Headquarters (FOH) according to a special regulation concerning armed forces assistance to the police (FOR-2017-06-16-789).

Each JRCC is headed by the Chief of Police (Sør-Vest for JRCC SN and Nordland for JRCC NN). As head of the JRCC, he reports directly to the Ministry of Justice and Public Security not to the Directorate of the Police as they normally would in their positions as Chiefs of their Police Districts. A National SAR Management Board lead by the Chief of Police is established for each of the JRCCs. The Management Board is gathered in the case of large and extraordinary incidents. If gathered, the Management Board will lead the response at the strategic level. The Board includes representatives from the Directorate for Civil Protection (DSB), the Armed Forces, the Civil Aviation Authority, Norwegian Coastal Administration (NCA), Norwegian Maritime Authority, the Norwegian Communication authority, and the Directorate of Health. In addition, the Board may include representatives from the Avinor, Telenor Maritime Radio,

FORF - the organisation for the volunteer rescue services in Norway, and the Norwegian Society for Sea Rescue (Redningssekskapet, RS). The JRCCs can also call upon advisors with special competence if needed (Hovedredningsentralen, 2018b).

In addition to coordinating maritime, aeronautical and land SAR, the JRCCs in Norway are also responsible for SAR Agency functions together with the ministry, and monitoring, receiving and processing COSPAS-SARSAT messages and signals (JRCC Stavanger also receives and processes Inmarsat signals).

The coordination of the majority of inland SAR incidents is delegated to the rescue sub-centres (RSC), unless the incident requires JRCC coordination. Incidents where the JRCC would not delegate the task to RSC could for example be a land SAR case where the main resource used is the SAR helicopter (i.e. some mountain rescue cases), an incident with a search area that stretches over more than one RSC area where the JRCC would decide which RSC takes the lead or retain the lead at the JRCC, a demanding incident with several resources involved, an incident involving international coordination or if the RSC is not capable of handling the SAR case due to a high number of parallel cases. (Hovedredningsentralen, 2018a; Ministry of Justice and Public Security, 2015a)

### **Police**

According to the Law of the Police, the police force has a duty to initiate and organize emergency response efforts where human life or health is threatened, provided that no other agency has been delegated this responsibility. The police also has the responsibility to coordinate the management of emergency situations across various sectors. The Police emergency response system manual (PBS) is vital for fulfilling this responsibility. The law states that the Police must always launch emergency response operations until another organisation takes command. (Police directorate, 2011)

The Norwegian police force has recently been divided into 12 regional police districts (13 including the Governor of Svalbard). Each police district is responsible for the operational management of the overall emergency response resources within their area of jurisdiction. For land-based SAR incidents, one of the 13 rescue sub-centres (RSC) is mobilized and established by the police, in dialogue with the JRCC, to coordinate the operation. The RSCs are connected to the police districts in Norway: Agder, Finnmark, Innlandet, Møre og Romsdal, Nordland, Oslo, Sør-Vest, Sør-Øst, Troms, Trøndelag, Vest, Øst, and to the governor of Svalbard (Politiet, 2018). The Chiefs of each Police District are heads of the RSCs. In this role they report to the JRCC. The RSC is established every time there is a SAR operation within the RSC area of responsibility which normally coincides with the Police District or Svalbard. RSC is a collaborative centre with representatives from all the main SAR actors in the RSC area of responsibility. Although, the RSC will normally operate from the operational centre of the police district and is manned by the police officers on duty without the assistance of the other members of the SAR management board. In larger events, the Police operational centre serving as RSC will have support from the staff of Chief of Police. The Chief of Police or some of the members may decide to mobilized the local SAR Management Board with the most

important partners within the SAR operation with representatives from Avinor- the state-owned operator of airports in Norway, the Fire and Rescue Services, the Armed Forces, the volunteer organizations, The County Governor, the Health Directorate, the Coastal Administration and The Norwegian Civil Defence - the State's reinforcement for the emergency and rescue departments in the event of major accidents and special incidents.

**The Governor of Svalbard**

The Governor of Svalbard is responsible for emergency response in Svalbard area. The Governor also serves as chief of police. The SAR system works in quite a similar way as on the Norwegian mainland, with some adjustments. Maritime and aeronautical SAR operations and major incidents are coordinated by JRCC NN, and land SAR operations by the RSC in Svalbard. The head of the RSC is the Governor of Svalbard (Governor of Svalbard, 2016a; JRCC NN, 2017). Figure 3 explains the organizational structure of the Governor of Svalbard.

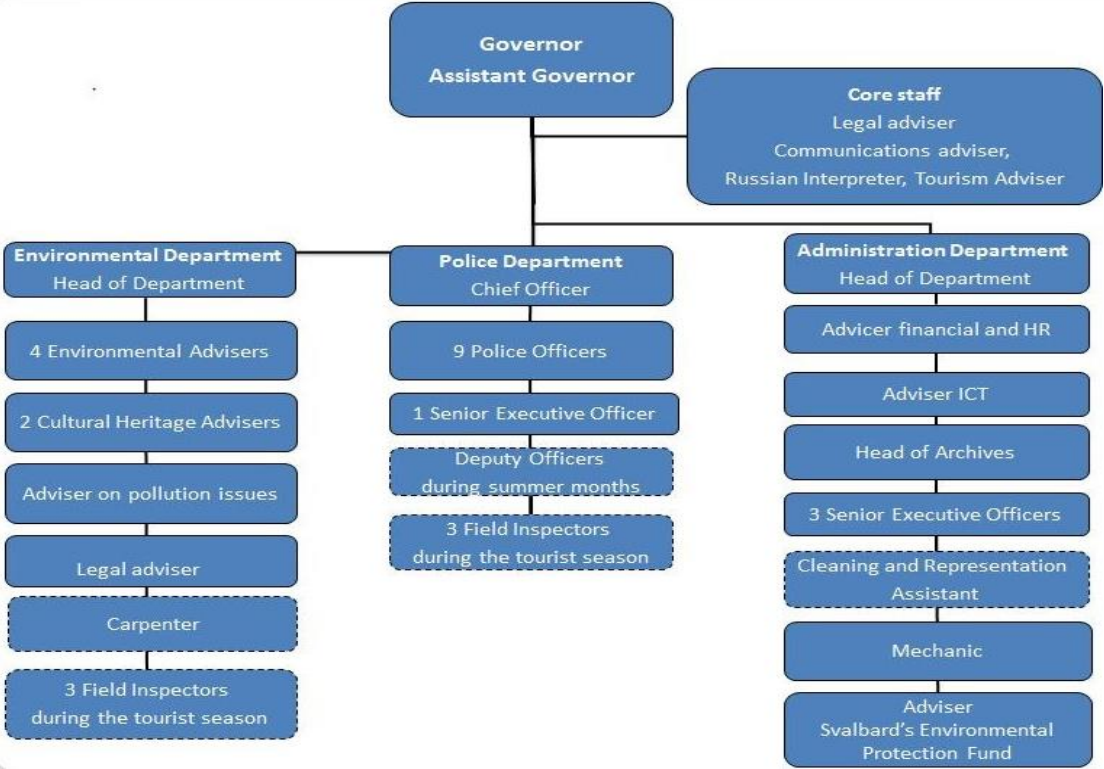


FIGURE 3. GOVERNOR OF SVALBARD ORGANIZATION CHART (SOURCE: GOVERNOR OF SVALBARD, 2016B)

The representation in the local SAR Management Board will be different from the mainland reflecting long distances from the mainland, and the need for mobilization of the local resources available. The police department of the governor also have a limited number of persons employed. This may call for differences in the manning of the Rescue Sub-Centre (RSC) functions compared with the larger police districts in mainland Norway.

**Other main institutions**

The Norwegian Coast Guard has a major role in providing additional resources and on-scene coordination in the Arctic. The Coast Guard is available all along the coast, including frequent

presence in the Svalbard region. If available, the captain of a coast guard vessel will serve as on-scene-coordinator (OSC) and the vessel may also take the Air Coordinator (ACO) role.

Other important stakeholders are the university hospitals, the Armed Forces, the Norwegian Civil Defense reinforcement, the Air Ambulance helicopters and paramedics, the Norwegian Society for Sea Rescue, Red Cross, the fire and rescue brigades, the Norwegian Coastal Administration, as well as the private operators and vessels that are in the area of the incident.

### 1.1.2 Organization and management at strategic level

On a national political level, the Ministry of Justice and Public Security governs the main institutions coordinating SAR activities in Norway through the Police department, the department for public security, and the polar affairs department (with matters related to Svalbard). The department of public security is divided into two subordinate agencies; the Directorate for Civil Protection (DSB) and the Joint Rescue Coordination Centres (JRCC). Within the department of Public Security, the Emergency Support Unit (in Norwegian: Krisestøtteenheten) is a part of the central emergency management system in Norway. The Emergency Support Unit provides information and advice for the Ministries and the Crisis Council (in Norwegian: Kriserådet), which is the highest coordinating body at administrative level. The Police Department is divided into two subordinate agencies; The National Police Directorate and The Norwegian Police Security Service. The ministry coordinates state emergencies closely with other ministries (Ministry of Justice and Public Security, 2018; 2015a)

The Police and the Joint Rescue Coordination Centres act under and are responsible to the Ministry (Hovedredningsentralen, 2018b). Figure 4 illustrate the organizational structure of the national SAR services and the National SAR Management Board.

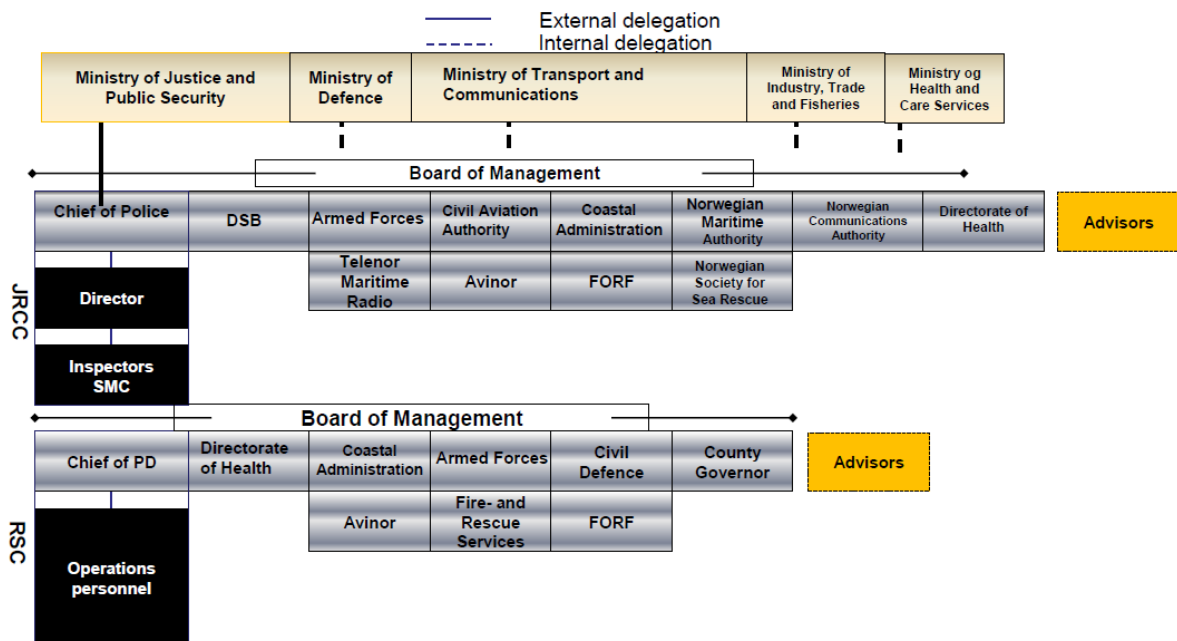


FIGURE 4. SAR ORGANIZATION IN NORWAY (SOURCE: JAMTLI, 2017)

The National SAR Management Board receives its mandate and is responsible from the Ministry of Justice and Public Security. The management board consists of various authorities that coordinate and participate in national emergency preparedness and response. The members are obligated to assist the SAR efforts within their authority and in their area of expertise. The members must be familiar with the main principles of the Norwegian emergency preparedness system and crisis management; responsibility, equality, subsidiarity and cooperation principles. The National SAR Management Board members will approve, deploy and must be updated on the available resources within their area of expertise that can be utilized in emergency operations and incidents, and must therefore represent the appropriate management level of their agencies/organizations. The SAR Management Board meets bi-annually.

The Regional SAR Management Board<sup>1</sup> comprises key stakeholders and resources for inland SAR. The boards include representatives from the National Health Directory, Norwegian Coastal Administration, the Armed Forces, Civil Defence, and the County Governor's emergency preparedness organisation. Avinor, the fire and rescue services, and the volunteer organizations (FORF) can also take part in the Committee if required. Based on local circumstances, adaptations to this can be made given the approval from the JRCCs. (Ministry of Justice and Public Security, 2015a; 2015b; 2015c).

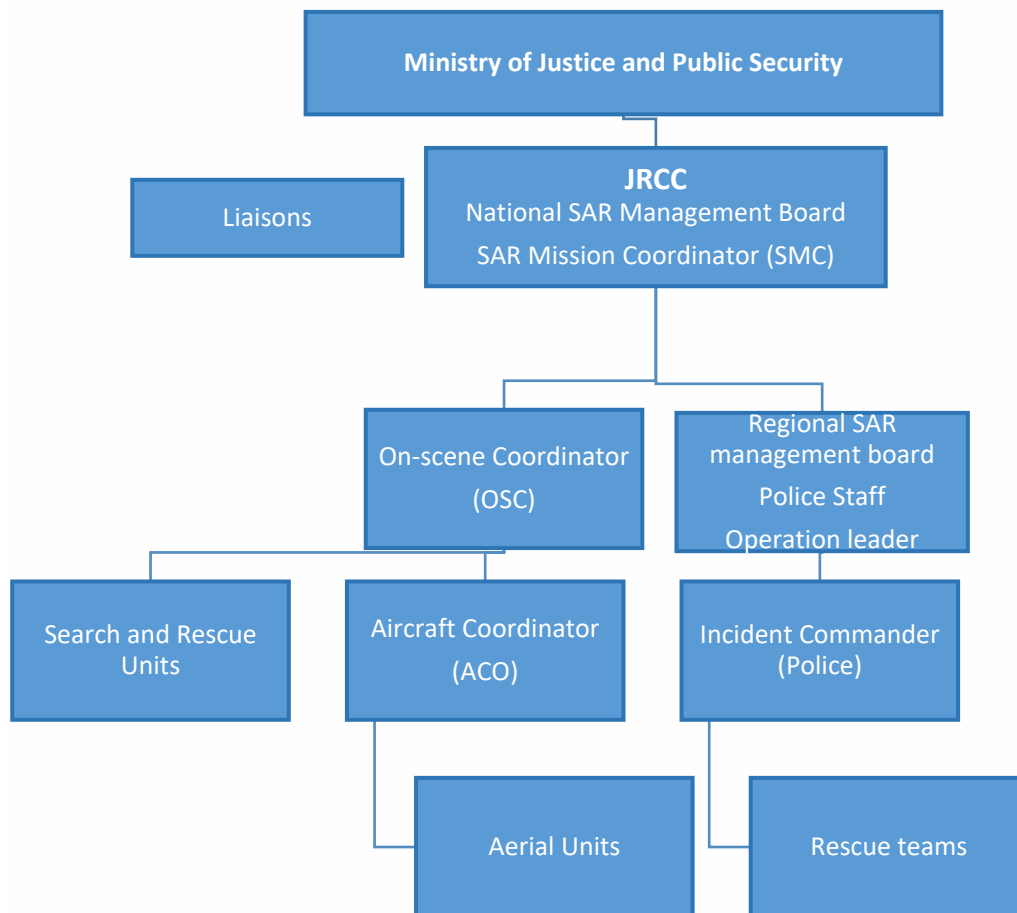
Each JRCC has a general manager that leads every-day operations and management of the JRCCs. The general manager acts under the authorization of the Chief of Police. Each centre has two SAR inspectors, 14 – 19 rescue controllers that operate as search and rescue mission coordinators and administrative personnel (Jamtli, 2017).

### 1.1.3 Organization and management at operational level

Norway's SAR command hierarchy follow the international guidelines and standards set in the International Aeronautical and Maritime SAR Manual (IAMSAR Manual). According to IAMSAR, the SAR system has three levels of coordination; the SAR coordinator (SC), the search and rescue mission coordinator (SMC), and the on-scene coordinator (OSC). The SAR coordinator (SC) has the overall responsibility for establishing, staffing, equipping and managing the SAR system including legal and funding support for the agencies. The SCs are not normally involved in the SAR operations. (IMO and ICAO, 2016a) The Chief of Police, and ultimately the Ministry of Justice and Public Security acts as the SAR coordinator in Norway. The operational level coordination is conducted by SMCs at the JRCC operational center under the authorization of the Chief of Police. The tactical level coordination during operations is delegated to an OSC, who is normally the person in charge of the first search and rescue unit to arrive at the incident site. (JRCC NN, 2017; Jamtli, 2017) The OSC is normally taken over by the coast guard if they arrive on-scene. Figure 5 illustrates the basic SAR command system in Norway.

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<sup>1</sup> På norsk: Lokal (kollektiv) redningsledelse



**FIGURE 5. SAR COMMAND SYSTEM IN NORWAY**

The SMC have the authority to take all necessary measures and assign all necessary resources to any life-threatening SAR incident. A minimum of two rescue controllers are on-call round the clock. The rescue controllers are recruited from various professions, such as the Navy, the Air Force, Air Traffic Service, the merchant marine (officers), coastal radio, civil aviation and the Police. All on-call personnel in the JRCCs are trained to coordinate maritime, aeronautical and land-based SAR incidents. Because the JRCCs are given the authority to utilize any resources available for maritime, aviation and land SAR, the SMC will collaborate closely with various authorities, agencies, organizations, operators and private companies. (Ministry of Justice and Public Security, 2003; Jamtli, 2017)

RSCs are subordinate to the JRCCs and while the RSCs coordinate land SAR incidents on local level, the JRCCs will have the overall responsibility on a national level. In practice, the JRCCs also will be closely involved in land-based incidents, especially when it comes to following plans, resources, logistics, search patterns, and so on. The JRCCs do not interfere with the RSCs work and coordination however assist if necessary, with resource allocation. (Ministry of Justice and Public Security, 2015; JRCC NN, 2017).



#### 1.1.4 Organization and management at the tactical level on-scene

At a sea incident site, a master of a distress vessel plays a major role in on-scene management having authority over the vessel. The SMC normally appoints an on-scene coordinator (OSC) who operates on a tactical level coordinating search and rescue units (SRU), aircrafts, and other assisting units or vessels arriving to the incident site. OSC works closely together with the distress vessel master and the crew. (IMO and ICAO, 2016) The OSC can be the person in charge of any vessel arriving to the scene first but normally in Norway, a Coast Guard vessel would be appointed as OSC. OSC can also be supported by a sub-coordinator if required. This can be relevant for example in multinational or large-scale actions. (Olsen, 2016). In a larger SAR operation, the role of the OSC/ACO will be very demanding. There will be the need for several persons helping out the OSC with creating search patterns, directing SRUs, radio communication and situational reports to the SMC (Borch et al., 2016).

An aircraft coordinator (ACO) can be appointed by the SMC to coordinate aerial units arriving to the incident site. The appointment of an aircraft coordinator is justified particularly in cases where several aircrafts are participating in a SAR operation. The Baltic ACO Manual (2010) suggests the ACO to be located either at the RCC or in an aerial unit. ACO in Norway would most likely be situated either at a Coast Guard vessel or onboard one of the Air Force aircrafts such as surveillance patrol planes or helicopters. In Norway, the JRCC SN has a desk with required equipment for an air traffic controller who can be called in from the air traffic control centre. (Olsen, 2016; Baltic ACO Manual, 2010) OSC and ACO work closely with each other to ensure most efficient coordination of the search and rescue units.

RSCs (run by the Police) and the local municipalities are responsible for providing logistics and on-shore coordination of emergency facilities including reception centres, food, clothes, next of kin communication, and transportation. The reception centre will take care of survivors, including registration, accommodation, and medical care. The police incident commander, appointed by the operational centre, is in charge of leading and coordinating actions at the incident site or reception site. The RSC can request from the company concerned to supply personnel to the reception centres for receiving and organizing follow-up arrangements for evacuated passengers and employees. The Police also carry out inspections depending on the incident. (Police directorate, 2011)

#### 1.1.5 The main providers of SAR resources and their coordination

External relations and liaisons are crucial for the JRCCs and RSCs since they would most likely call upon external resources for SAR incidents. In maritime incidents the JRCC or SMC will normally be in contact, for example with the following resources:

- coastal radio
- all vessels in vicinity of the unit in distress
- the rescue helicopter (330 squadron)
- the Norwegian Coast Guard
- the Armed Forces including the Joint Headquarters, the Air Force and the Navy



- the Norwegian Society for Sea Rescue (RS)
- the operating company
- Pre-hospital operational/call centres (EMCC)
- air ambulance and medical services
- the vessel traffic service
- port authorities
- other relevant stakeholders with possible resources and assets such as private operators (oil companies, cruise ship operators, fishing vessels etc.).

**The Norwegian Armed Forces'** contribution to search and rescue is substantial and the Armed Forces are responsible for a large part of the emergency resources in the High North. The Armed Forces are obliged to contribute in order to save human lives in a rescue operation. A special agreement between the Ministry of Justice and Public Security and the Ministry of Defence enables efficient deployment of military resources for civilian purposes such as SAR operations. The main departments involved in maritime and aeronautical SAR are the Navy with the Coast Guard and the Air Force.

The Norwegian Joint Headquarters (FOH) has the operational responsibility for coordinating military resources and operations in civilian operations (Norwegian Armed Forces, 2017). All requests for assistance of military resources go through the Joint Headquarters. JRCC would thereafter coordinate any resources allocated to that incident. The RSCs can request assistance directly from the Armed Forces but should notify the JRCC about utilized resources (JRCC NN, 2017).

**The Norwegian Coast Guard** plays a vital role in maritime SAR and have special obligations to participate in search and rescue operations according to the Coast Guard Law and the Directions of the Coast Guard. In addition, the Coast Guard patrols Norwegian waters, enforces Norwegian sovereignty, carries out fisheries inspections, transport police and special forces, gives medical support, emergency towing and participates in pollution preparedness. (Norwegian Armed Forces, 2016) The Coast Guard is often appointed to operate as the on-scene coordinator in off-shore or large-scale emergencies and has the capacity and competence to operate as an ACO (Olsen, 2016).

**The search and rescue helicopters of the 330 Squadron** are owned by the Ministry of Justice and Public Security and operated by the air force under the Ministry of Defence (Ministry of Justice and Public Security, 2015). The search and rescue helicopters operate from Banak, Bodø, Rygge, Sola, Ørland and Florø. The operational coordination of the SAR helicopters is dedicated to the JRCCs.

**The Norwegian Civil Defence** reinforcement capacities are also utilized in major incidents and accidents in Norway to scramble resources on land. Their assignments include efforts connected to fires, natural catastrophes, oil protection, searches, evacuation, material supply,

and other logistics. The Civil Defence normally operates under RSC coordination and command (JRCC NN, 2017).

**The municipal fire and rescue services** offer important resources for search and rescue in Norway. The municipalities are obliged to cooperate with other municipalities and emergency response organizations for the best utilization of regional resources. The primary duty of the local fire and rescue brigades is fire prevention and response on land and at sea. Their command system follows the national Incident Command System for emergency response. The fire brigades also provide rescue diving, MIRG (Maritime Incident Response Group) teams (in Norwegian: RITS Redningsinnsats til sjøs), and assistance to other rescue agencies in all types of incidents. The Directorate for Civil Protection (DSB) is responsible for organizing MIRG and chemical diving operations in Norway's SRR. DSB signs contracts with the municipal fire and rescue services for their tactical provision of the MIRG teams. Norway has seven MIRG teams on continual stand-by. (DSB, 2018) The JRCC will request the provision of MIRG teams. RSCs also cooperate closely with the fire and rescue services with regards to land SAR incidents. The organization and command system of the fire and rescue service will be further discussed in part 1.3 *Firefighting*.

**Emergency Medical Services (EMS)** consist of healthcare professionals and emergency medical help at several levels, including the medical emergency call service 113 (Norwegian Emergency Medical Communication Centre (EMCC), the municipality emergency room service (Legevakt, LV-centre) and ambulance services. The Norwegian Ministry of Health has set requirements for EMS in the *Regulation relating to requirements for emergency medical services outside hospitals (18 March 2005, No.252)*. The regulation specifies responsibilities in the various parts of the emergency medical chain, as well as coordination with JRCCs, police and the fire and rescue services (Norwegian Ministry of Health and Care Services, 2014).

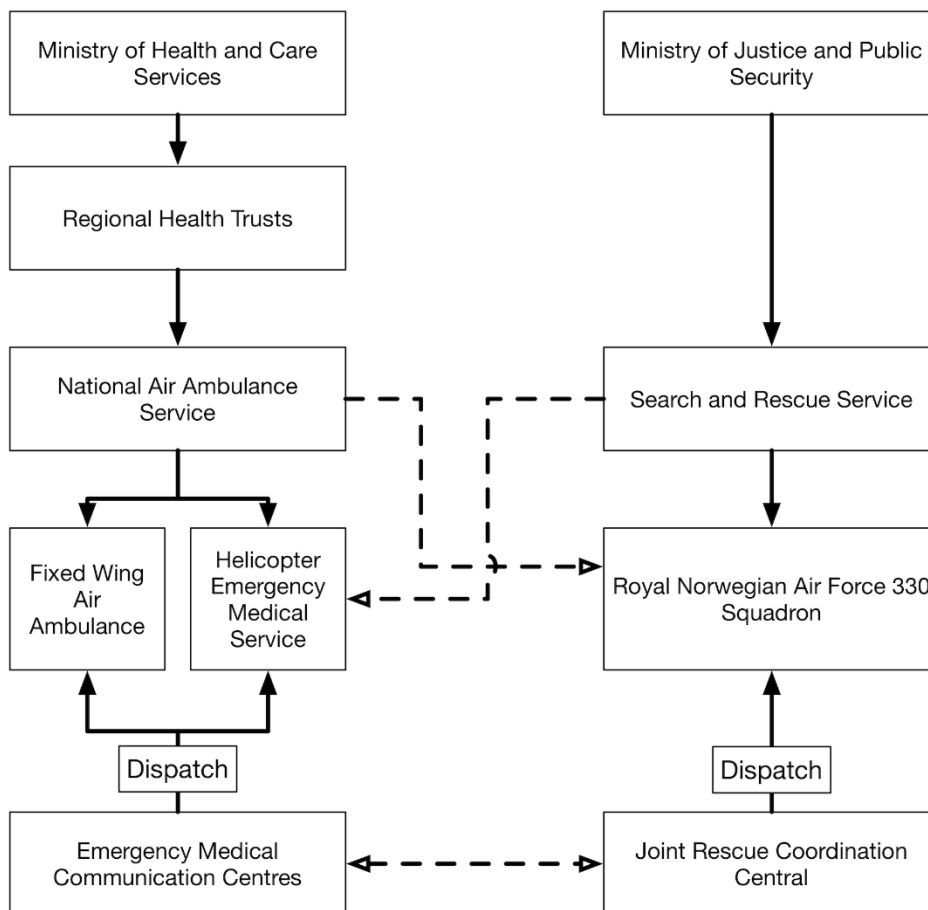
The municipalities are responsible for the primary preparedness related to medical and health services. The regional health authorities (RHF) are responsible for ensuring that specialized health services including hospitals, EMCC centres and the ambulance service (air, car and boat) are provided to the population in their area. The services are provided by the health trusts and private entities through agreements with regional health authorities. Emergency medical services in Norway also rely on voluntary organizations such as the Norwegian People's Aid and Red Cross (Norwegian Ministry of Health and Care Services, 2014).

The key liaison for the JRCC and RSCs is the Regional Medical Communication Center (R-EMCC) centres. The EMCC handle requests for emergency medical assistance, initiate and provide medical professional advice and follow up on emergency medical missions, including notifying and forwarding calls to other emergency services and JRCCs. The EMCC centres also manage and coordinate ambulance missions. They send out ambulances, paramedics, and doctors for SAR helicopters (Norwegian Ministry of Health and Care Services, 2005).

The National Air Ambulance Service is frequently utilized by the JRCCs and RSCs. The service contributes to major incident management with transportation of equipment, personnel and

patients, as well as providing aerial surveillance and performing search and rescue. The air ambulance service utilizes both fixed wing aircrafts and helicopter capacities. The Ministry of Health and Care Services has signed an agreement with the Ministry of Justice and Public Security that allows the National Air Ambulance Service to use SAR helicopters, coordinated by the JRCCs, for ambulance missions when they are available. Four of the SAR helicopters of the 330 Squadron are included in the air ambulance service. (Johnsen et al. 2017; National Air Ambulance Service, 2018). The JRCC or the RSCs may use the capacities of the National Air Ambulance Services in SAR operations both for acute medicine, transport of persons in need of treatment, and transport of medical personnel to the incident site.

### Organisational Structure



**FIGURE 6. NATIONAL AIR AMBULANCE SERVICE LINK TO THE NATIONAL SAR SCHEME (SOURCE: JOHNSEN ET AL. 2017)**

The air ambulance units are dispatched by the EMCC centre responsible for the region where the air ambulance services are located, while the SAR units are dispatched by one of the two JRCCs. The SAR helicopters are primarily used for SAR missions but can be released for air ambulance missions by the JRCC upon request from the EMCC centres. Similarly, air ambulance units can be released for SAR missions by EMCC centre on request from the JRCC.

Depending on the nature of the mission, EMCC centre or JRCC will have the main responsibility for coordinating the deployed resources. Coordination on-scene is in most cases handled by the SAR helicopters or air ambulance units themselves. Medical staff is present in both air ambulance units and SAR units. The air ambulance helicopters, however, have limited equipment and capacity for SAR missions, among others as they lack rescue hoist (Johnsen et al. 2017).

**Telenor coastal radio stations** in Stavanger (South) and Bodø (North) are connected to the JRCCs. The coastal radio stations monitor and receive distress signals of the GMDSS system, broadcast maritime safety information and provide communications for emergencies at sea. The coastal radios will relay messages and report distress signals to the JRCCs and serve as communication links during a SAR operation. The Ministry of Justice and Public Security is responsible for the coastal radios and has delegated the service to Telenor Maritime Radio (Kystradio, 2018).

Another monitoring service to improve safety at sea is **the Vessel Traffic Service (VTS)** operated by the Norwegian Coastal Administration. VTS prevents incidents by monitoring and regulating ship traffic in defined areas along the Norwegian coast. It may discover potential incidents, and in maritime emergencies VTS can also assist the SAR operation by re-routing and contacting other vessels, including the towing vessels of the Coastal Administration, and keeping the incident site clear for the search and rescue units (Norwegian Coastal Administration, 2018).

**Avinor's Air Traffic Control** monitors the air traffic and reports distress signals from aircrafts. The ATC is in charge of controlling and coordinating flights within the Norwegian flight information region, including the arrival of international aerial units taking part in SAR operations, and providing other air traffic services in Norwegian airspace. Avinor is a subordinate enterprise to the Ministry of Transport and Communications. (Avinor, 2018). It also runs most of the airports that includes significant emergency response equipment and personnel.

**The Norwegian Society for Sea Rescue (Redningselskapet, RS)** provides key assets for coastal maritime SAR in Norway on tactical level. RS is a voluntary organization with professional seamen and volunteers manning their rescue vessels that operate along the coastal Norway and in some cases offshore even up to Bear Island (RS, 2018). RS has in total 51 vessels. The JRCCs would normally contact the RS rescue vessels directly through maritime radio VHF if their assistance is needed (JRCC NN, 2017). RS also has an operations centre in Oslo that monitors the coastal areas and provide help for operations.

**The Norwegian Red Cross** has a key role in the land SAR system and local disaster preparedness. They operate on various fields, mostly within land SAR, but also have operations for sea and lakes. (Red Cross, 2016) Their volunteers are trained with professional search tactics and first response and are thus a major contributor to national SAR capacity. Svalbard, in particular, relies on Red Cross's SAR capabilities. The Red Cross in Norway usually

operate under the RSC command. Red Cross has a local point of contact in each region. The RSCs or JRCCs often contact FORF voluntary organisations if they want to alarm voluntary personnel for SAR operations. FORF will then delegate resources from the voluntary organizations (JRCC NN, 2017).

**Oil and gas companies, Norwegian Coastal Administration and the Norwegian Clean Seas Organization (NOFO)** also have a liaison role in the Norwegian SAR system with significant capacities useful in SAR operations. According to the Norwegian Petroleum Act (No.72, 1996), oil companies are responsible for preparedness related to the oil and gas fields they operate. They should maintain an effective emergency preparedness including their own SAR resources such as helicopters, stand-by vessels, emergency response and rescue vessels and other service vessels such as platform supply vessels with preparedness functions. The JRCC alarms and cooperates closely with the oil companies, NCA, NOFO and the inter-municipal groups if the incidents require coordination between them. Oil spill response management follows the national Incident Command System which will be further discussed in part 1.2 in this chapter.

**International cooperation.** Norway and its neighbouring countries have organised their SAR systems in accordance with international regulations and the requirements of the International Convention on Maritime Search and Rescue. Norway has bilateral agreements with the neighbouring countries, of which most are based on the SAR Convention. This convention ensures sufficient SAR resource allocation and coordination with another rescue coordination centre (RCC). (Jamtli, 2017) The bilateral agreements are intended to facilitate exchange of information and cooperation in SAR situations and ensure that the nations can request their neighbouring country to provide assistance in incidents. The JRCC and the responsible SMC would maintain the leading responsibility and coordination of the incident within its search and rescue region (SRR). Most countries have national procedures for utilizing foreign units in SAR operations. (JRCC NN, 2017) Norway usually requests a clearance for foreign rescue units with a simple procedure, and good contact with the police and customs. The Norwegian Civil Defense that may help with facilitating the transport and housing of foreign support<sup>2</sup>.

The Barents Euro-Arctic Region has developed a Barents Joint Manual based on the Agreement between the Governments in the Barents Euro-Arctic Region on Cooperation within the field of Emergency Prevention, Preparedness and Response as an operational tool providing guidance for international cooperation (Barents Euro-Arctic Council, 2017). The coordination of international aerial units entering national Flight Information Regions is handled by the Air Traffic Control (JRCC NN, 2017). In large-scale incidents, the JRCC may also ask for additional resources from other countries through the Host Nation Support Scheme (HNS) developed through international organizations including the Red Cross, the UN's Office for the Coordination of Humanitarian Affairs (OCHA) and the European Union (EU).

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<sup>2</sup> DSB Guidelines for host nation support in Norway (in Norwegian).

### 1.1.6 Operational hierarchy and management responsibilities in mass rescue operations (MRO)

The structuring of the SAR system in Norway is rather complex with different layers according to the agency involved.

The Norwegian SAR system is organized with a National and a Regional structure. The JRCCs are at national level, while the RSC run by the police is at regional level. The police divide its organization first in a national strategic, operational and tactical level, and then in a regional strategic, operational and tactical level. The national tactical level is the same as regional strategic level. The regional strategic level is run by the Chief of police in each police district.

#### **Strategic level**

**Government authority.** The Ministry of Justice and Public Security is responsible for SAR management at the national strategic level. The ministry focuses on the national ability to handle emergencies and builds national plans and strategies for crisis and emergency situations. The ministry is also responsible for strengthening crisis management capabilities and coordination of civil protection and emergency preparedness. (Ministry of Justice and Public Security, 2015)

A National SAR Management Board is linked to each of the JRCCs and is responsible for preparedness plans and national cooperation together with all relevant agencies and organizations that are represented in the management board. The National SAR Management Boards are not summoned during normal operations. However, if a major crisis or emergency occurs, the board will coordinate the national strategic level response. In some cases, only some of the members of the management board can be called in to the JRCC. In an MRO, there will be many responding organizations that will need to communicate with each other from the beginning of the incident.

The board helps and advises the SMC in situations where the SAR services are lacking resources, competence or authority. This could for instance be expert medical advice, transport, communications advice or other. The SMC will give the board update brief when necessary or when the board asks for it. If the board does not agree with decisions taken by the SMC, they can bring it up to the head of the SAR management board, who will, if needed, tell the SMC to change the decision. The management board will normally plan ahead and work with the organizations they represent to provide the resources and decisions needed to solve the SAR case in the most efficient way possible. The board can also evaluate if the incident requires coordination from other authorities than the JRCC, for example, from the police if there is an incident with a terror threat.

The general managers of JRCCs also work with strategic level management when it comes to JRCC and SAR strategies, plans, and preparedness with the Chief of Police, National SAR Management Board, ministries, other authorities and the international fora.

**Owner company authority.** The ship owner/operating company is responsible for preparing emergency response plans (contingency plans) for the vessel and, if applicable, a SAR cooperation plan together with the SAR services. The SAR cooperation plans should indicate the measures of cooperation between the ship owner and the SAR services. The ship owner may send a liaison officer to the JRCCs in a major incident, if required. In situations where the emergency on board the vessel develops relatively slowly or is at its early stages, the ship owner or the company will generally lead the response. The company response team should have a close dialogue with relevant authorities about the emergency situation, including the JRCC, so that they can start preparations in case the situation evolves.

The operating company/the ship owner can request some assistance, but the overall coordination is handled by the ship owner while the situation is under control. If an emergency evolves to the point where the ship owner and the ship crew cannot handle it, the coordination will be passed to the JRCC and the relevant response authorities on-shore. The ship owner or the company can support on a strategic or operational level. They should offer their assistance in providing health care support, personnel, media and next of kin communication, reception and follow-up arrangements for evacuated passengers and employees. The company can be helpful in providing transportation and accommodation, money, clothing and other necessities. The company will communicate with the RSC and JRCC in order to be informed on the condition and location of the passengers and personnel, and the established reception point (Jardin-Smith, 2016; JRCC SN and NN, 2017). The ship company is also responsible for salvage operations and communication with insurance companies.

Communication to the media and next of kin are also major tasks during large-scale incidents. It is important to dedicate roles for media and next of kin coordinators. Media inquiries and responses can be quite overwhelming, and the next of kin inquiries can block the normal communication lines in major incidents. Media communication would normally be done according to the shipping company's policy. However, the JRCCs are responsible for providing information on the SAR operation. If the media is in contact with a ship involved in a SAR operation, the ship must ensure that the SAR operation is not distracted by traffic from the media. All participating facilities must base their information activities on providing information about themselves and the tasks they are responsible for, and avoid reporting on matters beyond their knowledge or competence. Social media has a huge role in emergencies. Provided there is cellphone coverage, the ship owner and JRCC can expect that the passengers are using their mobile telephones to notify media of events onboard the vessel or in the area. Therefore, it is important to keep the ship's own crew and passengers informed of the situation, both when the ship itself needs assistance and when assisting others (JRCC SN and NN, 2017).

The police will normally notify next of kin in the event of death by accidents or criminal act. Uninjured persons can inform their next of kin themselves with assistance of the ship company, the police or the medical personnel. Hospitals are responsible for notifications to the next of kin if persons are hospitalized. Hospitals can also request assistance from the ship

company or the police. The police shall be informed when and by whom the next of kin were notified (JRCC, SN and NN, 2017).

**Other authorities.** Depending on the scale and type of an incident, the strategic level in major maritime emergencies would most likely include also insurance and salvage companies, port authorities, local county or community representatives, other national government committees including the emergency council, Norwegian Maritime Authority, coastal administration and other relevant agencies, representatives from consulates and embassies of flag states, and passenger and crews' home countries (Borch et al. 2016).

**Operational level**

The operational hierarchy and responsibilities within SAR are based on the IAMSAR Manual. The basic structure of the operational hierarchy was illustrated in figure 5. Figure 7 shows the SAR hierarchy during large-scale maritime incidents in Norway.

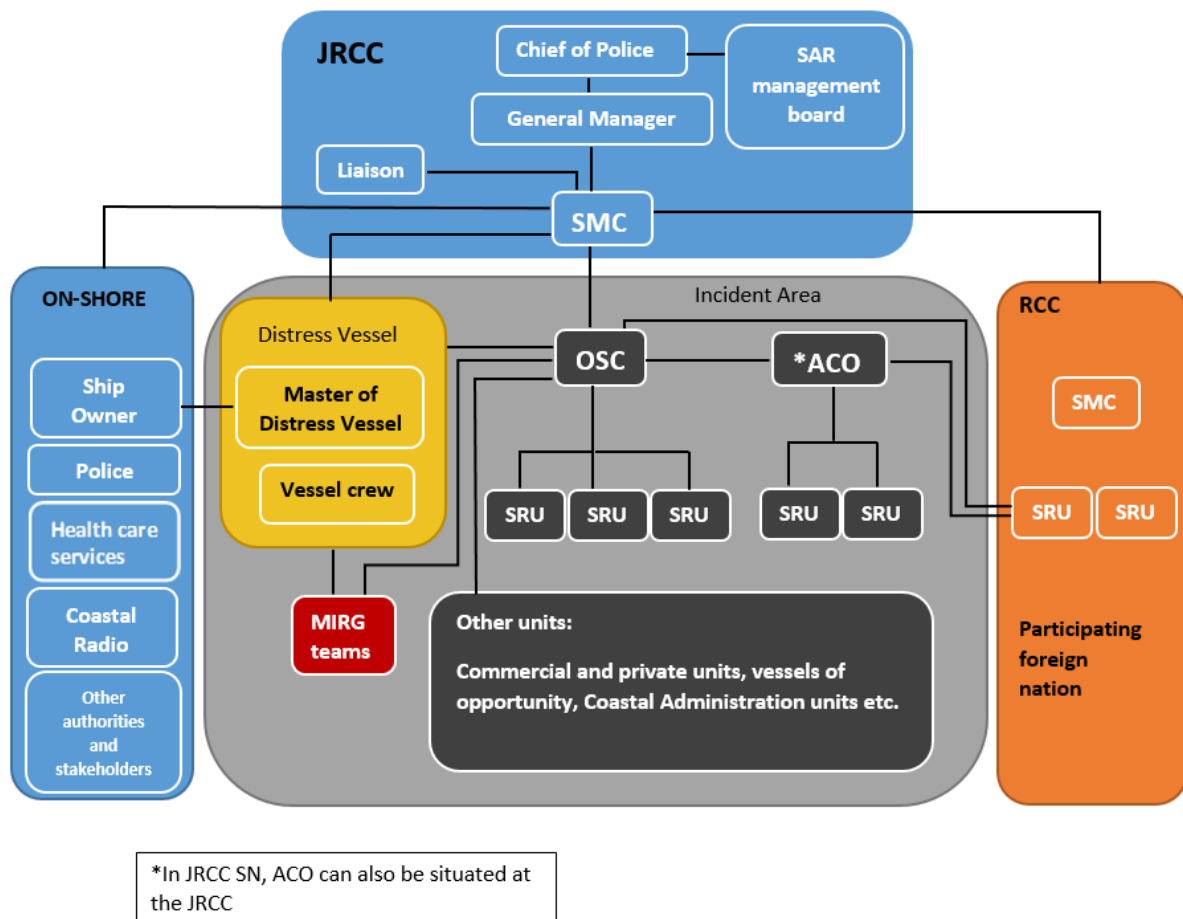


FIGURE 7. THE SAR HIERARCHY DURING LARGE-SCALE MARITIME INCIDENTS IN NORWAY

At the operational level, **the search and rescue mission coordinator (SMC)** will be in charge of the overall coordination of incidents and allocation of all necessary resource. In Norway, the rescue controllers at JRCC NN also fill the role of Mission Control Centre (MCC) operators



receiving and handling COSPAS SARSAT distress signals (Jamtli, 2017). JRCC NN is responsible for distributing alerts to the Norwegian JRCCs. The SAR Mission Coordinators (SMC) work at the JRCC as rescue controllers. Operations are normally carried out under the direction and supervision of the SMC. The SMC will have a support team around him/her comprising of the rest of the watch team. The watch team supports the SMC during the coordination process with, for example communications, plotting, logging and search planning. The SMC will gather information about the distress situation, develop action plans and dispatch and coordinate resources to the incident site. SMC will appoint an on-scene coordinator and an aircraft coordinator, if necessary. The SMC also notifies other government authorities of the operations where necessary and liaise with the RCCs, and other nations contact points if international SRUs are required (IMO and ICAO, 2016b).

According to IAMSAR Manual Vol 2. (IMO and ICAO, 2016b), guidelines for SMC responsibilities and management in an operation include the following:

1. *Obtain and evaluate all data on the emergency;*
2. *Ascertain the type of emergency equipment carried by the missing or distressed craft;*
3. *Remain informed of prevailing environmental conditions;*
4. *If necessary, ascertain movements and location of vessels and alert shipping in likely search areas for rescue, lookout and/or radio watch on appropriate frequencies to facilitate communications with SAR facilities;*
5. *Plot the area to be searched and decide on the methods and facilities to be used;*
6. *Develop the search action plan (and rescue action plan as appropriate), i.e., allocate search areas,*
7. *Designate the on-scene coordinator (OSC), dispatch SAR facilities and designate on-scene communications frequencies;*
8. *Inform the chief of police as head of the JRCC on the search action plan;*
9. *Co-ordinate the operation with adjacent rescue coordination centres (RCC)s when appropriate;*
10. *Arrange briefing and debriefing of SAR personnel;*
11. *Evaluate all reports from any source and modify the search action plan as necessary;*
12. *Arrange for the fuelling of aircraft and, for prolonged search, make arrangements for the accommodation of SAR personnel;*
13. *Arrange for delivery of supplies to sustain survivors;*
14. *Maintain in chronological order an accurate and up-to-date record with a plot, where necessary, of all proceedings;*
15. *Issue progress reports;*
16. *Recommend to the RCC chief the abandoning or suspending of the search;*
17. *Release SAR facilities when assistance is no longer required;*
18. *Notify accident investigation authorities;*
19. *If applicable, notify the State of registry of the aircraft in accordance with established arrangements; and*
20. *Prepare a final report on the results of the operation*

The SMC also maintains connection with operational and tactical levels on shore and if necessary, ask a liaison or advisor to come to the JRCC. The SMC will inform the chief of police when necessary. With aeronautical incidents, the SMC works closely with Air Traffic Control as well as the Armed Forces' Joint Headquarters' air operations unit to locate missing aircrafts. After an aircraft is located, the incident will be led and coordinated as either a maritime or a land SAR operation. For the SMC, it is important to make clear to all participating units and responders of who is leading and responsible for the operation and who they will receive instructions from. The SMC will be in charge of a SAR operation until the rescue mission is completed or further efforts would be of no avail, or if coordination is transferred to another RCC or RSC (IMO and ICAO, 2016b; JRCC NN, 2017).

**The Rescue Sub-Centre (RSC)<sup>3</sup> run by the police and the municipalities** are in charge of the on-shore management of receiving passengers and establishing reception centres. The RSCs will coordinate care of survivors including registration, accommodation, medical care, and transportation. (JRCC SN and NN, 2017) In large-scale mass evacuation operations, the SMC will have to coordinate and communicate closely with the operations leader of the rescue-sub centres or the shore side incident commander for the transfer of crew and passengers to on-shore facilities and care.

While formulating the rescue plan, SMC should also consider establishing a forward medical base to enable triage by competent medical staff. It is important to do so in order to ensure an efficient transfer from sea to land and finally to medical care. From a maritime SAR perspective, the establishment of the reception point to a nearest accessible landing site will usually be the most efficient in order to save time during evacuation and rescue however the nearest landing site can be far away from hospitals or reception centres with limited infrastructure and shelter (Jardine-Smith, 2015; Finnish Border Guard, 2014).

The police Operations leader has to evaluate where to establish reception points and on-shore emergency rescue facilities in order to keep the evacuated safe and sheltered, but due to distances, conditions and other dangers in the Arctic, this is a very complex task (Jamtli, 2017). It is also important to consider what resources and medical or volunteer staff can be transported to the reception point. As per request from the RSC, the company concerned shall supply personnel to reception centers and to the police for assistance to organize the reception and the follow-up arrangements for evacuated passengers and employees. The police are also responsible for notifying next of kin in the event of death by accidents or criminal act (JRCC SN and NN, 2017).

**The EMCC (Emergency Medical Communication Center)** will serve as an operational point of contact for medical services and paramedics. The EMCC handles all requests for emergency medical assistance, provide medical professional advice and follow up on emergency medical missions, including notifying and forwarding calls to other emergency services and JRCCs. The EMCC also manages and coordinate ambulance missions, send and coordinate paramedics and ambulances to the incident, and doctors to SAR helicopters. (Norwegian Ministry of Health and Care Services, 2005; 2014) A doctor sent to a SAR helicopter, competent rescue

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<sup>3</sup> In Norwegian: Lokal redningsentral (LRS)

men of the SAR helicopters, or another paramedic, will assume the operative role of an incident commander for medical coordination or coordination of first response at the incident site or during transport. Primary triage can be started by the SAR-helicopter doctor and paramedics arriving to the scene, or by the vessel's own crew.

In case of fire on board a vessel, firefighting assistance and smoke divers can be requested from the **local fire brigades** through the JRCCs (Saltén Brann, 2011). The fire brigades in Oslo, Larvik, Bergen, Stavanger, Ålesund, Bodø and Tromsø have Maritime Incident Response Group (MIRG or RITS in Norwegian) teams that have special competence and equipment for fire-fighting onboard ships (DSB, 2018). The MIRG teams in Norway consist of a MIRG operations team leader, a smoke diving leader and smoke divers. Their primary task is to save human lives, and their secondary task is to assist with firefighting. SMC usually alerts MIRG teams to SAR operations, if they are needed, decides when and how to use them, and arranges the transportation to the team with either aerial or surface units. The fire chief from the municipal fire department should be notified of any MIRG operation and he/she makes the final decision whether to send out a MIRG team to an incident. The MIRG team will operate under the command of the captain since the captain has the main responsibility for emergency operations aboard his/her ship. The MIRG operations leader will lead the MIRG operation including operational and tactical efforts. He will make decisions in consultation with the vessel's captain. JRCC will maintain the overall coordination responsibility of the incident.

Usually **the ship owner** or a company that operates large vessels also has its own crisis response team to handle different tasks that the company is responsible for during incidents. The staff may include:

1. *A crisis team manager who maintains an overview of the situation, directs operations and keeps the company management informed,*
2. *A communication coordinator to maintain or open the lines of communication to the vessel in distress, coordinating representative (usually a pilot or master mariner) who coordinates efforts with SAR and other emergency authorities, and organizes other facilities,*
3. *A technical representative who keeps contact with regulatory authorities, insurance companies, provides advice for firefighting, damage control and other technical matters,*
4. *A medical representative to give medical advice,*
5. *A passenger and crew representative to provide information and support for the next of kin coordinator keeping them informed and providing help with languages and cultures,*
6. *Media representative who will coordinate public affairs and,*
7. *Secretary to log the incident data. (IAMSAR Vol. 2, p. C-3, C-4)*

The company crisis response organization should be able to assist the SAR services by organizing support, equipment, advice and liaison with any of their vessels and provide relevant information for the SAR services. They will also provide the salvage resources for the

vessel to be brought to shore. The coast guard, towing vessels of the coastal administration and the Norwegian society for sea rescue (RS) often help with towing tasks.

### **Tactical level**

**The on-scene coordinator (OSC).** When two or more units are working together on-scene during a SAR mission, the SMC usually appoints an on-scene coordinator to coordinate activities of all participant units and carry out a search action plan provided by the SMC. The OSC is responsible to the SMC and reports to the RCC during an incident. The OSC is usually the person who is in charge of the first SAR unit arriving on-scene until the SMC relieves the OSC from his/her duties. This can be either a professional SAR unit, for example a vessel, aircraft or land-based team from the coast guard, coastal administration, armed forces, fire and rescue services, police, RS, Red Cross, or a private unit such as a vessel, aircraft or other facility that is the closest to the incident with a capability to handle OSC duties. The OSC should be the most capable person available to fulfil the responsibilities. (IMO and ICAO, 2016b). In Norway, the crew of the coast guard vessels have special training in serving as OSC and the manning needed to fulfil this role.

The OSC is, first and foremost, responsible for carrying out the search action plan and coordinating, monitoring and providing information to all SAR facilities on-scene. In addition, the OSC needs to modify the action plan received from the SMC based on the prevailing conditions, ensure that the operations are conducted safely, maintain a detailed record of the incident, keep track of the number and names of the rescued people, provide situation reports to the JRCC, liaise and act as support for the vessel master (in maritime incidents), and advice RCC on which SAR units are required. If a search plan has not been provided by the SMC, the OSC should do the planning until an SMC assumes the search planning function. (IMO and ICAO, 2016) The relation between an OSC and SMC is always a joint-effort and a mutual discussion on how much responsibility can the OSC handle and how to best coordinate the incident based on OSC observations. In simple terms; SMC will tell what to do and OSC will tell how to do it (Finnish Border Guard, 2018).

If the OSC becomes aware of a distress situation directly and communications cannot be established with an RCC, the OSC may also have to assume some of the SMC duties and actually plan the search and/or rescue (IMO and ICAO, 2016). This is highly relevant to keep in mind in the Arctic where communication with shore side is not always sufficient due to lack of communications infrastructure and extreme conditions in the Arctic. The poorer the communication is with the SMC, the more authority and responsibility the OSC has to take during the incident. Depending on the situation, the IAMSAR manual Vol. 2 states that the OSC responsibilities and duties in an operation normally includes the following steps:

- 1. Assume operational co-ordination of all SAR facilities on-scene;*
- 2. Receive the search action plan from the SMC;*
- 3. Modify the search action plan based on prevailing environmental conditions and keeping the SMC advised of any changes to the plan (do in consultation with the SMC when practicable);*

4. *Provide relevant information to the other SAR facilities;*
5. *Implement the search action plan*
6. *Monitor the performance of other units participating in the search;*
7. *Co-ordinate safety of flight issues for SAR aircraft; (this can also be done by ACO)*
8. *Develop and implement the rescue plan (when needed);*
9. *Make consolidated reports (SITREPs) back to the SMC. SITREPs should include but not be limited to:*
  - *weather and sea conditions*
  - *the results of search to date*
  - *any actions taken*
  - *any future plans or recommendations.*
10. *Maintain a detailed record of the operation;*
11. *Advise the SMC to release facilities no longer required;*
12. *Report the number and names of survivors to the SMC;*
13. *Report which survivors are in each facility. (IAMSAR Vol. 2, 2016, p. 1-3, Vol. 3, 2016, p.3-3, and Appendix I)*

The on-scene coordinator role is very challenging and often requires a whole team around the person who is assigned as an OSC. In large-scale maritime operations, OSC is an essential communication link between the JRCC, the distress vessel and the units arriving to the incident site. While the OSC has to be on top of communications and providing information to the SMC, to the master of the vessel, to search and rescue units and also to masters of any Samaritan vessels, the OSC also has to execute the search plan, guide and provide instructions to any unit taking part of search and rescue, keep track of the number and location of people and keep an overview of the whole incident. The OSC can easily be overloaded by taking the responsibility of all the mentioned tasks and thus require a competent team around him, so that some of the tasks can be delegated to them or they can otherwise help the OSC with his/her duties. It is also important to note that the role of the OSC is to coordinate but not take command of the distress vessel or any units arriving on-scene. The safety and responsibility of the vessel and any passengers will remain with the master of the distress vessel or other distress facility and the safety of each responding unit is the responsibility of that unit's own commander (Jardine-Smith, 2016b; Borch et al. 2016; Finnish Border Guard, 2018).

**The aircraft coordinator (ACO).** The SMC can appoint an aircraft coordinator to coordinate all airborne resources arriving to the incident site if the incident requires involvement of two or more aircrafts. Normally ACO is responsible to the SMC. The primary function of ACO is to maintain high flight safety and avoid aircraft collision. This includes flow planning, prioritizing and allocating tasks, coordinating the coverage of search areas, forward messages, and make aeronautical units aware of each other, coordinating aircraft refueling. He has to work closely with the OSC and the SMC. The ACO instructions must never be understood as air traffic control clearances but should be regarded as advisory information. However, the search and rescue units should follow ACO's instructions as closely as possible. It should be noted, that

the ACO will not take over the responsibility of flight safety from the pilot in command of the SRU. (Baltic ACO Manual, 2010) Based on the IAMSAR Manual Vol. 2 (2016) and the Baltic ACO Manual (2010), the ACO duties and responsibilities can be the following, depending on needs and qualifications:

*1. Maintain flight safety:*

- *Ensure no conflict between aircrafts (avoidance of midair collisions).*
- *Ensure common pressure setting is used*
- *Advice the SMC of on scene weather implications.*
- *Determine aircraft entry and exit points and altitudes.*
- *Coordinate with adjacent Area Control Centres (ACC) and airfields.*

*2. Prioritize and allocate tasks to aircraft:*

- *Ensure air facilities are aware of the SMC/OSC overall plan.*
- *Identify emerging tasks and, in coordination with the SMC, direct SAR aircraft to meet them.*

*3. Coordinate the coverage of search areas:*

- *Respond to changing factors on-scene and supervise effectiveness of searches.*
- *Monitor and report search area coverage.*
- *Advice SMC/OSC on how to maintain a continuous coverage during search.*

*4. Coordinate aircraft refueling.*

*5. Forward radio messages.*

*6. Make periodic SITREPs to the SMC and OSC.*

*7. Coordinate with the OSC:*

- *Assist in execution of the SMC directives.*
- *Maintain communications.*
- *Advice on how the ACO can assist. (Baltic ACO Manual, 2010, p 7-8)*

ACO is normally located at the most suitable facility with necessary communications equipment and trained personnel in ACO procedures, such as a fixed wing aircraft, helicopter, coast guard vessel or on-shore from Air Traffic Control or JRCC (Baltic ACO Manual, 2010). Only JRCC Stavanger has the capacity and equipment to accommodate an ACO at the JRCC. In Northern Norway and Svalbard, it is more efficient to perform the ACO function from a unit on-scene due long distances and limited communication capacity. This enables continuous communication and efficient coordination with the OSC as well. If the SMC cannot be contacted and the incident does not have an OSC, the ACO can take on the overall coordination responsibility.

**The master of the vessel.** In maritime incidents with a passenger vessel, it is important to distinguish the responsibilities and authority of the SAR agencies and the master of the distress vessel (Finnish Border Guard, 2014). The distress vessel management includes the master of the vessel and his officers comprising usually of chief officer, chief engineer, the bridge team and the safety crew with special training. Each will have dedicated tasks on the muster list and competences to handle various emergency situations. The master of the distress vessel is responsible for the vessel's and passengers' safety for all types of acute emergency and preparedness incidents, in which the vessel is involved. Rescue measures on board a vessel in distress are coordinated by the master, including giving information and orders to external groups such as the paramedics, the MIRG teams, chemical divers, etc. The master also needs to assess the conditions of the vessel and the incident site in order to make the best decisions for passengers' safety.

The master is responsible for establishing communications with the JRCC, and has to provide continuous situational awareness so the SAR coordinators can make decisions and alarm the relevant resources for the SAR operation. The master has the key role in handling the situation on board the vessel including evaluating the situation, alarming, launching mitigating measures, making sure the crew is in their dedicated stations, communicating the situation to the crew, passengers, the ship owner, JRCC and OSC, and make the difficult decision on evacuation.

If the master decides to evacuate, he must also direct the crew to prepare the vessel and lead the evacuation. Even if the professional rescue personnel on board the vessel assist with the evacuation, the master will stay in charge. Once the passengers are off the vessel, the authority will transfer to the SAR agency or search and rescue unit's captain (Finnish Border Guard, 2014).

**Good Samaritan vessels or vessels of opportunity** are other vessels and ships that are close to the area of the incident and are used as a search and rescue resource in maritime SAR operations. SOLAS Chapter 5, regulation 33 (2002) states that:

*“The master of a ship at sea which is in a position to be able to provide assistance on receiving information from any source that persons are in distress at sea, is bound to proceed with all speed to their assistance, if possible informing them or the search and rescue service that the ship is doing so”.*

The Good Samaritan vessels are often the first ones to arrive on-scene and are critical in saving lives, especially in remote regions with limited SAR facilities such as the Arctic. In some cases, the Good Samaritan vessel can also take the role of the on-scene coordinator if the vessel is the first to arrive on-scene. These vessels may also be the best possible location to evacuate the crew and passengers from a vessel in distress. For example, cruise ships often have capacity and competence to host injured patients and passengers and have extra equipment and tools on-board. Vessels that regularly sail in the Arctic also have local knowledge and experience of the prevailing conditions and can operate in areas that might not be known to the rescue management and personnel. The key roles of the Good Samaritan vessels comprise of their captains, officers and the rest of their crew. They shall assist as requested and treat

the persons in distress within the best of the vessel's and crew's capability. The captain will be in charge of the operations on board his/her vessel and is responsible for the safety of the passengers and crew after boarding the Good Samaritan vessel (USCG, 2006).

**The MIRG fire brigade operation commander/team leader.** When it comes to MIRG operations at sea, the tactical responsibility is either with the vessel master or the MIRG operation team leader or operation commander. The MIRG team will operate under the command of the vessel's captain, however the MIRG operation commander has the responsibility of leading the MIRG operation and the team. All decisions are made in consultation with the vessel's captain. Because the operation is usually a maritime SAR incident, the MIRG team and the team leader will act under the SAR authority and follow instructions from the on-scene coordinator or the SMC. The primary responsibility of the MIRG teams is to search, rescue and evacuation of passengers and crew who may have been trapped by fire, smoke and fire gases. Firefighting comes secondary to saving lives. An on-scene coordinator, if appointed, will maintain the responsibility of coordinating any SRUs and assets arriving to the scene and keeping track of the SAR efforts. Coordination between the leadership on the bridge, the OSC, and the JRCC is necessary for the effective overall operational coordination of combined SAR operations (Finnish Border Guard, 2016).

**The police incident commander.** During land SAR incidents, major criminal incidents at sea, and incidents involving shore side reception points, the rescue sub-centre is in charge of the operative coordination and management of operations. The police on-scene incident commander, appointed by the operational centre, is in charge of leading and coordinating actions at the incident site or reception site. The police incident commander's primary role is to facilitate the SAR units and teams, and coordinate resources and support functions. With search and rescue on land, the police incident commander has a major role in organizing and planning search actions and efforts, keep contact with the local RSC providing situational reports, and coordinate intelligence and other measures taken by the police. The incident commander is also responsible for the safety of the SAR personnel and crew and also for handling media relations (Redningstjenesten, 2015).

In major incidents, the police command on land will also be supported by incident commanders from health and fire brigade. The three incident commanders will form a command centre or unified command (In Norwegian: Innsatsleders kommandoplass - ILKO), where each will lead operation within one's area of responsibility. **The incident commander from the fire services** is responsible for any firefighting task and the technical aspect of a rescue operation.

**The incident commander health** is responsible for the operation of the medical teams and resources including assessing personal and ambulance capacities, safety of the health personnel and services, organizing health services at the incident site and reception site, and establishing evacuation chains to the hospital and emergency rooms. (Police Directorate, 2011) The incident commander health is the primary contact point to the EMCC centre on tactical level and he/she reports any needs for personnel, ambulances, helicopters and



equipment to the local EMCC centre. All incident commanders report and work together with the police incident commander in the on-scene command center (ILKO) and aim to maintain an up to date overview of the situation through their respective duties (Norwegian Directorate of Health, 2016).

Large-scale incidents often require assistance from other nations, in which case on tactical level the OSC and ACO will coordinate foreign SRUs and other assets arriving on scene as well. Utilizing foreign units can be challenging as sometimes communication from RCC to RCC, RCC to OSC and OSC to SRU might differ or not be in line with each other, for example if information or situational reports do not reach the participating countries and units fast enough or situational awareness is flawed. Most countries have adopted standard operating procedures and plans that are meant to assist with managerial responsibilities and coordination of joint SAR incidents.

#### 1.1.7 Plans and standard operating procedures presenting the main action patterns

The plans and operational procedures for SAR in the JRCCs in Norway are based on the standard structure of operations defined in the IAMSAR Manual. The Rescue Handbook (2018) provides a general description of the Norwegian SAR system and provides an overview of the roles, responsibilities and plans for the Norwegian SAR services. The JRCCs have developed structured plans for all types of incidents and SAR operations divided into maritime, aeronautical and land SAR incidents. All of these plans are further divided into specific and detailed descriptions separating various types and scales of incidents. Depending on the type and scale of the incident, their log system in the JRCC automatically retrieves the operational plan linked to that particular incident that the SMC selects from the system. The log system is used to log and report all decisions made, all SAR resources deployed and keep track of the operations. The JRCC can also see all decision made by the RSCs in the log system. (JRCC NN, 2017). The SARA decision support system is an important tool for operational management. The system aggregate and present all relevant information about an emergency incidents, including location-based information on electronic maps, resource bases, check lists, and logging of messages.

The plans of operations include all relevant information that the IAMSAR manual (Vol 2, p. 1-6) requires, including procedures for SAR coordination, types of SAR operations, responsibilities of coordination, facilities, communications and liaison, and other operational information. All these functions are adjusted according to the national system and conditions. The plans include information on communication to relevant national authorities and the use of relevant resources. The JRCCs have recently updated most of their operating plans. The new plans are more comparable and has the same standard structure when it comes to maritime, aeronautical and land SAR. The plans also consider geography as well as resources specific to the search and rescue region. The new MRO plans will also be more adjusted to the current situation and activity in the Arctic (JRCC NN, 2017).

RCCs usually have checklists in their plans of operations based on the recommended checklists in the IAMSAR Manual. The idea is to go through the checklist to ensure that all required actions shall be followed, checked and considered. (IAMSAR Manual, Vol. 2) The JRCC plans do not have checklists per se but instead recommended actions and descriptive procedures to guide SAR coordination. They fulfil all recommended actions within the IAMSAR manual, but leave more leeway for improvisation, changing plans and the use of different types of resources. Often there will be some form of improvisation involved since no SAR incident is completely identical to another. At the same time having standard operating procedures with a checklist or national operational handbook would be beneficial for new SMCs and to provide standard guidelines for all parties involved in SAR.

The standard operational pattern described in the IAMSAR manual (Vol. 2, p. 3-1 to 3-9) has five stages of operations; **awareness - initial action - planning - operations - conclusion**. Although, most of the SAR incidents will never follow exactly the same pattern and should be interpreted with flexibility.

During **the awareness stage**, the involved actors or distress unit must ensure that a notification of any incident will reach the RCC, coastal radio, police or ATC. (IMO and ICAO, 2016b, p.3-4) Often in Norway, the coastal radio, police, EMCC, MCC or air traffic control receives the first information, distress call or signal. An emergency call normally arrives via an emergency transmitter, maritime VHF ch 16, MF/HF radio, or via 110/112/113 calls. If the call arrives to the police through 112 or to the ambulance service through 113 the call will be forwarded to the JRCCs.

Once the JRCC receives initial information about the emergency, the JRCC will appoint an SMC who will initiate immediate action. It is important that the SMC obtains the captain's assessment of the situation and all information available at that moment.

**The initial action stage** may include incident evaluation, which usually continues throughout all stages, emergency phase classification, SAR resources alert, and communication searches. The SMC or operations leader (RSC) is expected to declare an appropriate emergency phase; **uncertainty phase, alert phase, and distress phase**, in order to determine the appropriate actions taken and alert the relevant centres, personnel and facilities. The emergency phases should only be declared by the JRCCs, RSCs or ATC. Communication and information from the distress facility and, in maritime emergencies, the vessel captain is important to determine the correct phase. Emergency phases evaluate the level of concern for safety of people or a craft which might be in distress. The uncertainty phase means that there is a situation which should be monitored, investigated or more information obtained but does not yet require assistance from external resources. Communications can be started during the uncertainty phase. The communication search means that the JRCC will attempt to communicate with the aircraft, ship, other craft, or person in distress by all means available, and contact other sources that might be on the same area with the distress craft or person. The alert phase can be declared when an aircraft, ship, other craft or persons on-board may need assistance but

are not in immediate danger. The SMC may dispatch SRUs or other SAR assets to provide assistance if there is a probability that the situation might get worse (IMO and ICAO, 2016b).

Communication should be continued and vessels near-by asked to maintain awareness and lookout. The distress phase is declared if there is reasonable certainty that an aircraft, ship, other craft or persons on-board are in danger and need immediate assistance. The SMC will inform all interested parties including other agencies and the ship owner, try to communicate with the distress vessel, determine the availability of SAR resources, estimate the position of distress and start developing search action plans (IMO and ICAO, 2016b, p. 3-6).

The initial action stage also includes contacting all possible resources and relevant authorities to be on stand-by or start preparing for action. Such actions in maritime incidents, depending on the situation, could include alarming other vessels near-by the incident area, scrambling SAR helicopters, contacting the Norwegian Joint Headquarters for military resources such as coast guard vessels and air crafts, contacting SAR cutters from RS, contacting the fire brigades if fire on board a vessel, alarming the EMCC centre for need of ambulance and paramedics, and considering other alternative resources. If the incident requires additional resources or is near the borders of the neighbouring countries, SMC can also alarm the relevant foreign RCCs and request resources from them.

The awareness and initial action stages are crucial in order to ensure quick response. In the Arctic, due poor communications coverage and VHF, the distress signals are often sent from emergency beacons going through the Cospas-Sarsat system and is received at the MCC. The system has good coverage but only sends one-way notification without actual communication between the distress vessel or aircraft and the centre. Satellite phones are also often used in the Arctic to notify the rescue centres of distress (SARiNOR, 2016).

**The planning stage** is critical to the SAR operation and puts a lot of emphasis on the SMC/operations leader's and JRCC/RSCs staff's competence in search planning and dedicating correct response to the incident. The SMC or operations leader should always start planning even after a questionable message without full situational picture or information about the emergency. Planning is mostly commenced with as little information as possible but alarming all possible resources on stand-by and requesting assistance. Once more information is received, relevant resources will be narrowed down to the optimal solutions which might also affect or change the original plans. This might also happen during the operations stage. The SMC can request help from the other rescue controllers who can assist the SMC with communications, plotting, logging and search planning. The team should always have an alternative plan (plan 2) in case the initial plan is unsuccessful. (IMO and ICAO, 2016b, p. 4-1 to 4-3) The SARA portal provides maps based on the types of incidents and can use different types of maps depending on the context. The maritime maps will include Automatic Identification System (AIS) data for locating vessels and can generate search plans. The JRCC can also check radar data from the Armed Forces and contact the Vessel Traffic Service to gather information and improve the planning. In this stage, the SMC or operations leader can assign the OSC or ACO to coordinate operations on-scene.

**The operations stage** encompasses all activities of search, providing assistance and rescue and delivery to a safe location for sheltering and treatment. In this stage, the OSC or ACO have a major role in executing the plan and coordinating the search and rescue units that are assigned by the JRCC/RSC.

Norway has not developed national ACO procedures. The JRCC follows the procedures described in the Baltic ACO manual and the IAMSAR. The SRUs will also have standard procedures and dedicated actions for their respective units. The SMC or operations leader take a monitoring and guiding role and are responsible for notifying the OSC or ACO of changed plans if advanced information is received. The JRCC/RSC staff will also start planning subsequent searches during the operations stage in case the original plan is unsuccessful. The OSC/ACO should give situational reports (SITREP) to the JRCC/RSC during the operations stage.

Shore communication and cooperation with health care authorities and the police is important to agree on reception points, coordinate MEDEVAC and medical advice and the conduct of primary triage. The JRCC/RSC is often a focal communications point with other organizations involved in the incident. In case of major accidents, the JRCC mobilizes additional personnel. The SMC should also alarm the Rescue-Sub Centres for possible arrangements on land such as establishing a reception point or emergency evacuation centres for rescued persons (IMO and ICAO, 2016b. p.3-2 and 5-1).

The JRCCs have highly flexible staff structures that may be augmented swiftly according to predefined plans. The SMC also needs to inform the JRCC management (general manager and chief of police) of the SAR operation, if necessary. The chief of police, the SAR management board, relevant consulates and other liaison can be invited to the JRCC as needed (Ministry of Justice and Police, 2015a; 2015b).

In **the conclusion stage** the JRCC or RSC decide to suspend/terminate the operation. The SAR operation will be terminated when all persons are rescued and safe, or there is no longer any reasonable hope of rescuing people. In maritime emergencies the vessel captain, the ship owner, and the OSC will normally be informed and/or consulted before a decision is made. JRCC needs to notify all authorities, centres, services and facilities that have been activated that they are no longer needed. (IMO and ICAO, 2016b, p. 9-1 to 9-5) The SMC will also inform the Norwegian Maritime Authority and other authorities such as the police and Norwegian coastal administration if necessary. If the distress vessel requires other types of support such as pollution response or salvage, those operations will begin after the SAR operation is concluded. JRCC will also complete the record and log of the SAR case. If significant new information is received, reopening a suspended case is considered.

### **Other plans and manuals**

The JRCCs have recently updated their plans for cooperation between the SAR services and passenger ships in an emergency. According to SOLAS regulation V/7.3, passenger ships, shall have on board a plan for cooperation with appropriate search and rescue services in event of an emergency. The plan shall be developed in cooperation between the ship, the company (ship owner), and the search and rescue services and based on IMO regulations. The plan shall include provisions for periodic exercises to be undertaken to test its effectiveness. The

purpose of a SAR cooperation plan is to facilitate an efficient deployment of the joint capacities of the ship, the ship owner and the SAR services in the event of an emergency. Another objective is to enable early and efficient establishment of contact in the event of emergency between the parties and ensure that all relevant details are known to the parties beforehand and that these details are kept up-to-date. (IMO, 2003) The JRCC's new SAR cooperation plan (JRCC SN and NN, 2017) includes a description of:

- the Norwegian SAR services,
- roles and responsibilities of SMC, OSC and ACO,
- contact information of both JRCCs,
- instructions for communication and communication plan,
- location of dedicated SAR units,
- instructions for search planning,
- instructions for requesting MEDEVAC,
- information on firefighting assistance,
- on-shore reception arrangement,
- informing next-of-kin,
- suspension/termination of SAR operations,
- instructions for relations with the media,
- plans for exercises.

For land-located SAR, the JRCCs, RSCs and organisation for the volunteer rescue services in Norway have together developed a national handbook for searching for missing persons on land (Redningstjenesten, 2015). The handbook is based on the IAMSAR manual and includes guidelines for initial action, search planning, coordination responsibilities, alarming and utilizing resources, the stages of a SAR operation, risk assessment, what kind of information that should be given, response times of various resources, search tactics, incident commander responsibilities, management model, and description of various search methods and resources. Based on the manual, the police incident commander should consider the following actions for search on land:

1. Consider whether the case may be a criminal case;
2. Conduct an assessment and object profile;
3. Connect with the JRCC for advice on the task and resource utilization, specifically clarifying a reason for the use of helicopters;
4. Receive formal notification on missing person;
5. initiates the use of police resources for, among other things, to search in an immediate vicinity;
6. Utilize social media;
7. Alert volunteer rescue resources, usually Red Cross, Norwegian People's aid and Norwegian Rescue Dogs;
8. Consider summoning the local SAR management board;
9. Consider the need for staff that may be summoned by the chief of police or a deputy. It is also recommended to call in a representative from the volunteer organizations to the RSC to act as an advisor to the operation leader;

10. Consider the need for special resources, such as for example NARG, boat resources and divers (Redningstjenesten, 2015).

In the Barents Sea area, Norway follows the BEAC Barents Joint Manual (2017) and guidelines, which have been compiled for use in emergency situations requiring cross-border cooperation defined by the Agreement between the Governments in the Barents Euro-Arctic Region (Norway, Finland, Sweden and Russia) on Cooperation within the field of Emergency Prevention, Preparedness and Response. The manual is used as an operational tool for the point of contacts providing guidance and instructions for the implementation of the Agreement. The key purpose on of the manual is to:

- *establish procedures for early warning, notification, information and contact in emergency situations between the designated points of contacts;*
- *establish procedures for requesting and committing emergency assistance across borders in the region;*
- *establish procedures for facilitating border crossing of emergency response teams and resources;*
- *provide other information of relevance to the objective of strengthening cooperation* (Barents Euro-Arctic Council, 2017).

According to the Manual, notification should be sent to the point of contacts in a standardized format describing the nature, character and location of the emergency. The Manual includes a request for assistance form, including information on the type and amount of resources needed, which the countries have agreed to send to the point of contacts in case of the need for international assistance. If a country to whom an assistance request has been submitted decides to send assistance, they must inform the requesting country about available resources including scope and timeframe of the assistance. The requesting country should also provide SITREPS to the assisting country on a regular basis. The manual has a standardized form for SITREPs as well. (Barents Euro-Arctic Council, 2017) The JRCCs in Norway require a simple clearance of foreign rescue units that are sent to Norway for assisting in SAR missions. Military units will have different procedures as to cross-border assistance. Coordination for the flight information region will be handled by the ATC. Most countries have national procedures for receiving and sending units to/from other countries.

The BEAC manual is regarded as an adequate tool for coordinating and clarifying procedures for international assistance during emergencies. The Arctic countries also share an Agreement on cooperation on aeronautical and maritime search and rescue in the Arctic, which was signed under the auspices of the Arctic Council. The agreement does not, however, include operational guidance or instructions for cross-border assistance between the Arctic countries. One of the outcomes of the agreement could be something similar to the Barents Joint Manual, where the Arctic countries agree to establish certain procedures and standard forms for notification and request for assistance in an Arctic SAR handbook.

In addition to SAR operations, mass-rescue incidents at sea require cooperation with health care authorities and the police on land. *National plan for organizing healthcare services at an incident site* (2016) is a national document defining roles, responsibilities and action plans for

major incidents (Norwegian Directorate of Health, 2016). It defines roles and responsibilities for the EMCC centre, incident commander health, and medical leader at the incident site. The plan does not include specified plans for large scale maritime incidents. However, it does have procedures for mass evacuation, mass triage and CBRN incidents. A plan or guideline for establishing and running an evacuation centre in a large-scale maritime incident would be beneficial in order to further clarify procedures of the evacuation chain and setting up facilities and deploying volunteers to receive a large number of patients from a vessel in coastal areas.

Mass rescue operations are often multi-sectoral incidents, meaning that other emergency preparedness agencies in addition to the SAR services will be involved in the operations. The IAMSAR manual (Vol.2, Appendix C-4 to C-7) mentions the Incident Command System (ICS) as one of the recommended command systems and structuring tools for managing major incidents involving multiple missions, organizations or jurisdictions. In mass rescue operations there may be confusion about roles and responsibilities. Standard structuring mechanisms such as ICS may mitigate confusion emerging from agencies using different command systems and the roles and operating procedures are not defined and understood by all in advance.

Multisectoral incidents at sea can also include risk of damage to the environment from oil spills or other chemical substances coming from the vessel. If there is risk for human lives, the SAR services will first perform the SAR operation which after the Norwegian Coastal Administration (NCA), IUAs or NOFO will take control of the environmental response. NCA has a national contingency plan for environmental response and follows the Incident Command System which will be discussed in the next chapter.

Violent actions on board a passenger vessel, terrorist attack on oil platforms or vessels carrying hazardous substances are demanding “black swans”. The police is responsible for any tactical police operation at sea. The police in Norway has a national procedure for emergency institutions’ cooperation in ongoing life-threatening violence situation. The procedures for emergency institutions’ cooperation in ongoing life-threatening violence situations will also be discussed later on in *chapter 1.4*.

#### 1.1.8 Reflections on the operational patterns of the Norwegian maritime SAR system

The SAR management in Norway follows the basic structure and model of the IAMSAR Manual. In Norway, the JRCC is governed within an independent organization under the Minister of Justice and Preparedness, while in some other countries the coast guard or navy has the maritime SAR coordination role. In many countries, SAR operations are also divided with different institutions for the three main incident types; maritime, aeronautical and land SAR incidents. In Norway, the JRCCs coordinates all three. The JRCC as an organization does not operate its own resources but instead use resources and SAR assets from other organizations. The JRCCs in Norway have a legally defined right to deploy a variety of assets for example from the Armed Forces including the Coast Guard, 330 squadron helicopters owned by the Ministry of Justice and Public Security, voluntary organizations, other government agencies including police, fire and rescue services, Coastal Administration, emergency medical and health services, port authorities, and so on, as well as private entities and vessels of opportunity. The JRCCs will operate on strategic and operational levels, delegating the tactical coordination to

the Coast Guard or other vessel dedicated to the on-scene coordination duty. The JRCCs and the Norwegian Coast Guard are governed by different ministries and administrative bodies. However, they cooperate closely in managing maritime SAR operations.

JRCCs have long experience of coordinating a broad range of resources, and the SAR management boards bring in the necessary management resource and liaisons to other SAR contributing organizations. However, since Norway has several organizations and government agencies that are involved in emergency preparedness, and they all seem to have slightly different structures, operating procedures and command systems, coordination of all organizations may create extra strain. There is also a risk of communication or response being slowed down by having different points of contacts for deployed resources and there might be challenges with upholding efficient communication with two or more operation centres, on-scene coordination and the SAR units at the same time. This could potentially have an effect on information sharing, for example, the same information might not reach all parties, communication line could get overloaded or that information might get altered on the way, especially in chaotic situations. Overloaded communication lines can also create technical barriers for command and control, especially in mass rescue operations where in addition to the maritime SAR management, communications flood will also come from unified command at shore side.

The rescue services of Norway have managed to make their system function well by adapting common principles for all emergency response organizations and giving the JRCCs an authority to use all resources and act as the leading coordinator and supervisor, in the SAR system. Whenever there are human lives in jeopardy, the barriers for SAR cooperation are minimal. A positive aspect of the JRCCs being a separate civilian agency, is that there is a lower threshold to contact the JRCCs for assistance. This may be the case if the vessel in distress for some reason do not want the law-enforcement to be involved or is afraid of having done something illegal. Since the organizational structure of the JRCCs can be fairly horizontal and flexible, strategic and operational decision-making is efficient and empowered. The JRCCs are also open to cooperation with various agencies, countries, civilian organizations and academia.

Based on the IAMSAR Manual, the SAR command structure and procedures are fairly linear and roles in SAR management are well defined and established. Challenges often seem to arise from communication limitations, stressful on-scene coordination, overloading the system and multi-sectoral or large-scale incidents. Command control, distributing situational reports and maintaining situational awareness is especially important for the SMC to be able to coordinate the incident response, conduct search/rescue plan, maintain accurate logs, keep other authorities and media informed, and conduct other tasks the SMC is responsible for. For the SMC and for efficient response in maritime incidents, it is also crucial that the vessel captain and the OSC know their roles and responsibilities and have the skills to perform them properly. For this, it is important that the JRCC are manned with trained personnel to meet the mass rescue incidents, that normally may involve many units and go on for a long time.



Often the first vessel to arrive to a scene of the incident is a Good Samaritan vessel, which has been sailing near-by. Especially in the remote parts of the Arctic where government and voluntary resources are limited, vessels such as cruise ships, fishing vessels and cargo vessels can be the closest resource to the incident. The master of such vessels can be assigned to OSC duty by SMC. Without professional experience and training in on-scene coordination, this duty can be overwhelming. Overloading the OSC could lead to inefficient coordination and unreliable tracking of passengers at the scene of the incident. The sea officers have very limited education and even less training in serving as OSC. For vessels sailing in Arctic waters, this type of training should be emphasized. Arctic conditions can also cause further challenges to an inexperienced OSC and his/her crew. Knowledge of the conditions, rescue in rough weather, keeping track in bad visibility, unexpected currents and other marine conditions, long distances and response time of further resources are examples of extra challenges that an OSC might face in the Arctic. Local knowledge of the conditions is therefore extremely important for the OSC and the vessel crew. If communication for some reason is limited between the JRCC and the incident site, the OSC might have to be ready to take on some of the SMC duties such as planning the search and rescue activities. Giving timely SITREPS to the SMC might also be challenging due to the lack of communications network, which in turn affects efficient coordination and situational awareness. In the Norwegian High Arctic the lack of adequate satellite communication may severely hamper a rescue operation.

The assigned OSC must be able to follow OSC procedures at least until a more capable party arrives to the scene. This also means that captains of merchant vessels, cruise vessels and fishermen should have more training for the OSC duties in Arctic waters. When deciding how much responsibility to give to OSC, SMC must consider the endurance, communication possibilities and personnel capacities. The poorer the communication is with the SMC, the more responsibility and authority the OSC will have to initiate actions. It will, however, be a mutual discussion and decision between the SMC and the OSC on what the OSC may handle. All SRUs taking part in incident response must also know who is responsible for on-scene coordination and overall coordination of the incident and what their tasks and responsibility areas are. Therefore, the OSC must be confident in taking charge and announce leadership at the incident site. OSC must make sure that all parties follow his/her instructions, follow the search patterns and understand what their own tasks are. Since OSC responsibilities are often overloading, especially if the situation is chaotic and many things happen at the same time, the OSC will often need a support team to be able to run the tasks efficiently. Therefore, it is important that the crew has been trained for such situations and are ready to support the assigned OSC. As part of the company and vessel SAR dialogue with the JRCC before entering high arctic waters this should be a subject.

The SMC can appoint an aircraft coordinator (ACO) in SAR incidents, if the incident requires involvement of two or more aircrafts. Appointing ACO is extremely beneficial as it provides the OSC a change to concentrate on surface units and overall coordination and improves flight safety and efficiency with the aerial units sent to the scene. If communications with the SMC are not available, an OSC can also appoint an ACO, if necessary. This is, however, a more challenging task than keeping track of vessels if there are more air units involved. Coast Guard

vessels are often well equipped to accommodate the ACO desk and it enables continuous communication and efficient coordination with the OSC. The helicopter carrying coast guard vessels also have a skilled Helicopter Control Officer. Because communication and cooperation with OSC and ACO must be fluent, it would be beneficial to have both persons on a Coast Guard vessel and trained to understand each other's duties. In Norway, the ACO role and procedures are reasonably new, and staff is often sent abroad for training. One of the challenges with utilizing the ACO function in Norway, is that some aerial assets, including air ambulance and private helicopter assets, might not be familiar with the ACO role, leadership and procedures yet. Because the ACO role is to only give advice and support, the decision to follow the instructions are always ultimately done by the pilot of the aerial unit. This role, however, can be seen as a barrier in some cases of international cooperation if aerial units from an assisting country are not familiar with the ACO function and do not follow the advice given by the ACO. This may cause concern with flight safety among the other units taking part in the operation and ultimately the units that do not follow the ACO instructions might have to be given other tasks by the SMC. Knowledge of neighboring countries' SAR systems, specific functions used, and SRUs are therefore important for the SMC in order to avoid further confusion. As for air units, the limitations in operation time and range is also an important issue. Coordinating the logistics as to fueling and also the optimal location of the rescued persons is an important issue where the SMC and the ACO has to plan carefully in cooperation with the pilots, the RSC and the aviation controllers.

Since the vessel master is always in charge of any operation that happens on his/her vessel, the master and the vessel crew have a key role in assessing the situation, requesting assistance and conducting emergency response and evacuation. Sometimes communication with the JRCC is not possible and the vessel master will have to be prepared to make difficult decisions alone. Some foreign vessels and their crew might not have much experience with Arctic conditions, and for example evacuation to cold or icy waters with insufficient survival equipment might be difficult for the crew to handle. Experience from several cruise ship accidents show that the captain is late on both alarming the RCC and in evacuating.

Good communication with the ship owner is important, as they have a major role in preparedness, salvation, safety of the crew and setting up their own emergency response organization. In situations where the emergency on board the vessel develops relatively slowly or is at its early stages, the ship owner or the captain and the owner company will generally lead the response. The company response team should alert relevant authorities about the emergency situation, including the JRCC, and together with the captain ask for assistance if the incident develops further. If the company and the vessel captain for some reason do not want to alert the JRCC or disagree with suggested emergency response, the JRCC will anyway take over the coordination if the situation requires so. This might, however, create an added challenge to the response. The company often handles communication with the media, and any disagreement between the company and the leading authority might escalate the situation further publicly and even diplomatically. These situations are rare and mitigated by the SAR cooperation plan between the JRCCs and shipping companies/operators, where roles and responsibilities are agreed upon.

Beyond the technical, communication and resource challenges, several organizations involved with limited joint training in a complex operation may result in misunderstandings due to different concepts and acronym uses, organizational cultures, habits and procedures in emergency response (Berlin and Carlström, 2013; Martinussen, 2013; Magnussen, et al. 2018). During multi-sectoral operations with several agencies involved, the SMC must make sure that all participating organizations and units have understood their role, responsibility and who is in charge of the overall coordination and orders. Misinterpretations is imminent if leadership and roles are not clear to everyone.

As stated, the IAMSAR based SAR command structure in maritime emergencies in Norway is quite straightforward, where SMC at the JRCC leads the overall operational level coordination, and OSC and ACO the tactical on-scene coordination. Obviously, there are more levels to this in a large-scale incident where the strategic level would include more activity from the ministries, the SAR management board staff are mobilized headed by the chief of police, and several others including the ship owner management are important stakeholders. Although, the SAR incident will be led according to the SAR management structure, the other agencies would use their own command systems and procedures such as the Incident Command System (ICS) used by the fire and rescue services, the police P1-7 staff command system and the Armed Forces' with their procedures and command lines. The IAMSAR Manual (Vol 2, Appendix C-4) also recommends ICS for mass-rescue operations as one of the crisis management systems that could be adopted for major events where multiple organizations are involved in emergency response.

Since the ICS is widely used in Norway, it is important that the SAR management familiarizes with the ICS and rehearses together with organizations using the system. Although, the ICS does not take control or authority away from the SAR services, the ICS can be used for effective overall incident response. The ICS command structure in Norway compared to the SAR system is fairly complex with various operational and tactical layers. The roles of SMC and incident commander are very similar in SAR and ICS structures with main responsibilities being overall coordination. However, the rest of the command line is constructed very differently starting from the staff dedicated to different tasks such as finance, legal, information and safety and the second incident commander line includes various support sections including operations, logistics, and planning and environment. If various organizations start developing their own versions of the ICS, the benefits of the system can be lost. Everyone involved need to understand where, when and with who the authority and command lies in the ICS and SAR management command structure.

Multinational joint operations face the same difficulties as national operations with challenges on communication, different organization cultures, procedures, and working patterns. Challenges can be both technical and organizational. As an example, an evaluation report from Barents Rescue 2015 exercise where various organization from the Barents region exercise incident response together, noted that all countries had different working methods which resulted in lack of communication and situational awareness (Laurea, 2015). In

international SAR operations, at least on operational management level, communication is often fluent, and the working language is English. However, tactical level cooperation could face challenges if commands to SAR units are given in different languages or if units use various technical platforms. Using liaisons between foreign forces and the incident coordinators is an important tool for explaining orders, clear up misunderstandings and provide necessary information at all levels.

Another discussion related to multi-sectoral incidents and cross-organizational cooperation is, whether there should be standard operating procedures for certain types of incidents, or should the organizations develop guidelines for cooperation. Since the JRCCs in Norway do not have standard operating procedures but use incident specific plans, the SMCs are left with an opportunity for more flexible improvisation and cooperation with various stakeholders and agencies. Having checklists and clear SOPs that are open for others the familiarization is important for SAR partners and not the least for liaisons and other team members not so familiar and experienced. MRO situations are especially of concern, since they may overload the SAR system and require more coordination resources. In the MRO plans, some cooperation guidelines or plans could be developed for cross-organizational SAR management. These could cover various areas and types of incidents.

Examples are:

- joint communications plans among all relevant agencies,
- violent action response at sea
- first response triage at sea
- jointly managed reception sites
- taking care of evacuees within the healthcare services, civil defense, volunteers and the Police in MRO incidents
- communications and cooperation plans with the ICS managed agencies and the maritime SAR services

Joint exercises and standardizing or aligning procedures is a good way to reduce barriers and challenges the emergency organization might have with regards to efficient coordination and command. Inter-organizational exercises present a possibility for various emergency response organizations to strengthen their cooperation and play out the recognized challenges regarding multi-sectoral collaboration and communication. For example, Exercise Barents between Norway and Russia is increasingly important. Exercise NORD, coordinated by the Nord University, is also a good example of a joint exercise where sea-shore collaboration is tested by having scenarios where various Norwegian agencies are to be involved.

Besides utilizing various training techniques, exercises should rely on unscripted improvisation. The exercises should focus on recognized challenges and gaps in the emergency preparedness and collaboration between agencies. Based on the recognized challenges in this chapter, communication and management exercises could, for example be targeted to examine management patterns and dialogue between ICS unified command including incident commanders from police, health, fire brigades or NCA, and SAR management. Some

management exercises could also target the grey areas recognized within maritime incident management, for example, violent action at sea. Such exercises could also involve utilizing MIRC teams and authorities on-shore for evacuation procedures.

Adequate de-briefing after a major large-scale exercise can be quite challenging. Developing de-briefing processes and having common learning objectives can contribute to common procedure improvements and new guidelines, and further reduce challenges for cooperation. Common procedures and management patterns can also be tested in a simulation environment, which offers an easy way to familiarize with different command systems and play out various roles making the attendees to reflect on issues and similarities with their own procedures. Unfortunately, there are only limited resources available for analyzing the reports from incidents and exercises in Norway, especially when it comes to cooperation and coordination issues. There is also limited capacity to plan for and arrange exercises that could fill the knowledge gaps and test out new solutions.

Large-scale maritime SAR incident in Norwegian Arctic waters may overload the current system especially considering resource availability, long distances and complexity of the Arctic environment. Although, SAR management in Norway is well established and have a long history with coordinating and handling both national and international incidents, further cooperation through exercises, development of guidelines and procedures for maritime MRO together with various agencies involved in SAR in Norway would increase understanding and the efficiency of inter-organizational coordination.

## 1.2 Oil Spill Response

### 1.2.1 Main institutions in the preparedness value chain

The Ministry of Transport and Communications has the state level responsibility for oil spill response and preparedness for acute pollution in Norway. The Ministry of Climate and Environment has the responsibility for regulations as to private and municipal emergency response capacities to acute pollution. The oil spill preparedness in Norway is taking place at three levels – private, municipal and governmental in accordance with Pollution Control Act sections 40 and 43.

**Private** sector emergency preparedness involves the companies that impose the risk of polluting their environment. A special responsibility is laid on oil and gas companies operating on the Norwegian continental shelf. **Offshore operators** have an independent responsibility to plan, initiate and lead responses to acute pollution caused by their activities. These measures must be based on considerations such as environmental risk. Private enterprises also have a duty to respond and to render assistance to the government or the municipalities. All private offshore oil companies are member of NOFO (Norwegian Clean Seas Organisation). **NOFO** is responsible for maintaining emergency preparedness on behalf of the companies operating at the Norwegian Continental Shelf. NOFO serves as a coordinating organization if a spill occurs and is responsible for the tactical and operational management of response resources in use. NOFO places equipment and personnel at the companies' disposal. Offshore operators have entered into agreements through NOFO with most coastal local authorities concerning assistance if a spill from petroleum operations threatens or reaches land. According to the Pollution Control Act (sections 40-42), the government, through the Norwegian Coastal Administration (NCA), can use equipment and personnel of the private preparedness system during municipal and governmental response against acute pollution.

Public preparedness includes *municipal (local authorities)* and *state (central government)* preparedness. According to section 43 of the Pollution Control Act, **local authorities** are responsible for establishing emergency preparedness for minor cases of acute pollution which could occur and have adverse effects within their boundaries, and which are not covered by private-sector measures. The cooperation between local authorities is ensured through 32 **inter-municipal emergency response committees (IUAs)**, which cover the entire country. They have a duty to respond and, when requested by the NCA, to assist in national emergency response. Many IUAs with coastlines have signed agreements with the Norwegian Clean Seas Association for Operating Companies (NOFO) on assistance when they must respond to acute oil spills from petroleum activities. Each IUA has its own approved contingency plan.

**The central government** has a duty to ensure emergency preparedness for major acute pollution incidents not covered by local authority or private-sector plans drawn up, according to sections 43 and 40-42 of the Pollution Control Act. **The Norwegian Coastal Administration (NCA)** is responsible for the national governmental preparedness against acute pollution and has nation-wide administrative authority in the case of acute pollution incidents. In addition, authority has been delegated to the NCA to ensure the best possible coordination of operational emergency preparedness for acute pollution in a national system. To fulfill this responsibility, NCA has developed a National Contingency Plan. NCA's responsibility also entails making sure that the governmental preparedness is appropriately dimensioned in proportion to the risk (kystverket.no). The NCA has a duty on behalf of the government to maintain preparedness and respond to major incidents of acute pollution, which are not

covered by private or municipal contingency plans (NCA, 2014). This duty applies to all acute pollution from such sources as ships, shipwrecks and unknown polluters. It includes monitoring the capacity of responsible polluters to deal with their own spills. That also covers operators in the petroleum industry (NCA, 2015a).

In the cases where the party responsible for pollution incidents does not take action or implemented countermeasures are not sufficient, the NCA may take over the responsibility for managing the response operation. When there is risk of significant damage from pollution exists, the NCA can order, on behalf of central government, the private and municipal equipment and personnel available for combating the accident.

The governmental emergency preparedness system for acute pollution in Svalbard covers spills at sea as well as protection against leaks, spills from tanks, farms and other discharges on land (NCA, 2015a). NCA is responsible for the governmental emergency preparedness at Svalbard. NCA has an equipment depot in Longyearbyen. The responsibility is based on the delegation of authority in the Royal Decree (kgl.res.) 20.12.2002. NCA is the relevant authority when it comes to acute pollution, or when there is a risk of an acute pollution. The Governor of Svalbard is responsible to take action within territorial waters. The Governor of Svalbard is responsible to take action to deal with acute pollution within the territorial waters (12 nautical miles) around the Svalbard archipelago with the exception of the Bear Island, where responsibility rests with the NCA. In these cases, the Governor of Svalbard may use NCA's equipment. The NCA is also responsible beyond the 12-nautical-mile limit (NCA, 2015a). Nevertheless, the governor will always bear operational responsibility and support the initial response to a spill. In individual cases, the Svalbard Environmental Protection Act permits the NCA to delegate authority to the governor, and it does so for the vast majority of acute pollution incidents. If an incident escalates beyond the point where the individual responder cannot cope with it, and if the emergency preparedness measures of the emergency response committee (UA Svalbard) and depot resources are insufficient, the NCA will initiate and lead a government response (ibid.).

**The Norwegian Environmental Agency (NEA)** specifies requirements for emergency preparedness related to acute pollution by local authorities and private enterprise, and audits compliance with these. The NEA's primary duties are to reduce greenhouse gas emissions, manage the natural environment in Norway and prevent pollution. Its most important functions are to obtain and disseminate environmental information, exercise administrative authority, manage and advise at regional and local levels, provide specialist advice and participate in international environmental work. According to the National Contingency plan (NCA, 2015a) the NEA has the following duties in the event of pollution:

- Environmental adviser to the NCA during and after an acute incident which could involve acute pollution.
- Participating in central government responses at the NCA's incident command as a specialist adviser with environmental expertise and overviews of vulnerable areas.
- Membership of the NCA's advisory group.
- Contributing agreed emergency response resources from the Norwegian Nature Inspectorate.

- Making decisions on treatment, prevention and putting down of oil-contaminated seabirds and wildlife.
- Ensuring the availability of information on vulnerable areas in map form.
- Following up enterprises, it regulates in the event of acute pollution, and emergency preparedness for acute pollution by local authorities.
- Proposing priorities for geographic areas and environmental assets.
- Making proposals on the strategy for cleaning methods and measures.
- Making proposals on surveys required to identify the scope of pollution and its harmful effects.
- Coordinating its own resources and those of the county governor's office during a response.
- Communicating the effects of acute pollution on the natural environment to the general public, in cooperation with the NCA.
- Where required, organizing local personnel at the incident scene.

**The Norwegian Maritime Authority (NMA)** supervises ships registered in Norway and foreign ships in Norwegian waters in accordance to the provisions of the Ship Safety and Security Act. The Register's goals are to be the preferred maritime administration and to safeguard life, health, the environment and material. This supervision is intended to check compliance with requirements specified in or derived from the legislation. The NMA normally exercises such supervision in the wake of an incident, and this can lead to an improvement order. In addition, the NMA seeks to identify the potential for improving its regulations. The NMA also receives reports about maritime accidents. Information on the form and acquired during audits is systemized and structured in the accident database and utilized by a large number of users, both internal and external.

According to the National Contingency plan (NCA, 2015a) the NMA has the following duties in the event of pollution:

- The Norwegian Maritime Authority has jurisdiction over Norwegian flagged ships and for foreign flagged ships in Norwegian waters. If the NMA receives a report of actual or threatened acute pollution, the NCA's duty officer and the local police are notified immediately.
- The NMA will dispatch one or more inspectors as quickly as possible to the vessel to conduct an audit, damage survey or port state inspection.
- In the event of identified or suspected pollution from a ship, the NMA can take samples from its cargo, lubricating oil and bunker tanks.
- The NMA will consider detaining a vessel involved in or suspected of causing pollution until a bank guarantee is provided. This is intended to ensure payment of a possible penalty or fine.
- The NMA is also responsible for checking insurance policies and the like, pursuant to two international conventions – no 1 of 27 November 1992 on civil liability for oil pollution damage and no 1 of 23 March 2001 on civil liability for bunker oil pollution damage (the bunkers convention).



- The NMA will assist the NCA in accordance with an agreement entered into on 21 January 2006 (NCA, 2015a).

**Petroleum Safety Authority Norway (PSA)** is an independent government regulator with responsibility for technical and operational safety, including emergency preparedness and the working environment, in all phases of petroleum operations – including planning, engineering, construction, utilization and possible later removal. The PSA’s safety concept covers the prevention of undesirable incidents, including those which could result in acute spills. (NCA, 2015a).

In case of offshore incidents, the PSA will:

- Forward notification to the NCA and the NEA. In case of spills from the offshore oil industry, NCA and PSA will have close contact. This is regulated in the cooperation agreement between the two authorities.
- Collaborates with relevant government authorities/ agencies, including the NCA and the NEA. Regulated through agreements with the individual agency.

**The county governor** is the central government’s representative in each county, and responsible for following up decisions, goals and guidelines determined by the central government. They also exercise control over the activities of local authorities and are the appellate jurisdiction for many decisions taken by local councils. Their duties in case of the event of acute pollution include:

- Advice relating to environmental priorities, vulnerable resources, and waste management.
- Together with the IUAs, establishing an overview of:
  - suitable locations, reception sites and landfills for temporary storage of contaminated materials from an acute pollution response
  - How to avoid further pollution.
- Supervising and possibly establishing requirements if authority is delegated in specific cases to the county governor by agreement with the NEA. This regards cases when companies are discharging more than they have received permission to. The county governor (in case they have the authority) is controlling that the companies are acting in accordance with the permission. The authority to follow up the acute pollution itself is with the NCA, unless it is delegated to the county governor from the NCA. This is often done when they have given the permission to the company.
- Supervising and possibly establishing response requirements for minor acute pollution incidents if authority in such individual cases is delegated to the county governor through an agreement with the NCA.
- Assisting the NCA and/or the IUA with personnel who possess environmental expertise in the event of undesirable incidents involving acute pollution (NCA, 2015a).

**The UA Svalbard** is mobilized for an acute pollution response and serves as an advisory committee for the governor. This body consists of representatives for the office of the governor of Svalbard, the mining company and subcontractors, the local self-government Longyearbyen local government, and the airport authorities. With the exception of the

governor, these are the enterprises which have been ordered by the NEA to meet emergency preparedness requirements (section 70, Svalbard Environmental Protection Act). The governor chairs this body and commands responses to acute pollution until the NCA possibly takes over. All instances of acute pollution must be reported to the governor, who notifies the NCA in turn. If the NCA delegates responsibility for the incident, the governor decides whether to initiate a response. He or she then notifies the depot commander/ deputy commander, who mobilizes the depot personnel.

Operational responsibility for initiating measures rests with the governor if the party responsible for the acute pollution is unable to handle it. As the police authority, the governor is also responsible for securing evidence (taking samples) and investigating/ prosecuting violations of the Svalbard Environmental Protection Act – including cases of acute pollution (NCA, 2015a).

**The Joint Rescue Coordination Centers (JRCCs)** coordinate search and rescue operations. Should acute pollution arise in connection with an incident which also involves a rescue operation where human life and health are in immediate danger, the rescue action will be led by the JRCC or through the rescue sub-centres operated by the local police districts. The response to acute pollution will be led by the NCA or the IUA. The mobilization may take place before the SAR operation is finished, but normally most of the resources will be involved in the SAR operation, and the JRCC has priority when it comes to using resources for the SAR operation.

**The Norwegian Armed Forces** collaborates with the NCA. In the event of acute pollution, if required, the armed forces joint headquarter in accordance with the plan for the Organization for Coastal Preparedness (Kybal) are called on to lead responses not being handled by the JRCCs or the NCA, until the NCA reports that it wants to take over.

### 1.2.2 Organizational model, command systems and external relations

Responses to actual or threatened acute pollution are organized in accordance with the Incident command system model (ICS, in Norwegian: Enhetlig Ledelsesystem [ELS]). The NCA ICS is a further developed version of the classic Incident Command System adapted to the Norwegian oil spill response principles. According to the National Contingency Plan (NCA, 2015a) the company/operator must itself take the necessary steps to halt, contain or mitigate the effects of the spill so that damage to the environment is minimized. If an accident occurs at the Norwegian continental shelf, the company responsible for the oil spill will contact NOFO, which is obligated to perform emergency response actions on behalf of them. When notified, NOFO establishes the operation management organization within one hour. For minor events, all tasks and functions for responding to an event will be taken by one leader with their available resources. Operation management is divided into the Planning and Environment, Logistics and Operations units (Moss, 2017). In smaller events the operational management will be organized according to the following model (Fig.8):



FIGURE 8. NOFO'S OPERATION MANAGEMENT FOR MINOR INCIDENTS

For events of a larger extent, tasks must be delegated in order to handle events effectively. The organization in NOFO will be according to the following model (Moss, 2017):

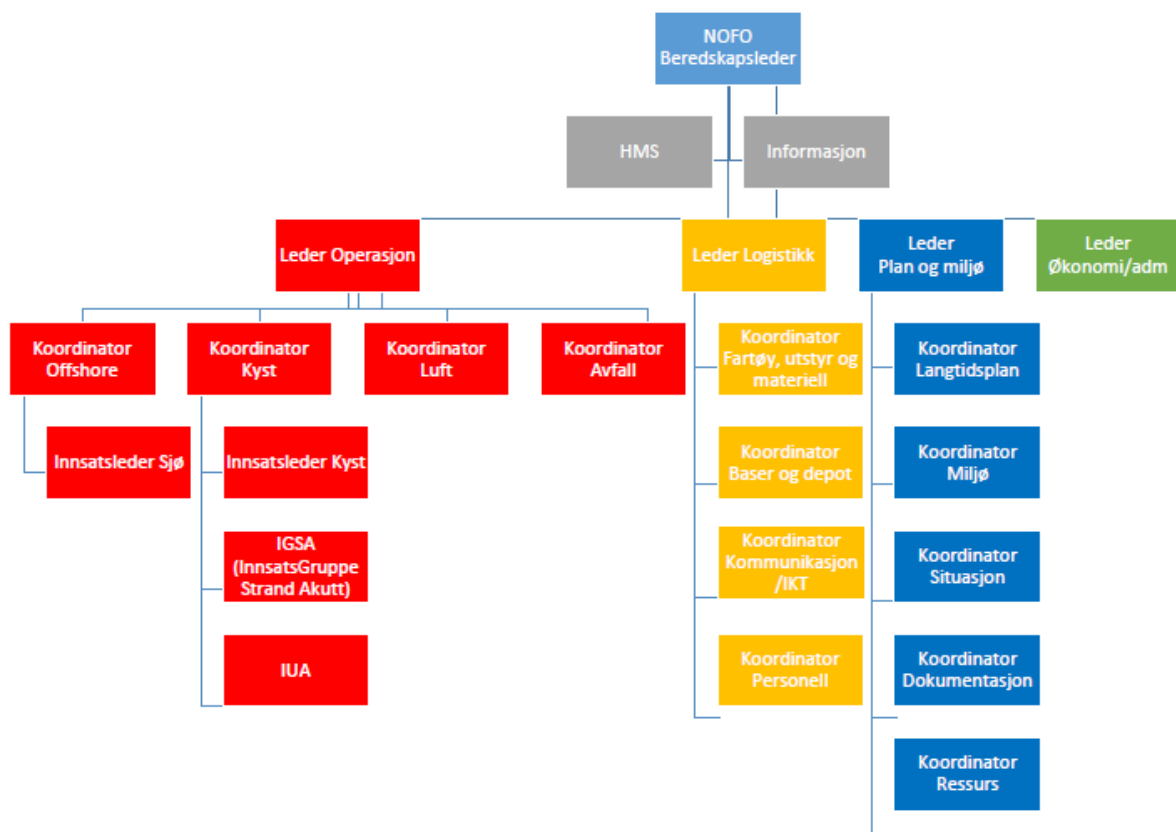


FIGURE 9. NOFO'S OPERATION MANAGEMENT FOR MEDIUM-SCOPE INCIDENTS

The structure will be scaled up effectively in case of big incidents (Moss, 2017):

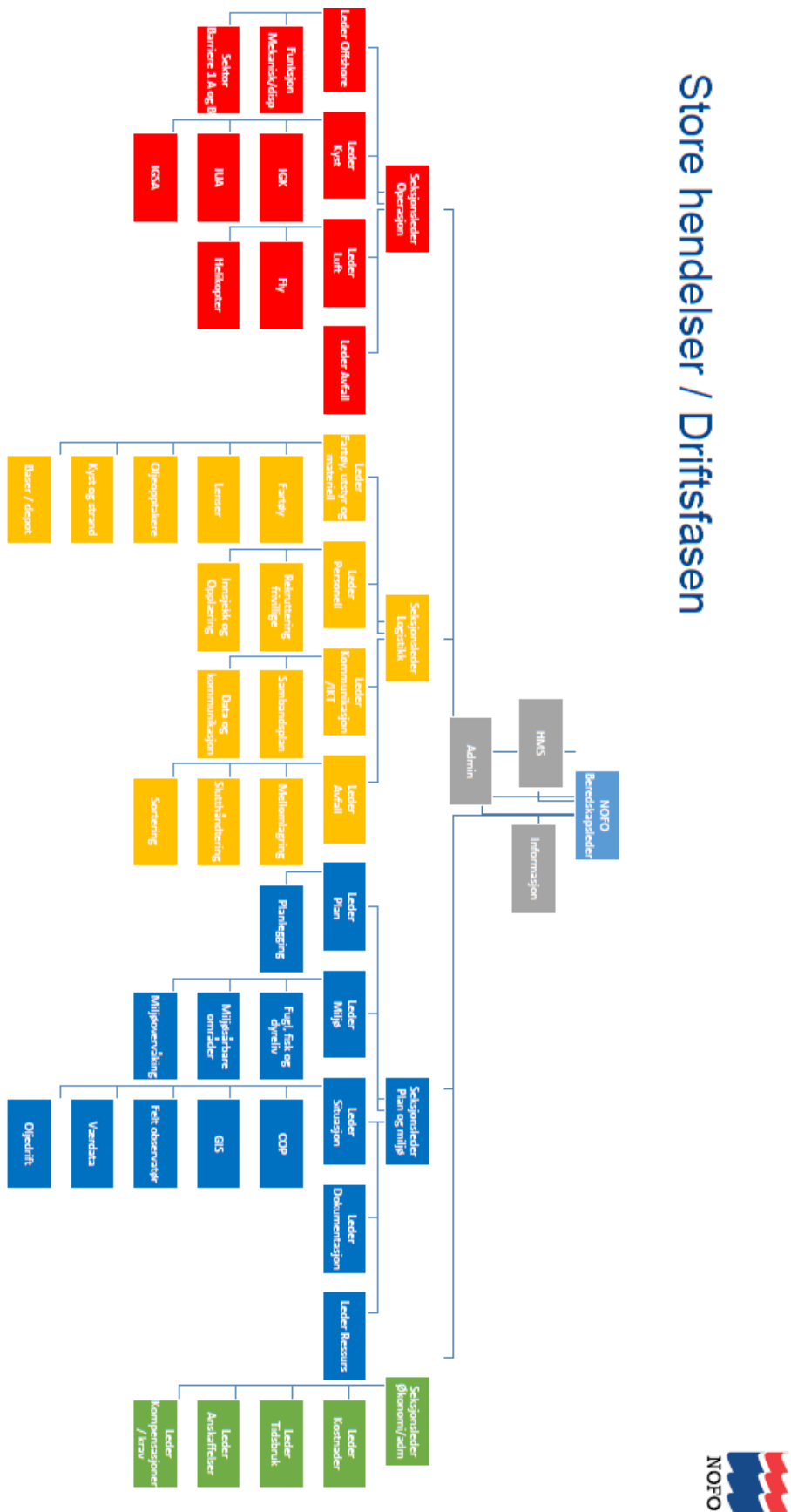


FIGURE 10. NOFO'S OPERATION MANAGEMENT FOR LARGE INCIDENTS

Should the incident be larger than the responsible polluter can reasonably be expected to deal with, it can request assistance from the local authority. When major incidents of acute pollution are reported to the Norwegian Coastal Administration, NCA will monitor the situation, evaluate possible governmental take over and mobilize resources based on the request from NOFO. If the spill seems to reach the shorelines and the government (NCA) have taken over, the mobilization is carried out in cooperation with the affected regional/municipal authority or polluter according to the Coastal Administration's contingency plan against acute pollution.

In case of larger incidents, the incident command for the oil spill response will be transferred from the operator. According to the Bridging document (between NCA and Norsk olje & gass, 2015) criteria for taking over can be:

- an incident which threatens to have a wide geographical scope with associated landfall, including:

- incidents affecting several local authorities, IUAs or counties, with a need for coordination across administrative boundaries and with many government bodies and resources involved,
- incidents with a scope, which calls for supplementary resources – over and above those planned for and covered by agreements – from government and international support agreements activated by the NCA,
- incidents of great social significance, including those posing a threat of major national consequences for the natural environment, both immediately and in the long term, posing the threat of major consequences for the nation's economy and reputation, involving significant discharges which spread to other national sectors, creating a need for government coordination.

According to section 46, subsection 3 of the Pollution Control Act, the NCA can assume full or partial command of an incident response. Should the central government take over a response in the petroleum sector, its leadership will be based on the operator's established incident command. The NCA would in the event supplement the established incident command with such personnel as are required.

The operators' response and take over might be divided into two phases. The operator will always lead the response in an initial phase. During this phase, the NCA will monitor the operator's response to see that the latter adopts relevant and adequate measures. Based on the operator's response plan and other available information, the NCA will decide whether the measures are appropriate and adequate. The NCA will keep in continuous touch with the Petroleum Safety Authority (PSA) over the development of the incident, its discharge potential and countermeasures. The NCA can support the operator during this phase with resources available pursuant to an agreement between the NCA and NOFO. Such support does not normally include senior personnel but is confined first and foremost to equipment and equipment operators in order to maintain the supervisory function. A close dialogue will be maintained between the operating company and the NCA in this phase.

During the next phase, the NCA might take over and the ELS incident command will be established. The NCA will also appoint a representative from the operator as deputy commander. To ensure continuous operation during lengthy incidents, the incident commander and deputy incident commander should be relieved by substitutes from their own organization (NCA & Norsk Olje&Gass, 2015).

In larger oil spill response operations, NOFO and the operators will be organized as a branch within larger response, according to the Norwegian ELS model, a unified incident command system (Moss, 2017). The structure is demonstrated on the Figure below.

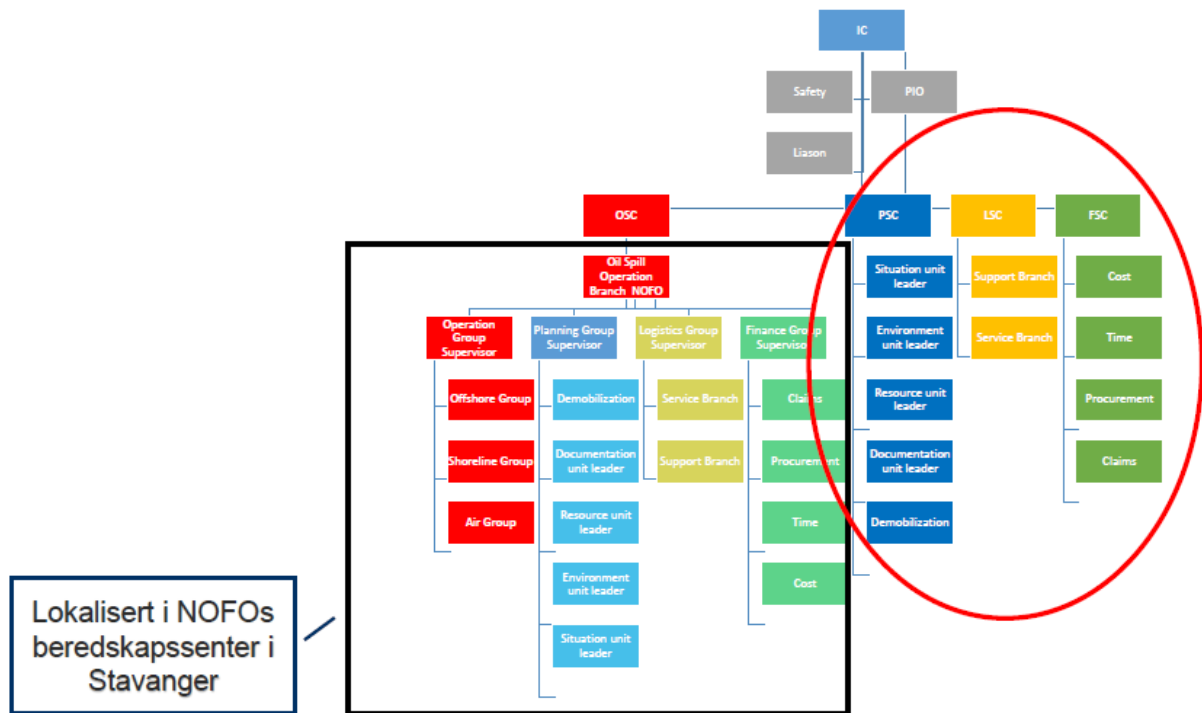
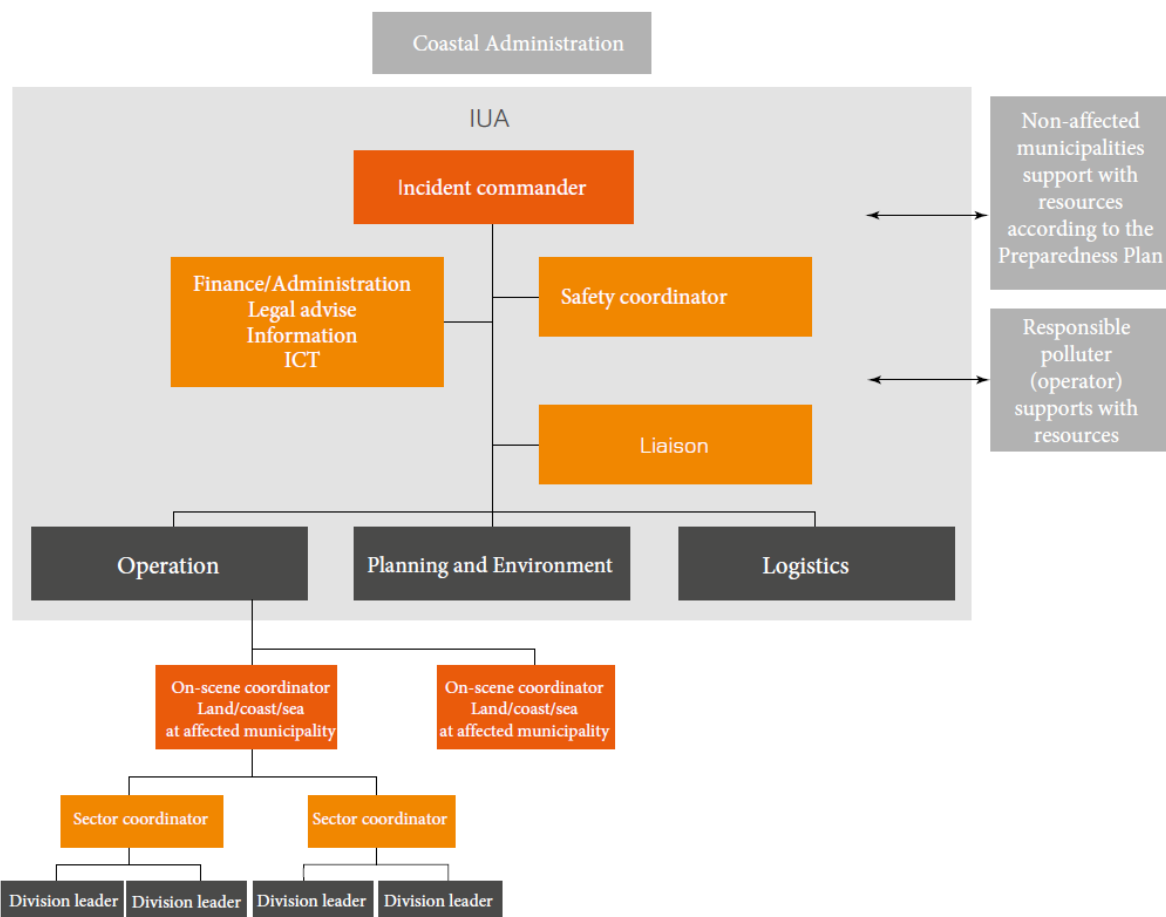


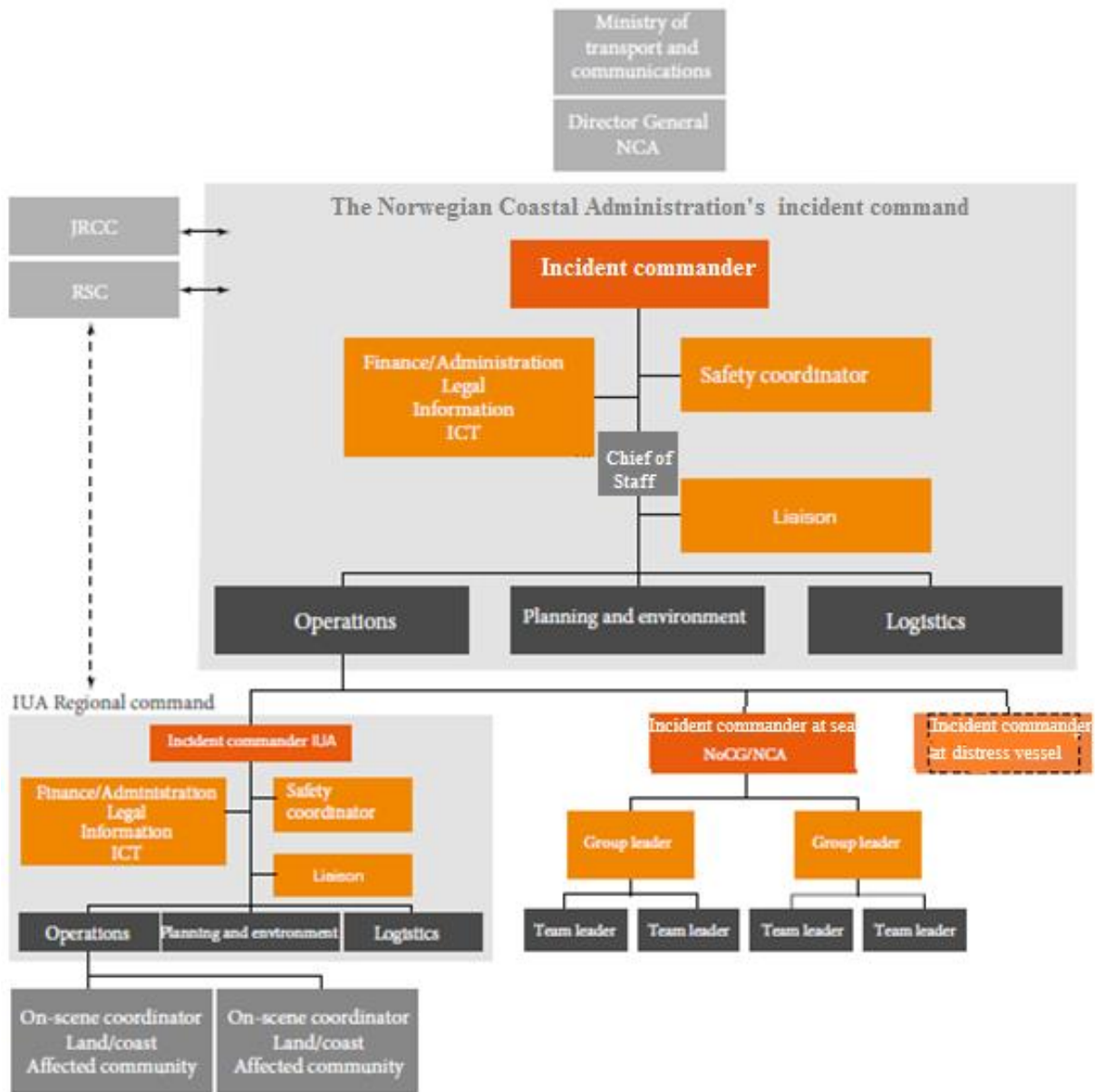
FIGURE 11. NOFO IN THE INCIDENT COMMAND IN A LARGER OIL SPILL RESPONSE

**The municipalities** have preparedness responsibility in respect to minor cases of acute pollution within the municipality's boundaries, and which are not covered by private preparedness measures. If the incidents of acute pollution are handled by the municipal preparedness, the responsible IUA or eventually a host municipality leads the response efforts. This task is often delegated to the regional fire brigade or harbor organization. Establishment of a unified command by the government does not alter the relevant operator's responsibility for dealing with the incident. The guide to the Norwegian ELS command system illustrates the operation management in this case:



**FIGURE 12. INCIDENT COMMAND WHEN IUA/HOST MUNICIPALITY LEADS OIL RESPONSE**

In the event of major acute pollution, the NCA has the responsibility on behalf of the government to maintain and develop the preparedness for acute pollution. The Norwegian Coastal Administration’s Department for Emergency Response has the main operational responsibility for preventing and identifying acute pollution and therefore manages the governmental oil spill preparedness and response resources (NCA, 2014). Governmental response is led through plans, orders and advise from the NCA. The NCA organizes the response, appoints incident commanders on land according to the number of the affected IUAs, incident commander at sea and incident commander at the distress vessel if needed (DSB, Klif & Kystverket, 2011).



**FIGURE 13 INCIDENT COMMAND DURING GOVERNMENTAL RESPONSE ACTION AGAINST ACUTE POLLUTION**

The NCA's Incident Command is located at the Center for Emergency Response in Horten and pursues the following primary functions a) planning and environment, b) operations and c) logistics. All necessary support functions are also established such as the finance, administration, legal support, information, ICT, safety coordinator and liaisons.

The figure below outlines the organization of central government responses and demonstrates the NCA's collaboration with the various agencies and institutions involved in emergency preparedness against acute pollution.



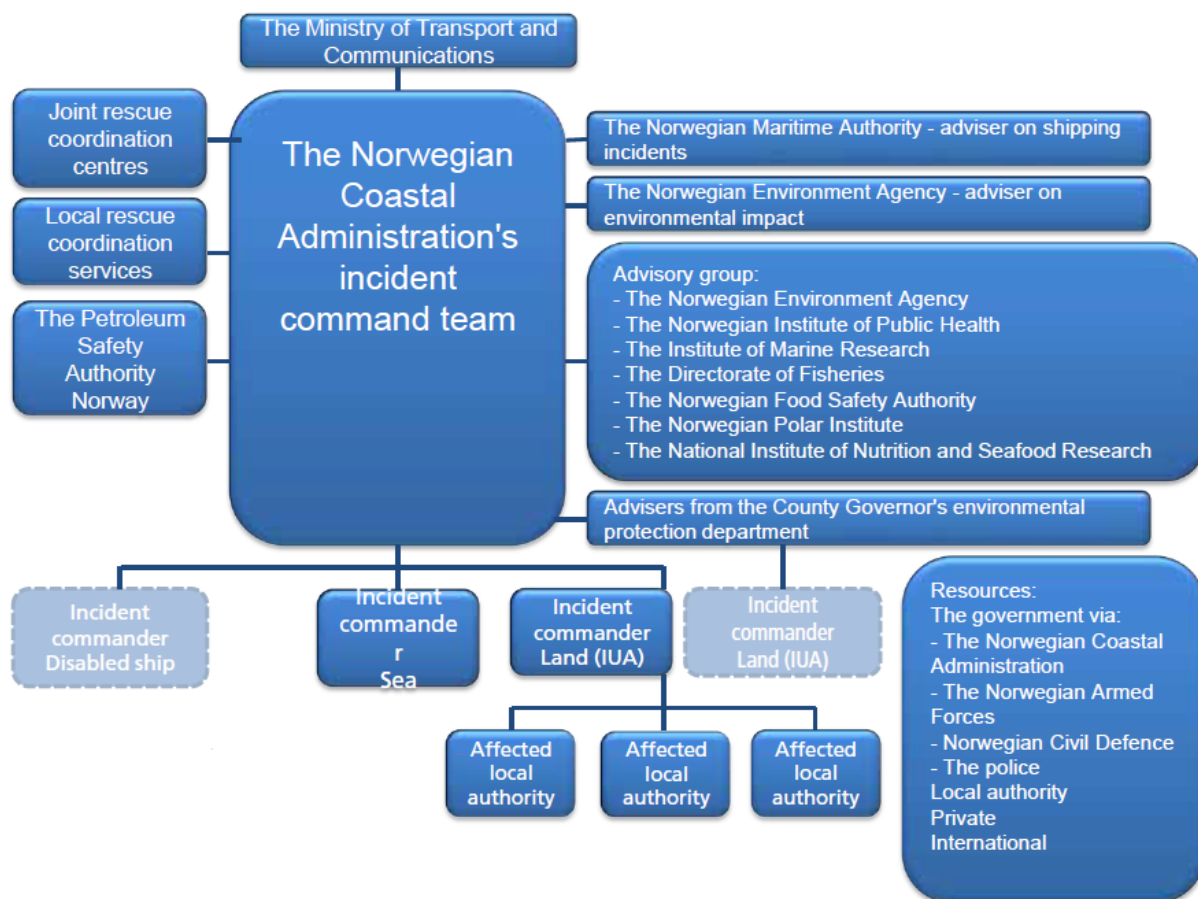


FIGURE 14. NATIONAL GOVERNMENT RESPONSE ORGANIZATION AND THE NCA'S COLLABORATION WITH THE VARIOUS AGENCIES AND INSTITUTIONS

### 1.2.3 Operational hierarchy and management responsibilities

In case of a national response operation a set of tasks, responsibilities of managers and the function teams are described in the guide for the Norwegian ELS command system and in internal documents such as Procedures for governmental action against acute pollution (NCA, 2012b), Functional plans (instructions) for the functions of the NCA's incident command and checklists (specifications).

#### Strategic level

The NCA's head office, which is located in Ålesund, is the highest governing body and the agency's central administration. The head office headed by the *NCA's Director General* has overall control of and prepares goals, strategies and guidelines for the activities of the NCA. The Director General is responsible to make sure that the NCA's objectives and priorities are met and by means of the Department for Emergency Response in Horten to keep the Ministry of Transport and Communication informed about the incident development.

The head office's *Department for Emergency Response* maintains primarily strategic tasks related to the Coastal Administration's management, other departments, media management and international actors in case for getting extra support in the acute phase. The duty officer in the department will be the contact person for the Ministry of Transport and Communication. The Department for Emergency Response subordinates to and is the

supporting facility for the Director for Emergency Response. The Department for Emergency Response will support the overall management and management of the operation, and ensure availability of the NCA's total resources, as well as all national and international resources.

*The Director for Emergency Response* is responsible for preparation of all necessary quality documents for the duty watch and response and has authority to make decisions about mobilization and dimensioning of the response. The Director for Emergency Response or the one he/she appoints will be the Incident Commander (NCA, 2012a).

*The Maritime Safety department (Sjøsikkerhetsavdeling)* will assist and take care of other priority tasks resulting from the incident.

*The communication and information department* will assist the media and information management. In major actions, the department, together with the Incident Commander the department will prepare an information strategy and monitor how the event is displayed in the media and, if necessary, correct and supplement information. This department will become a part of the incident command at operational level in major cases when the Center for Emergency Response is organized.

*The ICT center* and other ICT responsible personnel shall assist the emergency response with their resources. This department will become a part of the incident command at operational level in major cases when the center for Emergency Response is organized.

*The Regional Director's* responsibility during a governmental response is to assist with personnel, resources, local knowledge and network from the region, which is involved to the action, as well as support other tasks as a result of the incident. The Regional Director, in coordination with the Director for Emergency Response, can take an information responsibility on local level until other resources can take over.

### **Operational level**

During minor oil spill response or during the initial phase of larger oil spill response operations in the oil and gas industry, the NOFO's operation management has the operational responsibility. NOFO describes that emergency preparedness leader shall mobilize, coordinate and implement changes to the plan established by the operating company for the current situation. NOFO's preparedness leader relies on the action plan and orders provided by the operators. NOFO shall evaluate the operation independently based on current situation and submit proposals to the operating company. NOFO's preparedness leader reports to the Incident Commander (AKL) at the operating company.

Tasks for *NOFO's preparedness leader* (<http://www.nof.no/beredskap/operativ-organisering/>):

- start-up of the emergency shelter at the initial phase,
- ensure that the emergency room is ready for the entire response action,
- follow-up that personnel capacity meets the needs that the action requires,
- ensure that the meeting plan is established and followed in coordination with the incident commander,
- ensure that the correct picture of the situation is presented to the incident commander at the right time,

- provide overall status at all status meetings,
- lead all the meetings with the incident commander.

The responsibilities for *Logistics* during operation at NOFO are defined as (<http://www.nofo.no/beredskap/operativ-organisering/>):

- obtaining vessels, airborne resources, equipment, connection/ICT, personnel and vehicles according to the existing plan. They shall provide maintenance, repair or replacement of all resources.
- ensuring that the demanded personnel and infrastructure around are in place.
- maintaining local depot structure and ensure good infrastructure of the depots.

*The Operation* has the following responsibilities (<http://www.nofo.no/beredskap/operativ-organisering/>):

- manage the ongoing operations and plan for the next operation period,
- develop orders and coordinate efforts in all barriers,
- support coordinators with updates on situation picture,
- provide input to the plan for the next long-term planning period.

*Planning and Environment* has the following responsibilities (<http://www.nofo.no/beredskap/operativ-organisering/>):

- obtain overview of the external environment and prepare the long-term plan,
- build up the situational picture of operational area, provide weather forecasts as well as documenting all the activity from the emergency shelter.

*The Maritime Coordinator* has the authority from the Operation Leader to coordinate oil spill response efforts at sea at barriers 1, 2 and 3. The Maritime Coordinator shall implement the action plan that is prepared by the Planning group after the Action order for the on-scene commander at sea. The maritime coordinator evaluates and follows-up that the operation is going according to plan. Major adjustments are made in cooperation with the Planning group. The Maritime coordinator shall follow up the operation through regular meetings with the Operation Leader (<http://www.nofo.no/globalassets/pdfs/operativ-organisering/rolle-maritim-koordinator.pdf>).

During the operations with the IUA lead, the *Incident commander* has, at the level of the inter-municipal groups (IUAs), the operational responsibility for managing the response. According to the ELS guide, the incident commander shall:

1. Have an overview of the situation, plan, guide and make decisions on the strategic choices,
2. Establish communication with emergency alarm centers, emergency preparedness services, the NCA and others,
3. Have an overview of responsibilities and tasks of all functions,
4. Inform actively the assisting and relevant authorities about strategy and plans,
5. Clarify and delegate power of attorney,
6. Risk assessments and situation assessments before the effort is initiated,

7. Assess the safety and security of the task personnel,
8. Establish routines for regular information exchange (meetings),
9. Approve action plans,
10. Ensure that resources and emergency response organization are appropriately dimensioned,
11. Consider planning of command transfer and demobilization,
12. Talk to the press about the incident response action in consultation with information and other actors such as police, municipality and others,
13. Ensure the optimal utilization of resources,
14. Ensure the performance control.

During governmental response, *The Center for Emergency Response* (BES) will, together with the Department for Emergency Response, establish the governmental response organization according to the ELS principle. This organization is dimensioned to run the governmental response. The Center for Emergency Response will ensure the primary tasks for the incident command staff: Operation, Logistics, Planning and Environment, as well as will establish necessary Support Functions. The functions of the NCA's incident command constitute the organization of the main tasks of the staff:

- A. Provide the best possible basis for decision-making,
- B. Plan the efforts overall and long-term,
- C. Reorganize resources as needed,
- D. Provide assignments and framework conditions for the detailed planning,
- E. Quality assurance and approving action plans of the cooperating agencies,
- F. Collect and compile information about the efforts and effectiveness of the countermeasures (NCA, 2012d).

*The Incident Commander* will be the one who leads the entire response and signs the action orders and the action plan. The Director for Emergency Response appoints the Incident commander. The Incident commander is responsible for strategic planning, coordination and information. He/she leads and makes strategic decisions, establishes communication with other agencies, assesses risks and safety for operational personnel, and approves action plans. The Incident commander is responsible for the response action and shall organize the efforts in a safe and effective manner.

There are three teams taking care of the **primary functions**. These are operation, planning and environment, and logistics, each of them are led by a manager (DSB, Klif & Kystverket, 2011).

*The Planning and environment* function are responsible for short term and long term planning. The function has an important coordinating role, as well as responsibility for documenting, managing and preparing action plans. The function is obtaining the basis for decision-making out from available information, developing the action plan and action orders by standardized templates, ensuring efficient distribution of the action plan, maintaining overviews and maps from other functions, assessing the progress of the situation in long-term, developing a plan for the worst-case scenario, and developing alternative strategies for incident response. In cooperation with the incident commander and operation manager, the planning and

environment manager obtains information from other agencies in order to evaluate and analyze information that is necessary for planning further efforts, such as Norwegian Meteorological Institute, forestry industry and others.

The Manager for planning and environment:

- leads and establishes the necessary internal organization of the function,
- calls upon the necessary external professional expertise,
- establishes contact with other functions in the incident response organization,
- gets regular situation description and strategy for response from incident commanders and managers of the other functions,
- overviews the available resources in cooperation with operation and logistics,
- provides active information support,
- has the main responsibility for preparing the action plan.

*Operations* is responsible for implementing the action plan. The operation is required to contribute in preparing the first action order within 2 hours after the function is established suggesting combatting strategy and mobilization level. Operation must contribute to preparing of the action plan and the updated action order within 6 hours. Meeting minutes should be ready within 30 minutes after the meeting of the Operation team.

The main tasks for Operations are:

- If necessary, to ensure notification to managers of other functions, depot forces, IUAs, the Armed Forces operating headquarters, the Directorate for Social Security and Emergency Planning, and the Governor of Svalbard.
- Contribute to the preparation of the action plan.
- Implement the action plan and orders and ensure that these are understood and converted into appropriate action plans by IUAs, incident commanders and other involved actors.
- Reports from incident commanders should be forwarded appropriately.
- Assess the impact of the action taken and the need for new measures.
- Provide input to priorities for function planning and environment.
- Make sure that the operation function log is updated.
- If operational assessments and resource requirements at IUA or other subordinate units differ from the current action order, it must be clarified with the Incident Commander.
- Make sure to update the information overview where the operating units are located and what they are used for - following input from the on-scene commander at sea, incident commander IUA, incident commander at distress vessel and others.
- Ensure that the safety of the team is taken care of by following the HSE requirements and reflecting them in action orders and plans.

The manager for the operation function has the main responsibility to contribute to the completion of the action objectives. Manager for operation has the role to prepare action orders and coordinate all tactical efforts. The main responsibilities are:

- to implement the action plan and prepare the incident commander's orders,
- to manage and coordinate the operational resources,
- to provide information and situational reports to the incident commander,
- to attend meetings, report on the situation and challenges,
- to make an overview of resources that can be released.

*Logistics* is responsible for continuous overview of resources as well as supply of resources according to the demands of the ongoing operation. Manager for logistics:

- leads and establishes the necessary internal organizing in order to deal with tasks of the function logistics, for example, dealing with personnel, materials, transport, connection, provision, quartering and waste management,
- establishes contact and cooperation with other functions in the incident management, especially with Finance/Administration in regard to registration and use of the external resources,
- gets a regular situation overview and strategy for incident response,
- keeps an overview of the available resources, and the mobilized resources,
- overviews the map of command post and all facilities,
- participates in preparing of the action plans,
- identifies the demand for resources for the planned and expected situation,
- develops an evacuation plan for incident command personnel and resources.

*The Chief of Staff* follows up all the activities in the Incident Command, leads all staff meetings and contacts the function managers at IUAs or other agencies. He participates in the process of preparing the action plan. Although not well described in the Guide to the Norwegian ELS, the Chief of Staff has the central position in the organization because he coordinates the information necessary for decision making by the Incident Commander. The Incident Commander is expected to be available for holding contacts with media or Ministry of Transport and Communication and may be away from the emergency centre. The Chief of Staff facilitates the staff meetings with information exchange and decision making.

There are also **Support Functions** which are finance/administration, information, legal advice, ICT and the Safety Coordinator (DSB, Klif & Kystverket, 2011).

*Finance and Administration* shall, on behalf of the Incident Commander, take care of the NCA's tasks related to financial conditions as a result of the operation. Manager for finance and administration:

- leads and organizes staff to coordinate finance and administration tasks,
- overviews authorities, framework agreements, contracts, purchase and rental of equipment,
- overviews all the costs associated with the incident response action,
- keeps account for incident command,

- including purchasing and procurement in cooperation with logistics,
- communication with organizations about costs and salaries,
- handle claims or compensations for damaged equipment, properties and other administrative matters.

*Information* is a support function to the incident commander in order to manage internal and external collection, assessment and exchange of information. The Information manager together with the Incident commander, is responsible for creating an information strategy during government actions. The Information Manager shall:

- Stay updated about the incident command on a continuous basis,
- Track what media writes and shows (media monitoring),
- Contribute to the development of the information to be provided to the press, the media, residents, stakeholders and other relevant organizations / agencies,
- Provide advice to incident commander on information management strategy,
- Provide advice to those who are going to speak to the media,
- Establish a place for meeting and residence for the media,
- Manage the information to be approached to the incident command staff,
- Manage the information to be approached to the local communities / owners,
- Establish contact with the media and provide the incident commander with time and room for incident response,
- Identify any possible issues and work proactively,
- Develop draft press releases and distribute them,
- Develop electronic information / press releases by collecting, clarifying and confirming information, correcting media misstatements
- Organize press conferences and press views in the incident area,
- Coordinate information with other organizations that should be involved,
- In case of acute pollution there should be own guide,
- Establish routines for logging, documentation and archiving of the event and the related information actions.

*Legal support* function shall take care of legal issues for the authorities and other legal tasks. This may be related to exercise of authority, assessing legal basis, decisions on measures, execution of decisions and other formal documents, assessment of liability and insurance conditions, monitoring actions and arranging meetings on legal matters with external representatives if necessary. The manager for legal matters can assist with specific questions about procurement rules and contracts.

*ICT support* includes technical assistance in connection with use of ICT equipment such as PC, printers, projectors, networks, connectivity and access to professional applications. This function can help to ensure that necessary material is available and that the technical tools work. ICT support can give general user support and advice as needed.

*The safety coordinator* takes care of HSE- related issues on behalf of the Incident Commander. Taking care of safety and security is the responsibility of leaders at all levels including all incident command personnel. Safety efforts are managed through action plans, competence

requirements, exercises, procedures, safety instructions, and protective equipment and materials. The Safety coordinator shall:

- Lead and establish internal organization that is necessary for safety and security,
- Have an overview of the incident command efforts and the risk aspects that are important to take into account,
- Know the various safety precautions or safety instructions that apply for incident command personnel,
- Update the situation overview continuously by keeping track of all actions performed according to the action plans, information from the incident commander and other personnel,
- Provide input related to safety and security during development of incident commanders' plans and take care of security actions,
- Provide information about safety and responsibility to managers / sector coordinators and others,
- Verify that safety rules are followed in the area of incident response and to be prepared to stop activities in order to ensure safety and security safeguard the security of the personnel,
- Document and follow up any deviations by reporting to the incident commander,
- In case of accident or almost accident, communicate the deviation to organizations that provide personnel, fill out necessary forms ("RUH" and others),
- Evaluate and revise procedures and possible measures for further efforts and incorporate these into the action plan.

In addition to the organization above, an *Advisory group* can be established when it is necessary to obtain external expertise, especially in case of actions in environmentally vulnerable areas. The manager may do the risk assessments and follow up the situation. The expertise advice is considered in the action order. Advisor to the on-scene commander on land shall advise local/regional incident commanders on all relevant matters related to the response. An investigation shall also be made about the consequences of an accident to the environment.

If necessary, a *Liaison* function can be established. Liaison officers serve as a contact and a channel of information back to their respective organizations. Depending on the circumstances, liaisons can be placed to assist with any of the functions. The liaisons will provide information and help with their mother organization's resources, opportunities and any legal issues that may be revealed.

### **Tactical level**

*The incident commander at sea* is responsible for the tactical management of the operation at sea. In minor operations within the oil and gas industry the NOFO *incident commander at sea* has the authority from the NOFO's operation management to coordinate oil spill response efforts at sea at barriers 1, 2 and 3. The incident commander at sea shall implement the orders from the level above, and based on this order, give directions for subordinated units. The incident commander at sea evaluates and follows up the operation according to the plan.



Major adjustments are made in consultation with the maritime coordinator. (<http://www.nofo.no/globalassets/pdfs/operativ-organisering/rolle-innsatsleder-sjo.pdf>).

In large scale incidents the incident commander at sea has the following management responsibilities:

- Recognize the field of action and prepare an overview of the affected site,
- Provide the operational control on scene - tactical allocation of the allocated resources,
- Based on the situation picture, action order and available resources, implement and lead efforts at sea,
- On continuous basis have an overview of the allocated resources,
- Develop incident commander's order for allocated resources by developing and submitting draft plans for incident command, as well as define and convey the need for proper and adequate resources,
- Provide necessary and sufficient documentation within the area of responsibility by keeping accurate and chronological log; sending situation reports in line with template provided in action order, and by documenting and justifying all decisions and orders taken,
- Provide inputs and recommendations for operation - suggest demobilization of resources needed,
- Take samples of the contamination,
- Develop and set up coordination plans,
- Create contact and have dialogue with incident commander staff to assist with available seagoing resources if needed,
- Create contact with on-scene commander at vessel in distress to coordinate efforts on the accident site, as well as to assist with available resources if needed,
- Ensure that the operation at sea is carried out in line with the Incident commanders HSE policy by analyzing working in advance in accordance with the HSE Handbook (safe working analyses "SJA") and by ensuring "toolbox" meetings before the incident response activities.

If an oil spill derives from shipping activity, there may be an *incident commander at the distress vessel* that serves as the NCA's contact point / linkage to the owner's response action.

*The captain at the distress vessel* may lead the action with emptying the vessel and salvage. (<http://www.nofo.no/globalassets/pdfs/operativ-organisering/instruks-for-kaptein-pa-or-fartoy.pdf>). The responsibilities include all the actions of other personnel onboard the vessel. The incident commander at sea on board the distress vessel will not take over the captain's responsibilities or duties with respect to the vessel's safety or maneuvering but is only responsible for the tactical disposition of resources / efforts. Normally, there may be a salvage company hired by the owner/ship operator to empty the ship and bring it to a yard.

#### 1.2.4 Plans and standard operating procedures presenting the main action patterns

One key element of preparedness is the development of *contingency plans*, or Oil Spill Response Plans. The national contingency plan for acute pollution plays an important coordinative role for the NCA and acts as an overarching framework for contingency plans of other agencies. The plans drawn up by operators on the Norwegian continental shelf, local authorities, Inter-municipal emergency response committees (IUAs), and regional and central government authorities should back up this national contingency plan. The national contingency plan does not establish any new duties for the agencies mentioned. However, it facilitates the fulfillment of their responsibility to establish their own plans for ensuring they can contribute to the NCA's coordinated emergency preparedness for acute pollution. Emergency preparedness plans for individual industrial companies and petroleum installations as well as plans for responding within a local authority describe how to respond in the specific area. They must also describe how the parties can collaborate to reduce the adverse effects of acute pollution (NCA, 2015a).

The implementation of an oil spill contingency plan at the time of an oil spill is only the first step in a response chain. No contingency plan can take into account the wide range of scenarios that include critical variables such as the specific location, oil type, oil volume, metocean conditions, and mobile resources at risk. Consequently, each incident requires the development of an action plan to address these very specific conditions. Typically, a response will have a hierarchy of objectives, each of which may be addressed by a separate plan: those which apply to the operations as whole; strategic operational objectives; and tactical objectives of individual activities. In addition, response plans may have objectives that are site or geographic specific and/or be applicable to a defined timeline, such as daily or weekly plans (EPPR, 2015). In case of acute pollution, each IUA has its own contingency plan, approved by Norwegian Environment Agency, including procedures for organizing and handling pollution incidents. All actors that participate in the oil spill response must know their contingency plan (DSB, Klif & Kystverket, 2011).

Phases of response operations are divided as follows (kystverket.no):

1. Notification
2. Situation assessment; setting up the operation's goals and evaluate the environmental impact
3. Mobilization (personnel/equipment)
4. Spill recovery at incident site
5. Protecting high priority environmental resources
6. Limiting further migration of spills
7. Recovery of pollutant
8. Rough clean-up
9. Thorough clean-up
10. Further monitoring of impacted area if necessary
11. Environmental investigations to assess the scope of damage

*The notification of acute pollution* is an obligation of the party responsible for a case of actual or threatened acute pollution, pursuant to section 39 of the Pollution Control Act. This obligation is described in more detail in the regulations concerning notification of acute pollution or the danger of acute pollution. The following rules apply pursuant to these regulations (NCA, 2015a):

- A vessel must notify one of the Joint Rescue Coordination Centres (JRCCs) or the nearest coastal radio station.
- These have their own instructions which describe who they should notify in turn.
- The operator of a petroleum installation must immediately notify the Petroleum Safety Authority Norway (PSA).
- The PSA will ensure that the NCA and others are notified. Less serious incidents must be reported to the PSA by the next working day.
- Aircraft must notify the Notice to Airmen (Notam) office.
- The Notam office will notify the NCA, which in turn will notify relevant agencies which need to be informed about the aircraft observation.
- Spills from land-based operations must be reported to the fire brigade/emergency services by calling 110.
- Specific instructions have been drawn up for emergency service operators, including who they should notify.

Where Svalbard is concerned, the obligation to notify is governed by section 70, subsection 3 of the Svalbard Environmental Protection Act, and by the cooperation agreement between the governor of Svalbard and the NCA.

The petroleum industry's obligation to notify is governed by the section 29 of the management regulations. The NCA has its own emergency response system for receiving and following up notifications which is described previously in this report.

There are also bilateral and multilateral agreements on notification and assistance from neighboring countries. Norway has cooperation agreements with all of its neighbors and can also request assistance through the EU. A Host Nation Support system has been established to ensure that possible assistance from other countries is managed in a satisfactory manner. Those who provide assistance to Norway are followed up from the moment they cross the border until the assignment has been terminated. An EU document on host nation support guidelines has been further developed by the DSB into a set of Norwegian guidelines. The NCA has established routines for incidents involving acute pollution which accord with these guidelines (NCA, 2015a).

#### *Standard procedures*

The NCA has established standard procedures to guide the emergency response.

*The procedure "For preparedness and actions in the NCA"* (NCA, 2012a) ensures that the NCA has plans for all types of incidents in which the NCA has a primary responsibility as specified in the Pollution Control Act, the Svalbard Environmental Protection Act, Ship Safety and Security Act, to monitor, supervise, assist or implement measures and / or take actions to

avoid and limit the damage. The procedure describes roles and authority for those who have watch duty and will be involved in the action management. The procedure outlines principles for the NCA's preparedness and notification, preparedness organization in the NCA, including watch and action organization, responsibilities, roles, tasks and principles for planning.

*The procedure "About information and notification of acute pollution or threat for acute pollution"* (NCA, 2012c) is a document which describes routines for information and notification within the NCA, to the Ministry of transport and communications, and to the external partners involved in emergency response against acute pollution, threat for acute pollution and in organization of the state action response. This procedure is used by the watch organization which includes duty officer at the Department for Emergency Response and the watch team at the Centre for Emergency response. The procedure is also implemented in the specific procedures for Vessel Traffic services (VTS), pilot boats, pilot boats operators, preparedness watch team. The document outlines the primary and secondary communication flows when it comes to notifications.

*The procedure "Watch – preparedness for acute pollution"* (NCA, 2012e) describes the responsibilities and roles of the NCA's preparedness watch team. The procedure also describes the transition from the management organization of emergency response by watch team to the organization of the governmental response. This includes the outline of the main tasks and responsibilities.

*The procedure "Governmental response against acute pollution"* (NCA, 2012d) describes how the NCA is organized under governmental action against acute pollution. The procedure outlines the process of organizing the incident command, presents the Norwegian ELS principle and describe shortly the tasks for each function in the action management. It refers to *the Function Plans*, the internal documents of the NCA that exist for each primary and support function and *the Guide to the Norwegian ELS* that presents the unified command system and terms in more details.

*The procedure «Health Safety Environment during actions against acute pollution"* (NCA, 2012b) guides how to act with compliance to the Working Environment Act and internal control regulations on systematic HSE work. The document clarifies responsibility and refers to the minimum requirements that apply to the action organization, function managers and other personnel. The procedure includes a description of the overall objectives of the HSE work and the system established to achieve the objectives during governmental response against acute pollution.

#### 1.2.5 Reflections on the operational patterns within oil spill response

A number of national, regional and local agencies and organizations have a responsibility to take action in the event of oil spill or acute pollution in Norway. The system is fragmented especially at the local level, but is linked together with agreements, a common organizational structure, and standard operating procedures. The professionalized oil spill response in Norway follows the incident command in line with the Norwegian ELS model. That makes up-scaling and involving more units easier. In addition, there is a coordination challenges related to the vessel captain, the ship operator and owners, and the salvage company hired to save

the vessel. The insurance company will also have a word in the priorities done. Finally, there are other stakeholders such as owners of coastal area contaminated, government environment agencies, environment organizations, municipalities, politicians, the media and the public. This calls for careful handling of each step, the use of advisors and liaisons, and good information channels both horizontally and vertically.

The plans for the action will be scrutinized in hindsight. Thus, the development of contingency plans is an important element of emergency preparedness. The national contingency plan for acute pollution is an overarching framework for contingency plans of other agencies. Emergency preparedness plans for individual industrial companies and petroleum installations as well as plans for responding within a local authority describe how to respond in the specific area. However, no contingency plan can take into account the wide range of scenarios that include critical risk factors. An important prerequisite for the plan to function as intended is regular exercises and evaluations after these. The experience after implemented actions must also be incorporated into the plan (NCA, 2015a). A very important aspect is the systematic evaluation and detailed reporting of experiences from real incidents and exercises. The revealed gaps may serve as a platform for developing realistic exercises including large scale incidents with a large repertoire of resources.

One important aspect is the up scaling of the incident command system and improvisation in case of limited professional resources. This may call for adjustments in the management system, recruitment and training. It is important to train and exercise all the management levels in scenarios that are both large, remote and not easily predicted. This is not the least the case for the challenging operations in the Arctic, and the icy waters in the High North.

### 1.3 Firefighting

Fire on board a vessel poses a great risk for the safety of persons on board and the vessel. Ship fires often spread fast and may cause explosions and dangerous smoke inside the compartments and few safe havens. Fire safety on ships is governed by maritime legislation, and after the Scandinavian Star incident, a number of measures have been implemented by the maritime authorities, which have strengthened fire safety at sea. Fire safety on vessels is primarily dependent on precautionary measures taken on-board and the ship owner's emergency preparedness plans. The vessel's own safety crew with basic education as smoke divers will have to start the firefighting measures during an incident before receiving assistance from a land-based fire department. To support rescue measures and firefighting carried by the ship's crew, Maritime Incident Response Group (MIRG, RITS in Norwegian) teams, operated by local fire departments, have been trained for special maritime SAR situations and smoke diving on board vessels.

Fire safety on a vessel is first and foremost the responsibility of the ship owner and the captain. One of the major challenges with ship fires also relate to decision-making on whether to bring in external firefighting assistance and how long the firefighting measures should be carried out before the passengers are evacuated. Response capacities is limited by distances, long response times and rough weather conditions.

Fire safety depends on the presence of relevant equipment and countermeasures on board, the effective functions of the ship's preparedness system, and crew members' abilities of fire prevention, firefighting, smoke diving, search and rescue, and evacuation. The crews' ability to prevent and put out fire is extremely important in Arctic waters, where response assets are scarce and response times long. The captain of the vessel will have to communicate and agree upon any external rescue and firefighting measures closely with the JRCC and the fire chief. This chapter focuses mainly on firefighting measures for maritime incidents and MIRC procedures in Norway.

### 1.3.1 Main institutions in the preparedness value chain

The Norwegian Directorate for Civil Protection (DSB) is the responsible authority in Norway that coordinates municipal fire department rescue services. DSB reports to the Ministry of Justice and Public Security. DSB develops legislation, regulations, guidelines within various disciplines, and manages and enforces among other things Fire and Explosion Protection Act and Civil Protection Act. DSB's areas of responsibility include local, regional and national preparedness and emergency planning, fire safety, electrical safety, handling and transport of hazardous substances, as well as product and consumer safety. DSB also manages the Norwegian Civil Defence, the Emergency Planning College, the Norwegian Fire Academy (Norges brannskole) the Civil Defence Academy and the Norwegian Support Team, which is an internationally focused emergency capacity (DSB, 2015).

The government has set the Fire and Explosion Protection Act of 14 June 2002 and a regulation of 26 June 2002 No. 729 on the organization and dimensioning of the Fire Department of 2002 to complement the Act. These regulations will ensure that every municipality has a fire department that is organized, equipped and staffed, so that duties imposed by the regulations are carried out accordingly. Furthermore, the regulations will ensure that the fire service is organized based on the current risk and vulnerability assessments. It is the responsibility of each municipality to organize their fire and rescue departments and decide on how to allocate their resources. (DSB, 2015)

The fire and rescue services have various tasks including:

- Firefighting and fire prevention
- CBRN/E –HAZMAT (chemical, biological, radiological, nuclear and other hazardous materials prevention)
- Rescue/smoke diving
- Inter-municipal oil spill protection
- Maritime incident (RITS) operations
- Traffic accidents - vehicle release of persons
- Salvage rescue (Insurance company)
- Assistance in all types of accidents
- Assistance for all rescue agencies

The fire departments have, upon request, the duty to assist in fires and other maritime incident situations within or outside the Norwegian territorial boundary. The duty is general and applies to all fire brigades with coastal affiliation. DSB is responsible for organizing MIRC teams and operations in Norway's search and rescue region. DSB signs contracts with

municipal fire and rescue services for their provision of the MIRG teams. (DSB, 2018) Norway has currently signed agreements for MIRG teams on continual stand-by in:

- Bergen (Bergen brannvesen)
- Larvik (Larvik brannvesen)
- Oslo (Oslo brann- og redningsetat, OBRE)
- Stavanger (Sør-Rogaland IKS)
- Bodø (Salten Brann IKS)
- Tromsø (Tromsø Brann og redning)
- Ålesund (Ålesund brannvesen KF)

Some of the MIRG teams in Norway (Oslo, Stavanger and Bodø) are currently located next to the SAR helicopter bases, which means that these teams can be deployed slightly faster than the other MIRG teams. In addition, several local fire and rescue services have capacity for response at sea but do not have an agreement for MIRG services with DSB. (DSB, 2018)

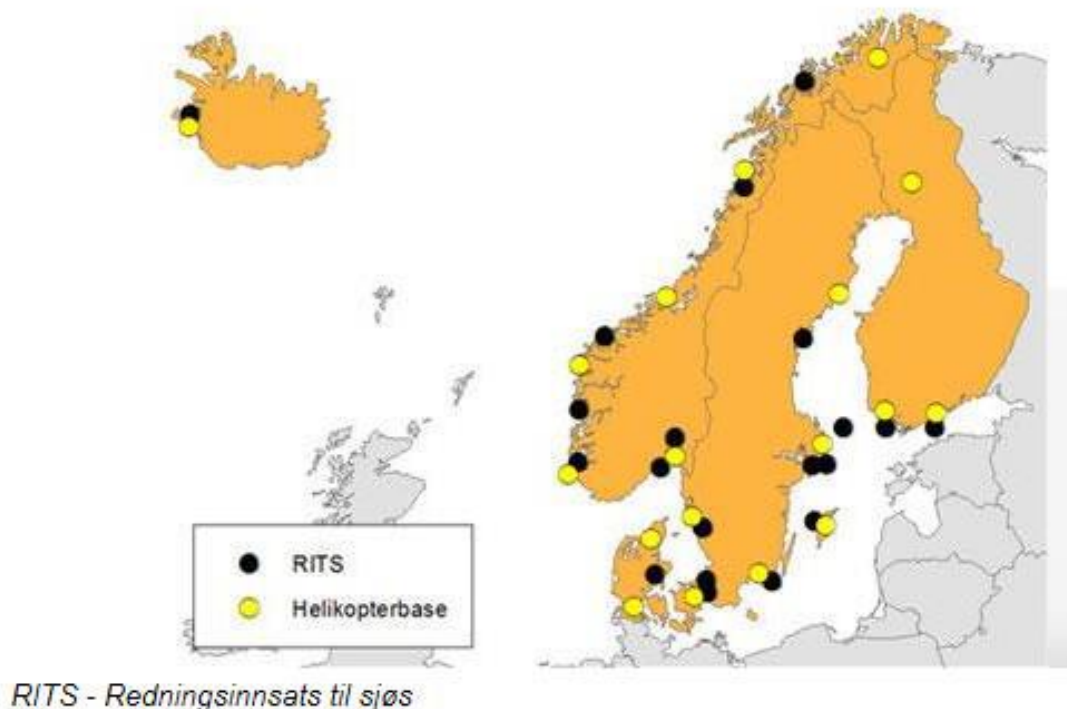


FIGURE 15. LOCATIONS OF AVAILABLE MIRG (RITS) TEAMS

Typically, MIRG operations focus on ship fires, but may also involve a range of damage-prevention tasks, help with evacuation and first aid. In 2011, DSB and the Coastal Administration agreed to investigate the possibility of MIRG services providing assistance for the Coastal Administration related to chemical preparedness. MIRG preparedness is also available in case of accidents on land. In addition to the MIRG teams, there are several fire brigades that have built up their maritime preparedness locally, but do not have a separate agreement with DSB. (DSB, 2018)

JRCCs also have a key operative management role in the preparedness value chain when it comes to firefighting measures at sea. JRCCs are responsible for coordinating and requesting MIRG operations, finding and coordinating suitable resources for transferring MIRG teams to the incident site and maintaining the leading operative responsibility of SAR efforts.

The Norwegian Maritime Authority is responsible for enforcing and following up on regulations for fire protection on ships (Norwegian Maritime Authority, 2014). This is a key part of the strategic framework since the vessels will have to comply the fire safety rules in their contingency plan. Thus, the ship owner and companies also have a key role in the preparedness value chain as they will have to manage the fire safety and emergency procedures for their vessels including competence management of the crew to put out fires and function in emergencies.

### 1.3.2 Organizational model, command systems and external relations

The Ministry of Justice and Public Security's department of public security is responsible for the governance and the administrative steering of the Norwegian Directorate for Civil Protection. DSB has a director and two deputy directors. DSB has eight departments within the organization; knowledge development and digitalization department, coordination and preparedness department, prevention and safety department, emergency and preparedness communication department, the Norwegian Civil Defense department, administration department, communications department, and HR department. The fire and rescue services fall under the prevention and safety department (DSB, 2018b).

The municipalities in Norway are responsible for organizing the municipal and local fire and rescue services. There are approximately 260 fire departments in Norway. Several fire departments are inter-municipal. The fire departments in the largest municipalities have full-time employed fire fighters. Most of the fire departments in Norway have part-time employed fire fighters. A lot of the municipalities in Northern Norway are small and recruit part-time employees and volunteers. Each municipality will organize the fire and rescue service as they see fit. Municipalities are expected to seek cooperation with other municipalities in order to maximize the utilization of overall competence and resources in the region, and that preventive work is carried out properly in each region. Municipalities or regions can, in addition to any cooperation agreements, also sign agreements with neighbouring fire brigades, industry stakeholders, airports, Civil Defence, the Armed Forces, etc., in order to facilitate or receive emergency assistance in acute fire and accident situations. Agreements will also define the procedure for requesting assistance (DSB, 2015).

In order to function in a crisis, disaster or war situation, the fire service must have a clear management and command structure. This is necessary to ensure an efficient organization during incidents and daily operations. Fire chiefs lead and coordinate municipal fire departments. Each fire chief must also have a deputy. In municipalities or fire department regions with more than 20.000 inhabitants, the fire and rescue service must have a full-time employed fire chief. During an incident, the watch leader or fire chief will take the overall lead of coordination and function as an incident commander. The fire chief, or the person taking command on behalf of the fire chief, can request assistance as soon as a fire or accident



threatens to grow to such an extent that the already established preparedness is insufficient (DSB, 2015).

Municipal fire departments must have a prevention department and an emergency preparedness department. The departmental management in each municipality or region shall ensure coordination of activities within the fire department's prevention and emergency departments. The fire chief and department heads shall ensure that the municipality or region has sufficient resources to perform the fire and rescue service duties (DSB, 2015).

The head of the prevention department is responsible for ensuring that realistic plans for preventive tasks and activity are established every year. The head of prevention department is also responsible for ensuring that preventive tasks are performed according to the guidelines set by the government. The preventive department is responsible for undertaking measures to reduce the risks and consequences of fire in society (DSB, 2015).

The department also does risk-based prevention including identification and assessment of the risk and consequences of fire, implementation of risk reducing measures, risk and vulnerability analyses, evaluation of events and other measures aimed at certain risk groups (DSB, 2015).

One of the most important tasks for the head of the emergency preparedness department is to lead task forces that are called out for firefighting or other incidents. The head of the department is responsible for following up and ensuring that all personnel hold the necessary competence (basic education and other necessary specialized training) to perform fire and rescue services. The emergency preparedness department shall ensure that exercise plans are prepared. The department also has the overall professional responsibility for ensuring that the equipment is satisfactory both in scope and function (DSB, 2015).

An important part of the fire and rescue services is the Emergency Alarm Centre (110 operation centre), which is responsible for receiving emergency calls, alerting the fire brigades and other resources, and communicating with other alarm centres such as the Police (112), EMCC centres (113) and the JRCCs. The emergency alarm centres will maintain an overview of the available resources and the resources and teams that have been assigned to an incident site. The municipalities within a region shall be connected to a joint emergency alert center which shall at all times be able to receive reports of fire and other accidents and take appropriate measures (DSB, 2015).

A municipality should establish or connect themselves with a regional emergency alarm center for receiving reports of fires and other accidents within a defined region. These regions with 110 operation centres include several municipalities. There are currently 15 (eventually 12) emergency alarm centres in Norway. Emergency alarm centres should have permanent staffing of qualified personnel and be manned to ensure that any message is received, registered and followed up on. DSB also manages Nødnett, which is a digital communication network for the police, health care services and fire and rescue services. In addition, Nødnett can be used by other organizations participating in rescue and emergency work such as the JRCC. Nødnett aims to simplify the communication with emergency agencies. Nødnett can be used through TETRA radios, which are also used with rescue services in some of the other

foreign countries. This allows more fluent communication with other nations' resources and operations centres (DSB, 2015; 2016).

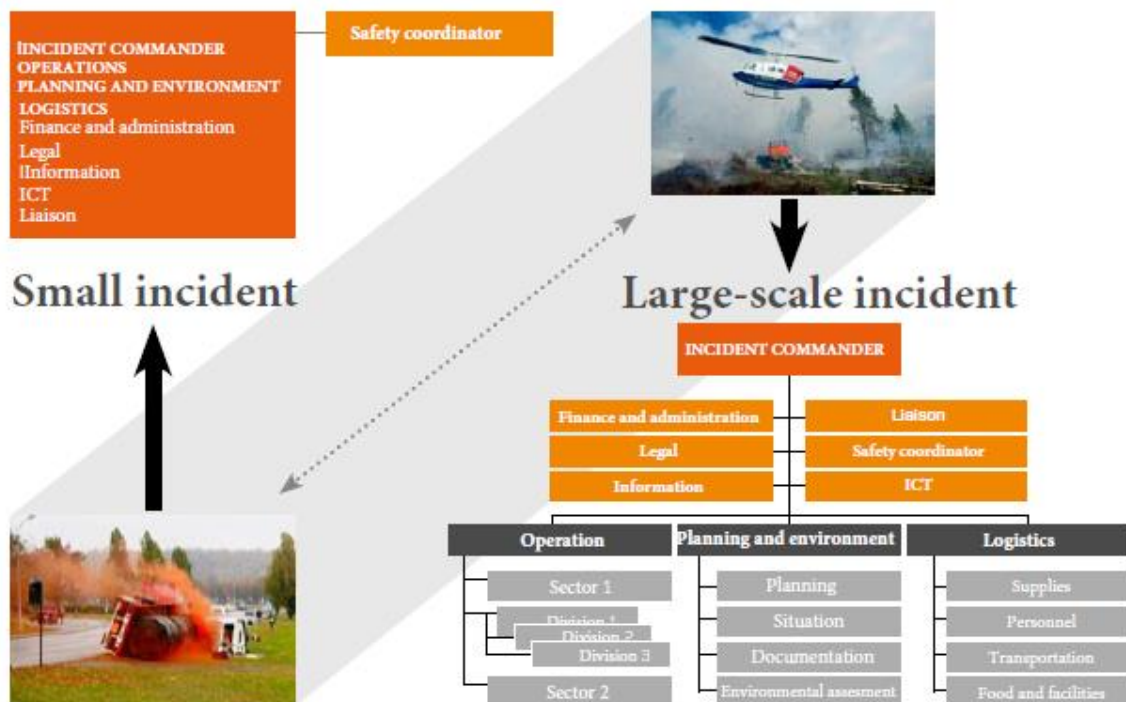
In order to provide necessary resources and expertise, municipal fire and rescue services work in close cooperation with for example other municipalities, the Police, healthcare authorities, volunteers, Civil Defense, Armed Forces, private companies offering resources, Norwegian Coastal Administration, JRCCs, 330 squadron with SAR helicopters, airports and in maritime preparedness also with the Coast Guard, RS, shipping companies, cruise lines and other operators. The most common form of emergency preparedness cooperation for fire and rescue services is an agreement in which another municipality or private enterprise assumes responsibility for efforts in all or part of the municipality. Agreements for assistance can be signed in order to facilitate simple form of cooperation with another municipality, other emergency organizations, or private enterprises where needed services exist. Continuous contact with the Police, healthcare authorities, Civil Defense and other organizations will also form cooperation patterns. All other forms of cooperation must also be based on coordinated action plans and mutual information about each other's resources, facilitating joint exercises, organization at the incident site, connection and communication, and so on (DSB, 2015).

In situations where international assistance is required, Host Nation Support (HNS) system is used to receive and provide assistance from other nations. DSB is responsible for developing the national HNS framework for receiving international assistance in the event of emergencies and disasters. Based on the EU's Host Nation Support Guidelines, the DSB guidelines define HNS as: *"...the civil sector system that ensures good, efficient and effective reception of assistance to Norway in the form of equipment or personnel from abroad in a situation where the responsible authority does not have the necessary resources available to manage a major incident and therefore requests these from other countries"* (DSB, 2014, p.6).

DSB's HNS guidelines has three main goals. First, the guidelines aim to provide information about the HNS system and already existing international procedures for cooperation including contact points for assistance to and from Norway. Second, the guidelines build on national regulations and facilitate the reception and dispatch of assistance in emergencies. Third, the guidelines are intended to make the reception of assistance from other nations as efficient as possible. Each sector must draw up plans for managing incidents where Norway requests assistance in civil emergency management. (DSB, 2014) In the Barents Sea area, Norway also follows the BEAC Barents Joint Manual and guidelines which also cover the fire and rescue services (Barents Euro-Arctic Council, 2017). The Nordic countries have agreed on cooperation with NORDRED (nordiskt samarbete inom räddningstjänsten) Agreement on Rescue Services between Nordic Countries (1989). The NORDRED agreement cover cooperation between the Nordic countries in cross border emergencies and crisis preparedness including resources with facilities, personnel and equipment. Any foreign assets and resources will be placed under the host nation command and coordination (NORDRED, 1989).

The fire and rescue services in Norway also follow the Incident Command System (ICS) (ELS in Norwegian) model. Figure 16 shows the ICS models for small and large scale incidents within the fire and rescue services. The ICS system was originally developed for fire departments fighting wildland fires in California in the 70's. Since then, the ICS approach has turned out to

be suitable for a wide range of emergencies, such as fires, hazardous materials spills recovery, and multi-casualty accidents of nearly any size. (DSB, 2011) The International Aeronautical and Maritime Search and Rescue Manual (IAMSAR) that steers SAR procedures, also recommends the ICS model as one of the possible ways of organizing crisis management in major incidents and mass rescue operations. In general, the ICS organization includes five major roles: incident command, planning, operations, logistics and finance/administration. (IMO and ICAO, 2016b) Norway has adopted the same model with national variations.



**FIGURE 16. INCIDENT COMMAND SYSTEM (ELS) ORGANIZATION IN SMALL AND LARGE SCALE INCIDENTS IN NORWAY (SOURCE: DSB, 2011)**

The fire chief appoints an incident commander who will lead a response operation the entire time and approves an action plan and action order. The incident commander is responsible for strategic planning, coordination, information, and control. He leads and makes operational decisions, establishes communication with other agencies, assesses risks and safety for task-force personnel, and approves task-force plans (DSB, 2011).

There are three primary sections for managing the main functions in the incident; operation section, environment and planning section, and logistics section. In addition, there will be staff managing the finance and administration, legal issues, information and press, safety coordination, ICT and liaison from other organizations, if necessary. All these sections and staff will operate under the incident commander's orders and command. (IMO and ICAO, 2016b) The responsibilities of each function will be described in the next section of this chapter.

The Incident Command System will be used in mass-rescue operation and large incidents however will not take over the SAR procedures if there is need for SAR operations and actions

(especially maritime and aeronautical). If the ICS is used for coordination of large incidents, the coordination of SAR functions and other organization in the ICS can also be achieved by placing a representative from the SAR services to the ICS operations section. This way the ICS organization can maintain the overall coordination, however the SAR services can function independently according to SAR procedures and focus on the lifesaving tasks.

Firefighting and MIRG operations at sea will be coordinated from the JRCC following SAR procedures and command system (*see chapter 1.1*). In case on fire on board a vessel, the SMC can call a fire brigade liaison officer to the JRCC to provide advice on the SAR operation regarding firefighting, smoke diving and MIRG operations. The liaison would most likely be the fire chief or a deputy, who will provide assistance with firefighting resources and other matters. The fire chief can at the same time man necessary staff to the office at the fire department and establish a crisis room. The staff and operations at the fire department will follow the ICS structure. The logistics function will normally be established, with a responsibility to acquire for example personnel, materials and facilities, evacuation plans if there are injured people, next-of-kin contact and other logistic and informative tasks (DSB, 2011; IMO and ICAO, 2016b).

With regards to maritime incidents requiring firefighting, smoke diving, and other fire and rescue services at sea, the JRCCs may request assistance from the municipal fire departments if needed. If the request for assistance to ships or other vessels is received from another source than the JRCCs, the fire department shall immediately notify the responsible JRCC of this. The 110 operations centre will also be notified and kept up to date on firefighting operations at sea. With maritime incidents, the fire and rescue services engage in operations based on their normal capabilities to operate on water. (Saltén Brann, 2011) As noted before, Norway has MIRG teams specialized in firefighting and rescue operations at sea. All teams are available for deployment in within Norway's search and rescue region (SRR) and, according to the contracts, also within other countries' SRR. The JRCC and SMC can request assistance and MIRG teams from other countries as well.

MIRG operations involve the deployment of one or more MIRG teams to a burning or otherwise disabled vessel that needs assistance from the fire and rescue services. The fire chief will make the final decision on whether to send out their MIRG team to the incident. The fire chief must assess the safety of the team and consider the fact that the team itself will also have to be evacuated if the fire cannot be controlled. The captain of the ship will have the final word as to accepting MIRG resources on board. The size of a MIRG team in Norway is normally six, 1+1+4(2x2), including a MIRG operation commander, a smoke diving leader, and two teams of two smoke divers working in pairs. The team structure may vary depending on the nature and distance of the incident and operation; however the size of the team is normally six (Saltén Brann, 2011; Pedersen, 2017; DSB, 2012).

The teams will first and foremost concentrate on search and rescue of passengers and crew, who may have been trapped by fire, smoke and fire gases. Firefighting can also be conducted by the MIRG teams, however any firefighting efforts come secondary to saving lives. Some MIRG teams are also specially trained and equipped to handle incidents involving hazardous and noxious substances. MIRG teams will cooperate closely with rescue helicopters (330

squadron), JRCCs, Coast Guard, RS (Redningsselskapet), cruise operators, and shipping companies. MIRG preparedness is further developed by training year-round together with these stakeholders and sometimes other countries' MIRG teams as well. A Nordic RITS forum has also been established to strengthen cooperation and preparedness in Nordic MIRG/RITS services including information exchange, and developing practical operations, training and exercises (Saltén Brann, 2011; Pedersen, 2017; DSB, 2012; Finnish Border Guard, 2014).

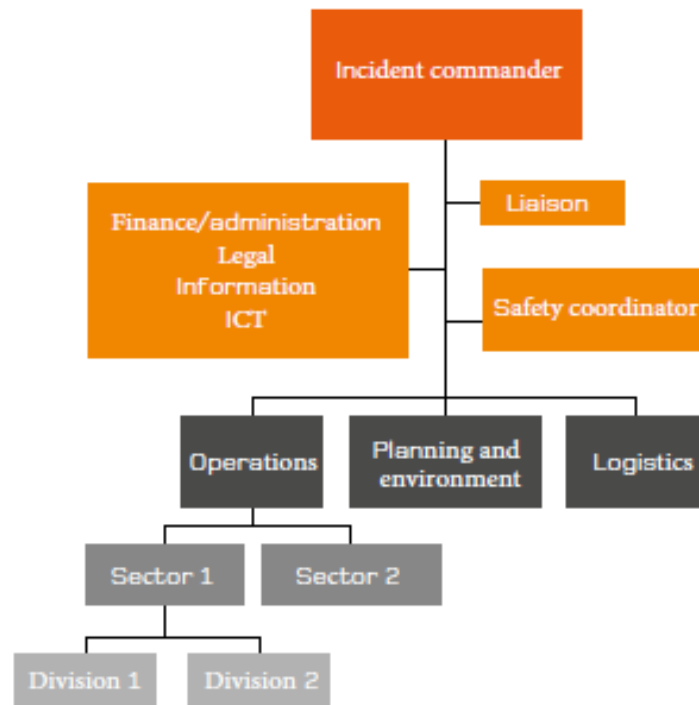
Coast Guard, Navy, and RS can take part in firefighting operations at sea with their crew and vessels that are equipped with fire pumps and nozzles to extinguish ship fires. In ship fires, it is often difficult to draw a clear line between maritime SAR efforts, firefighting and salvage. Maritime SAR efforts will concentrate on saving lives and is the responsibility of the JRCC, however the same resources can be used for firefighting and salvage after the SAR operation has finished. Towing a vessel to evacuate people will also be regarded a SAR operation, even though it recovers the vessel as well. Maritime SAR efforts continue until there is no longer any reasonable hope of rescuing people or the SMC has concluded the SAR operation. When the SAR operation has concluded, the leading responsibility changes from one organization to another. Salvage is the responsibility of the ship owner and often carried out by commercial companies. In case the vessel cannot be towed to port and there is still need for firefighting at sea after the SAR operation has finished, the operation will be led by the fire brigade together with the captain.

### 1.3.3 Operational hierarchy and management responsibilities

The Ministry of Justice and Public Security and DSB are responsible for the national level strategic management of the fire and rescue services in Norway. The Ministry in cooperation with DSB sets the legal framework for the fire and rescue services. DSB has several roles and responsibilities including being professional advisory to the Ministries, implementing adopted policies, managing and monitoring the law, managing its agencies and being a telecommunications operator by managing Nødnett. (DSB, 2018b; 2016) DSB also advises other government agencies, NGOs, businesses and the population.

DSB is also responsible for following up on conditions that affect society's preparedness, as well as for fostering knowledge and experience, and setting national norms for the sector. DSB develops and maintains guidelines for the national Incident Command System and Host Nation Support systems. DSB will also contribute to the necessary coordination and competence transfer between and with the users of Nødnett. DSB will make sure that Nødnett is actively used in daily operations and during crises, and that any organization with emergency response responsibility can use Nødnett (DSB, 2018b).

As previously mentioned, municipalities have the strategic and operational responsibility for establishing and arranging fire and rescue services within their municipality or region. The prevention and emergency preparedness departments and the fire chief are responsible for maintaining all strategic and operational plans of the municipal fire and rescue services. The fire chief should ensure adequate log and documentation of all efforts done. The fire chief will also have strategic responsibility with overall management of the services. (DSB, 2015)



**FIGURE 17. THE USUAL OPERATIONAL HIERARCHY IN NORWEGIAN ICS. (SOURCE: DSB, 2011)**

During operations, the incident commander will be in charge of the operational level coordination and command of an incident. Incident command in municipalities with more than 2000 inhabitants will be given to the watch team leader. The incident commander responsibilities include:

- Having an overview of the situation, planning and leading the operation, and strategic decision-making;
- Establishing communication with emergency alarm centres, emergency preparedness agencies, Coastal Administration etc.;
- Having an overview of responsibilities and tasks for all function in ICS;
- Actively inform the assisting authorities and other stakeholders of the strategy and plans;
- Clarifying and delegating authorizations;
- Conducting risk and situation assessment before tactical operations start;
- Assessing safety of the brigades and personnel;
- Establishing routines for regular information exchange (meetings);
- Approving action plans and orders;
- Ensuring appropriate and optimal use of resources and efforts;
- Conducting plans for transferring command and demobilization;
- Comments to the media about incident response in consultation with Information manager and other stakeholders such as police, municipality etc (DSB, 2011).

The Manager for operations has the responsibility to implement the action plan, which is approved by the incident commander. He manages and coordinates resources to carry out the operation, provides information and situational reports to the incident commander, and in

cooperation with the logistics manager makes an overview of resources that can be released. The Manager for operations prepares action orders and coordinates tactical efforts within available sectors and divisions. Sector leaders report to the operation's manager who reports forward to the incident commander (DSB, 2011; IMO and ICAO, 2016b).

The Manager for planning and environment helps to develop the action plan and orders, collects and evaluates information needed for decision-making, maintains situational overview, progress and resource status, and arranges changes in activities. The manager for planning and environment also develops environmental assessment, establishes and organizes the team, calls upon external professional expertise if needed, establishes contact with other functions in the response organization, gets regular situation reports and strategy, and maintains documentation (DSB, 2011; IMO and ICAO, 2016b).

The Manager for logistics is responsible for the logistics of operations and helps to provide resources and services according to action plan or order. These include arranging personnel, transportation, supplies, facilities and equipment. The manager for logistics cooperates closely with the manager of operations. The manager of logistics maintains an overview of available and used resources including when they are no longer needed, participates in preparing of the action plan, identifies the demand for resources, and develops an evacuation plan for response personnel and resources. The Civil Defense can also take over the logistics function as they have the capacity and competence to lead logistics and report directly to the incident commander (DSB, 2011; IMO and ICAO, 2016b).

The Manager for finance and administration leads and organizes staff to coordinate finance and administration tasks, including assisting with monitoring costs, providing accounting and procurements, keeping time records, doing cost-analysis, cooperation agreements, contracts, equipment rental agreements, and other administrative matters (DSB, 2011; IMO and ICAO, 2016b).

The Manager for information assists with media and others seeking information from the incident, holds the updated information about the operation, ensures that the incident commander has appropriate information available, contributes to the development of information and press-releases to media, helps to provide information to the public and families of persons in distress, organizes press conferences, coordinates information with other organizations, establishes routines for log, documentation and archiving (DSB, 2011; IMO and ICAO, 2016b).

The Security coordinator monitors safety conditions, develops measures to ensure safety and reduce risks, organizes and evaluates safety procedures, provides input about safety and security measures for the action plan, follows up any deviations and reports to the incident commander (DSB, 2011).

A Legal function is established as part of the organization when there is a need to handle legal tasks. This may be related to exercise of authority, assessing legal basis, decisions on measures, execution of decisions and other formal documents, assessment of liability and insurance conditions, monitoring actions and arranging meetings on legal matters with

external representatives if necessary. The manager for legal matters can assist with specific questions about procurement rules and contracts (DSB, 2011).

ICT support includes technical assistance in connection with use of ICT equipment such as PC, printers, projectors, networks, connectivity and access to professional applications. This function can help to ensure that necessary material is available and that the technical tools work. ICT support can give general user support and advice as needed (DSB, 2011).

If necessary, for the incident, a liaison function can be established or external advisors called to provide their assistance and expertise. Liaison officer serves as a contact and a channel of information back to their respective organization. Depending on the circumstances, liaison can be placed to assist with any of the functions. The liaison will provide information and help with the organization's resources, opportunities and any legal issues that may be clarified. It may also be useful to obtain external advisors or relevant professionals who can contribute to the incident within their expertise. Relevant professionals can come from, for example; Police, Civil Defense, Armed Forces, DSB, County Governor, municipalities, forestry authorities, forest owners, voluntary organizations, Norwegian Maritime Directorate, Directorate for nature management, and Norwegian Polar Institute (DSB, 2011).

In major incidents involving various authorities, the police incident commander can establish an on-scene command centre which includes sectoral incident commanders from the fire brigade and paramedics/ambulance services. The incident commander from the fire services is responsible for the firefighting task and the technical aspect of a rescue operation. The incident commander from the local health services is responsible for the medical tasks of the operation. The incident commander police are responsible for the overall coordination, running the incident command centre, and law enforcement tasks (DSB, 2011; IMO and ICAO, 2016).

### **Firefighting and SAR operations at sea**

Firefighting operations in SAR incidents at sea are tactical level operations and conducted by the vessel's own crew, the MIRG teams and other smoke divers from, for example, the Coast Guard. The operational level hierarchy of SAR and MIRG operations at sea will follow the IAMSAR structure (*see chapter 1.1.3*) and are led by the JRCCs. MIRG operations does not have an official incident commander from the fire and rescue services. However, the fire chief has an operational level responsibility to act as a liaison officer at the JRCC (Saltén Brann, 2011; Pedersen, 2017; DSB, 2012).

The master of the distress vessel is in charge of any operation on board his/her vessel during SAR operations, including MIRG operations. The master of the vessel will direct his/her crew with firefighting operations and also give commands and advice to the MIRG operation commander. The master will also be in contact with the ship owner, SAR mission coordinator (SMC) at JRCC and the SAR mission on-scene coordinator (OSC). The success of the MIRG operations rely on effective cooperation between the MIRG teams and the distress vessel crew. The shipping company or the ship owner is responsible for the vessel's fire safety, firefighting and evacuation plans, and required to train the crew to start firefighting measures and assist the external firefighting teams. Similar to any emergency situation, if a fire on board



a vessel can be tamed by the vessel crew and danger to the crew and passengers is small, the ship owner is responsible for coordination without external support. The ship owner's response team should, however, alert relevant authorities, including the JRCC, about the fire. The ship owner can request some assistance such as advice, but the overall coordination is handled by the ship owner while the situation is under control. If the emergency evolves to the point where the ship owner and the ship crew cannot handle the fire, the coordination will be passed to the JRCC and the MIRG crew will be alerted if necessary. The ship owner's emergency response staff has its own operational structure and is normally led by a preparedness team leader. The owner company may send a liaison to the JRCC during the SAR part of the operation. SMC and OSC responsibilities will remain the same as in any SAR incident. The MIRG operation commander acts under the authority of the SMC and is responsible for reporting both to the SMC and the OSC (Saltén Brann, 2011; Pedersen, 2017; DSB, 2012; Finnish Border Guard, 2014; 2016).

Although, the master of the vessel is in charge of the operations on board his/her vessel, the MIRG operation commander is responsible for the tactical management of the MIRG operation and leading and coordinating his/her team from the bridge. The MIRG operation commander decides on tactical and operational actions required to stabilise and contain the incident on board the vessel, in consultation with the master of the vessel. (DSB, 2012; Finnish Border Guard, 2016) Figure 18, explains the tactical level hierarchy of a MIRG operation and team in Norway.

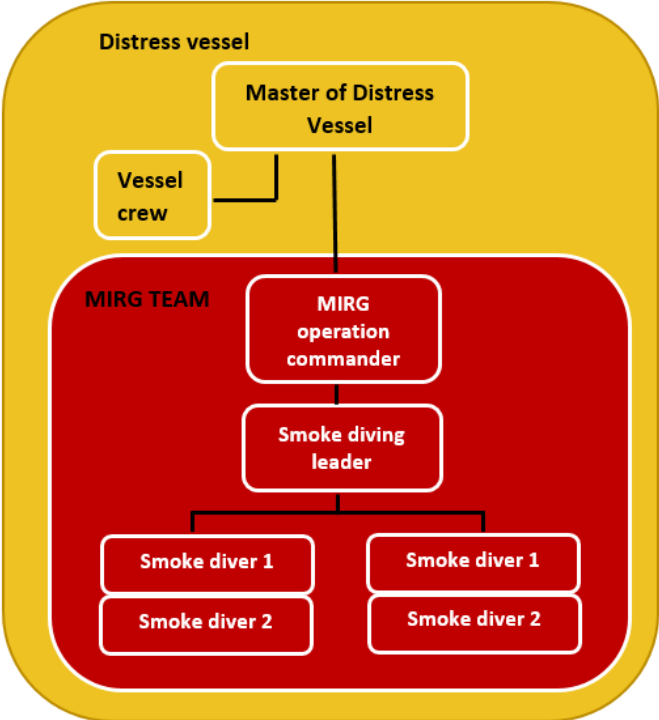


FIGURE 18. MIRG OPERATIONAL HIERARCHY IN NORWAY. (SOURCE: SALTEN BRANN, 2011; FINNISH BORDER GUARD, 2016)

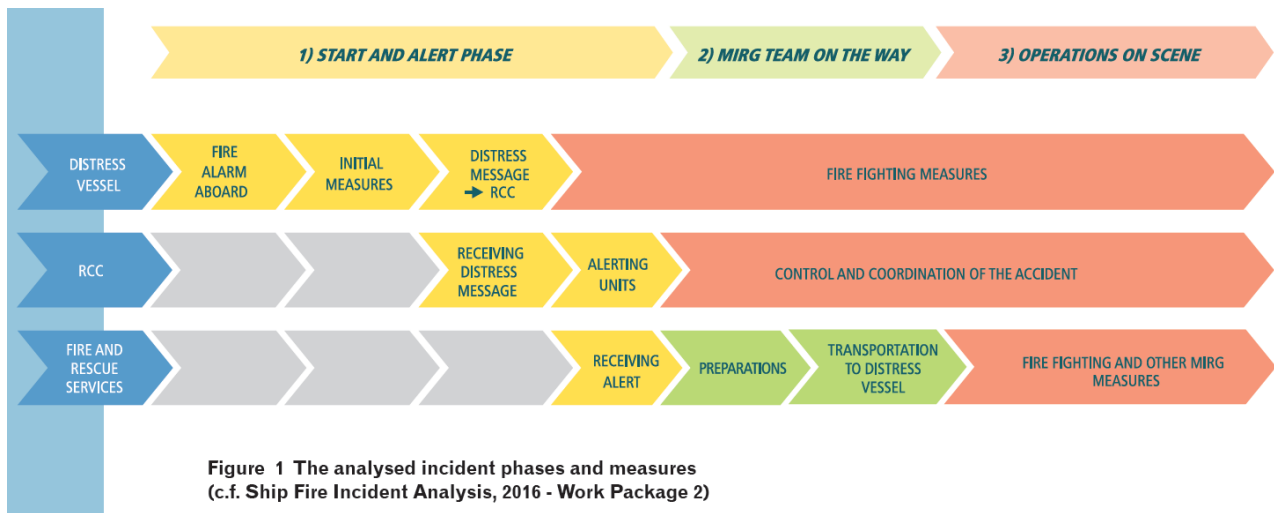
The operation commander has to ensure that the JRCC and the master of the distress vessel are informed of the MIRG team's actions. In international MIRG operations or when there are more than one team involved from Norway, the leader of the first MIRG team to arrive on board will take the role of a MIRG operation commander who leads all MIRG teams. The MIRG operation commander is responsible for assembling and keeping track of the MIRG team and assigning responsibility areas and tasks to the smoke diving leader and his/her teams. The MIRG operation commander works closely with the master of the vessel and acts as an advisor and support to the master in fire and rescue, and chemical incidents. The MIRG operation commander will also carry out risk assessments, observe and evaluate the situation, provide a tactical plan including equipment and resource requirements, give orders to the MIRG crew, produce SITREPs to the JRCC and other authorities, report of any events that will affect the situation, and continuously map and plan retreat options for the MIRG team. He/she is also responsible for the occupational safety of the team during operations (Saltén Brann, 2011; Pedersen, 2017; DSB, 2012; Finnish Border Guard, 2014; 2016).

Smoke diving leader leads the tactical smoke diving efforts during MIRG operations. When entering the ship, the smoke diving leaders joins the MIRG operation commander and the captain on the bridge to determine the tactical plan and basepoints with the operation commander. The smoke diving leader makes sure that the smoke diver teams understand the plan and orders, checks equipment and provides assistance with the hose outlet to the smoke divers, keeps log of the efforts, observes safety of the operation, and secures retreat paths for the smoke divers (Saltén Brann, 2011; DSB, 2012).

Smoke divers take orders from the smoke diving leader and conduct the smoke diving, chemical diving, search, rescue and evacuation of people. The smoke divers work in pairs. Smoke divers shall, if possible, utilize and work together with crew members familiar with the vessel or smoke divers from the vessel, during their operations. Smoke divers can also assist the crew with evacuation and perform firefighting tasks after the SAR operation is ended (Saltén Brann, 2011).

#### 1.3.4 Plans and standard procedures presenting the main action patterns

Municipalities in Norway are responsible for developing contingency plans, action plans, and procedures for their firefighting operations. The ministry has set the fire and explosion protection act and DSB has set guidance papers for fire prevention and organisation of fire and rescue services in general. DSB has also set a guidance paper for smoke and chemical diving. (DSB, 2015) The MIRG operations will also follow the municipal plans, the fire station's smoke and chemical diving plans and the fire and explosion protection act and other guidance papers and plans on employee safety (Saltén Brann, 2011). Figure 19 illustrates a basic action pattern for coordinating firefighting measures at sea. The figure presents international operating procedures developed by the Finnish Border Guard for their Baltic Sea MIRG project (2016).



**FIGURE 19. MAIN ACTION PATTERN FOR COORDINATING FIREFIGHTING MEASURES DURING AN INCIDENT (SOURCE: BALTIC SEA MIRG OPERATIONAL GUIDELINES, FINNISH BORDER GUARD)**

Before MIRG operations start, the distress vessel crew will start initial measures after a fire alarm aboard a vessel goes off, in case of an explosion or if smoke is detected. The distress vessel will send a distress message to the coastal radio or the joint rescue coordination centre (JRCC). The captain of the vessel will also be in contact with the ship owner. The crew will continue the firefighting measures on-board. The RCC will receive the distress message from the vessel and depending on the urgency of the situation will declare an appropriate emergency phase and alert required units. If the crew cannot handle the fire and request external assistance, the RCC will alert relevant MIRG teams. The SMC at the JRCC will appoint an on-scene coordinator if needed and assume the overall control and coordination of the incident. The fire and rescue services will be alerted by the JRCC. If the request for assistance to a vessel is received from another source, the fire department shall immediately notify the relevant JRCC of this. The relevant fire department will start preparations for their MIRG team and the JRCC will arrange transportation for the MIRG team to the distress vessel. Meanwhile, the crew will continue the firefighting measures, and evacuation if needed. Once aboard the vessel, the MIRG team will start firefighting and other MIRG measures led by the MIRG operation commander in cooperation with the captain (Salten Brann, 2011; Finnish Border Guard, 2016).

For international assistance of MIRG teams and firefighting at sea, the JRCC will follow the usual SAR procedures of seeking assistance from other countries. The JRCC will contact the neighbouring RCCs if foreign MIRG teams are needed in an operation (JRCC SN and NN, 2017). The JRCCs in Norway require a simple clearance for the foreign rescue units that are sent to Norway for assisting in SAR missions. Any military units will have different procedures with cross-border assistance. Coordination for the flight information region, in case foreign MIRG teams are transported by helicopter, the coordination of routes will be handled by the ATC. Most countries have national procedures for receiving and sending units to/from other countries (JRCC NN, 2017).

### 1.3.5 Reflections on the operational patterns of firefighting at sea

Vessel fires are always challenging due to long distances, a compact set of decks and corridors, difficult escape routes and with cargo and/or passengers that may cause extra challenges. The Arctic environment poses an extra challenge for emergency response. This also includes firefighting operations. Ships fires often spread fast and firefighting efforts can last for a long time. Major ship fires or explosions can have significant consequences for both people and the environment, especially in the Arctic where response is challenged by resource scarcity, long distances, difficult weather conditions and poor communication capacities. Particular attention also has to be paid to the demands that the Arctic environment pose to the firefighters' equipment, operations, training, and safety. Rough seas, cold conditions and quickly changing weather in the Arctic also set limitations to the equipment and utilizing MIRC teams. The smoke divers may face difficulties both in launching at the ship and to operate in heavy seas. The fire chief therefore has a burdensome responsibility in deciding whether to send out MIRC teams to an incident site. As there is a lot of traffic on the coastal areas of Northern Norway, having MIRC teams in the North is a major asset to the SAR system.

Some of the key challenges that MIRC operations might face are chain of command issues in large-scale and multinational operations, where various MIRC teams or international crew is involved. Also, the captain still has the main authority on board. The MIRC operation commander has a major responsibility in communication from the bridge to various different directions and coordinating multiple teams from different fire-stations and jurisdictions. He/she must also assess the situation, identify the outcomes and escalation of the incident, evaluate resource needs, and upscale quickly if the incident evolves into a large-scale operation. With MIRC operations, decision-making is very crucial with regards to the safety of the MIRC team and their retreat plan in case the fire cannot be controlled. MIRC teams must be specially trained for these scenarios. MIRC teams also face a coordination challenge with the crew of the vessel as they are an important asset in SAR and firefighting operations, however often come from multiple countries and cultures.

Since MIRC operations are part of the SAR system, MIRC procedures and the chain of command is fairly straightforward, unless the situation calls for several teams from other countries, which would pose challenges in understanding the leadership between various teams, their organizational cultures, structure and procedures. Although MIRC operations fall under the SAR system, parts of ICS will be established at the fire brigade by the fire chief to support logistics and information functions, decision-making and creating situational awareness during the incident. Because the MIRC teams must know both the ICS system for their daily fire and rescue service operations and also the maritime SAR system for MIRC operations, education and competence building in both of these areas is very important. In order to fully understand the chain of command, the MIRC teams, especially the operation commander, should be familiar with the SAR system in addition to the ICS. Training with foreign MIRC teams and familiarizing with their SAR system, firefighting procedures, and communication and coordination systems is essential in order to achieve efficient coordination in multinational operations. Especially for the MIRC teams in Northern Norway, it would be beneficial to train with Russian and Icelandic fire and rescue services, considering that their systems are different to Norway's and joint operations in Barents and Norwegian

seas are quite possible. For land-based operations, the Exercise Barents Rescue every second year provides an opportunity to train with Swedish, Finnish and Russian forces.

Possible challenges with communication, both technical and coordination, exist in all levels of the command chain in MIRG operations. Conclusions from Skagex11 exercise (2011) stated that situational reports (SITREPS) from the smoke divers and smoke diving leader to the bridge and vice-versa were not sufficient, which affected coordination and the creation of a situational picture at the bridge and within the JRCC. For this to function well, communication from the MIRG team to the operation commander and the captain, as well as to the on-scene coordinator and SMC should be fluent and timely. If one link is not working, it effects the whole chain of command and overall situational awareness of the operation. In an international MIRG exercise in Turku, Finland, SITREPS from the MIRG operation commander and captain to the MRCC and fire liaison officer was delayed in reaching the assisting foreign JRCC, and therefore the assisting SMC forwarded different messages to its own MIRG team than the ones they were receiving from the distress vessel. Good communication with the captain and MIRG operation commander is also crucial and can be hampered by different language, terminology, culture, and opinions. The MIRG operation commander is in the centre of all communication and therefore must have excellent coordination and leadership skills.

On an operational or strategic level, the JRCC and the fire chief or another liaison officer will play the main role. The fire chief will always have the final word on whether to send a MIRG team to an operation, and therefore cooperation and communication between the JRCC and the fire chief has to flow well. In order to increase the fluency of operational management in MIRG operations, the Baltic Sea MIRG standard operating procedure suggests utilizing a fire liaison officer (FLO) at the RCC, who will maintain contact and receive situational reports from the MIRG operation commander at the vessel. The task of the FLO is to facilitate cooperation between the JRCC and MIRG teams by relaying necessary information between them. In addition, the FLO assists the JRCC in collecting situational information related to the MIRG operation and maintaining situational awareness. The FLO will work under the SMC and supports the SMC in operational coordination. Using a FLO will give the SMC more time to focus on the overall SAR management and coordination (Finnish Border Guard, 2016).

In Norway, JRCC can call a liaison from the fire and rescue services to the JRCC for giving advice on the firefighting tasks. The liaison is not formally called a FLO and there are no standards operating procedure in Norway for the use of FLO. However, the tasks are similar. Utilizing a FLO also helps with forwarding strategic and sector specific knowledge related to the incident. Harmonizing procedures, terminology and education with the neighboring countries would lead to more efficient and clarified coordination in multinational situations. Therefore, strategic level engagement with agencies in both Norway and abroad is important for developing a proper understanding and exchange knowledge.

Joint procedures for Norway's MIRG teams as well as Nordic countries could also be developed further, for example with systematic sharing of SAR knowledge and skills, requesting assistance and further resources in large-scale incidents, and establishing working communications with each other. Practical cooperation could also be further activated by arranging more tabletop and simulation exercises with the MIRG teams. For Northern Norway,

this would be of relevance especially with Russian and Icelandic fire and rescue services that may work together in large scale operations in the Barents Sea and the Norwegian Sea.

## 1.4 Violent action situation and counterterrorism

### 1.4.1 Main institutions in the preparedness value chain

When unexpected events, crises and terrorist attacks occur, the public will expect the police to protect the citizens, create safety and have capabilities to solve social tasks as defined in the Police Act § 1 where the second paragraph describe the police`s mandate as well as the main task:

*The police must through prevention, enforcement and assistance be part of the community's collective efforts to promote and consolidate rule of law, security and general welfare otherwise.*

In the daily work, the police are organized hierarchically in line management. In case of extraordinary events or crises the police will be organized by a management structure that enables law enforcement agencies to deal with the situation. This is defined as the incident management (IM) staff. IM staff is viewed to be able to effectively coordinate and manage the resources that a police district has. However, it will depend on the district`s resources whether the Police District establishes the IM staff or not. Some districts will have a higher threshold for setting IM staff than others. The main task of the IM staff is to assist the District Chief of Police (DCP) in management through decision support, implementation of measures and following up the measures (The National Police Directorate, 2011, p. 118). When extraordinary events or emergencies occur, the established IM staff will act under the authority of the DCP. The IM staff is a temporary organization linked to a particular incident. When the incident or situation is clarified, the police district returns to ordinary line of management.

### **The Coast Guard`s execution of the police authority**

According to the § 11 of the Instruction of Coast Guard FOR-1999-11-05-1145 and the Coast Guard Law nr. 42 from 1997, the Coast Guard may provide assistance to the police, including the prevention and combating of crimes and illegal acts against persons, vessels or permanent establishments.

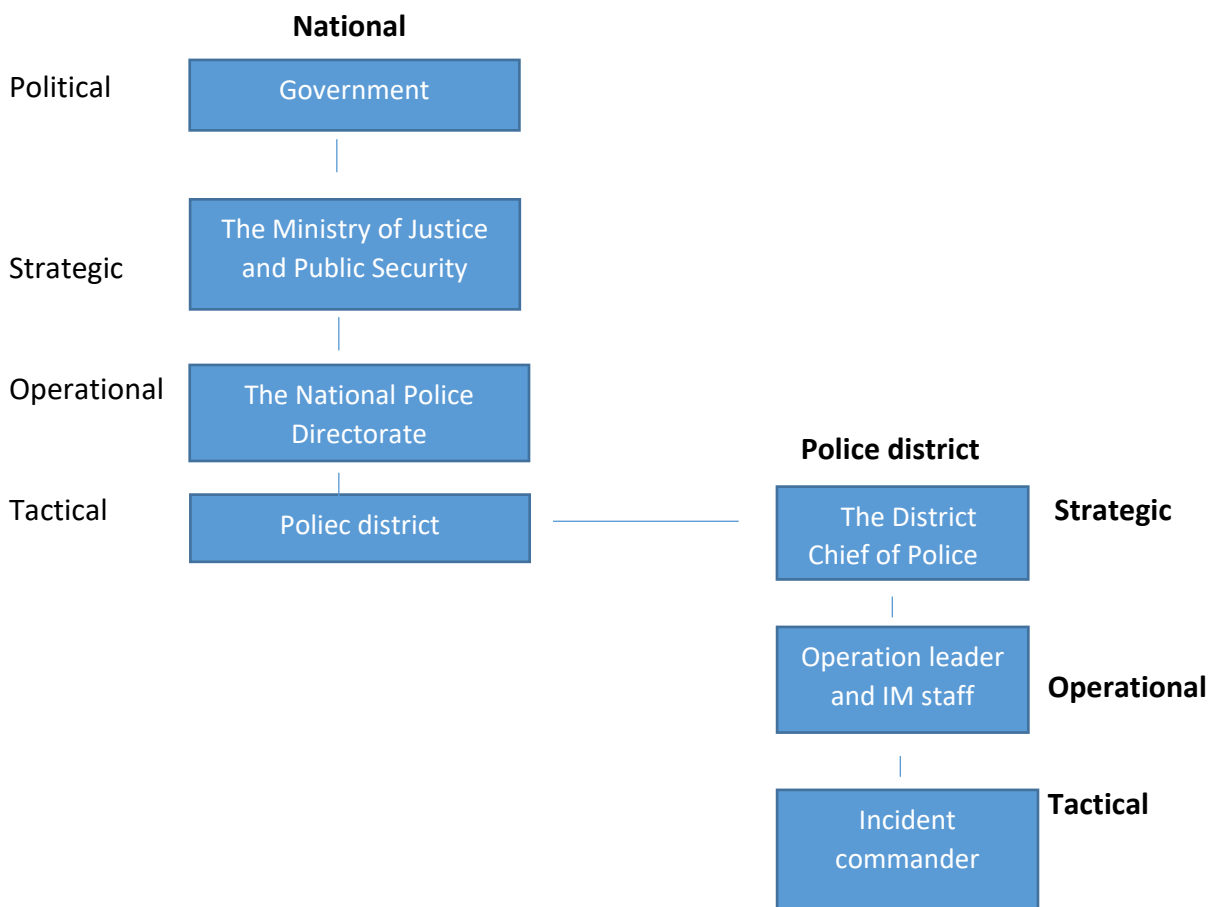
The Coast Guard can execute the police authority in accordance with police`s instructions and appropriate guidelines. In addition, the Norwegian Ministry of Defense authorizes further provisions regarding the Coast Guard's exercise of police authority.

In matters relating to continental shelf operations, the Coast Guard acts under the relevant police officer or designated police officer during the execution of their limited police authority. Within the territorial boundaries of Svalbard, the Coast Guard can execute their legal limited police authority in accordance with directives of the Governor of Svalbard.

## 1.4.2 The organizational model, command system and external relations

According to PBS1, guidelines for the police preparedness, the Norwegian preparedness management involves four levels of national emergency response (The National Police Directorate, 2011, p. 30):

- political level includes the government;
- strategic level includes ministries/departments;
- operational level includes the national Police directorate (and Joint Rescue Coordination Center and police security service);
- tactical level includes police districts and other special forces.



**FIGURE 20. MANAGEMENT LEVELS IN THE NATIONAL PREPAREDNESS SYSTEM**

The Government is the supreme political body in the emergency preparedness system. There is a system for rapid notification of the government in case of incidents. The Government Security Committee (Regjeringens sikkerhetsutvalg: RSU) deals with matters related to defense and security policy. The committee normally includes the Prime Minister, Minister for Foreign Affairs, Minister of Defense, Minister of Justice and Public Security and Minister of Finance. The Prime Minister's office is the secretariat of the committee.

The ministries constitute the strategic level. Every ministry shall prepare plans and practice for dealing with crises within their own area of responsibility. When it is needed to strengthen

coordination between the involved ministries, the Government’s crisis council (Regjeringens kriseråd: RKR) is called upon. If not, another ministry is assigned the main leading responsibility, then the Ministry of Justice and Public Security shall lead the crisis incident response. The role of RKR is to provide the strategic coordination in complex crises. The crisis council’s work involves assessing questions about management department, ensuring good coordination of efforts, and ensuring coordination of information to the media, public and other actors. The Government’s crisis support unit (Regjeringens krisestøtteenhet: KSE) is an administrative resource within the Ministry of Justice and Public security serving the ministries and the RKR in case of a crisis situation.

The Police Directorate constitutes the national operational level. The Police Directorate’s Situation Center may coordinate resource allocation if an incident affects more than one police districts. They can appoint a leading police district if an operation affects several police districts. The Police Directorate advises the involved chiefs of police and heads of agencies and ensure the availability of the personnel and material resources.

The national tactical level is the level of police districts. The police have significant responsibilities when it comes to the local emergency preparedness and must cooperate with the emergency preparedness agencies such as JRCC, the municipality, the Armed Forces, local businesses, volunteer organizations and the general public.

The Police is organized at three levels at the district level. IM staff is characterized by task- and result oriented leadership, and the staff is given wide authority when it comes to deploying resources. The organizational design of the command system in critical incidents is illustrated as follows:

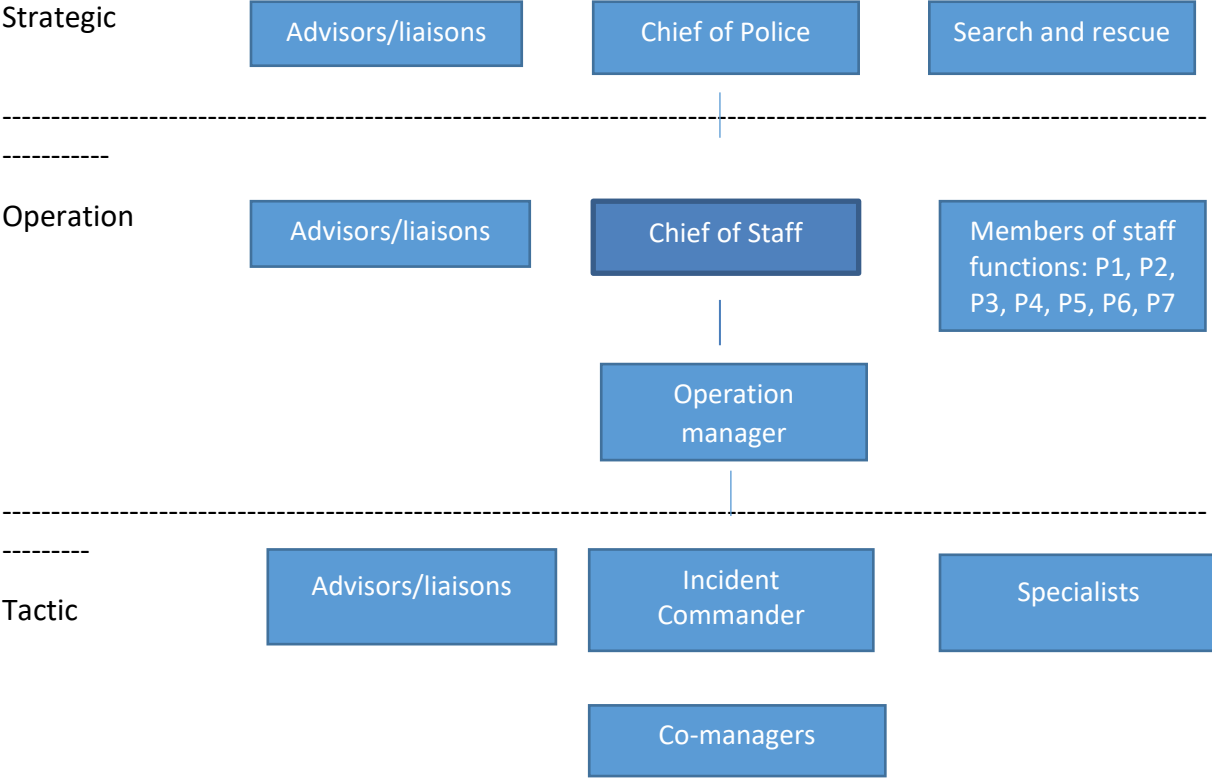


FIGURE 21. MANAGEMENT LEVELS IN POLICE DISTRICTS



Management levels represent the division between different tasks and decision making levels, but these separations are not sharp defined. The chief of police must be able to make both operational and tactical level decisions when necessary. The staff must also be able to make both strategic and tactical level decisions. In case of an unwanted and/ or extraordinary event or crisis, the police must quickly be able to gather and organize their resources to carry out any efforts depending on the situation. The chief of police decides whether the incident requires the IM staff to be established. The Operation Center is the police district's management and coordination center, and it forms a platform for the operational work of the police. The Operation Center is an important coordinating unit in the police district and serves as an operational management level platform also for rescue sub-coordination centers (RSC, in Norwegian: LRS) in search and rescue response operations. When the Chief of Police establishes the IM staff, the operation manager is responsible for communication and coordination with an Incident Commander.

The police cooperate with various authorities and organizations. Depending on the incident type, the police cooperates, among others, with: Acute medical services, the Norwegian Labor Inspection Authority, Avinor, the Norwegian Church, Norwegian Directorate for Civil Protection (DSB), the Armed Forces, including Norwegian Joint Headquarters, the Coast Guard, the Norwegian Home Guard, Border Guard (Garnison GSV), the Norwegian Special Operations Command and other special military forces. Other organizations include volunteer organizations, County Governors, Joint Rescue Coordination Centres and Rescue Sub-Coordination Centres, Norwegian Directorate of Health, Norwegian Industrial Safety Organisation, Norwegian Environment Agency (Klif) and the municipalities, including Municipal Health services, Fire Brigades and 110-emergency center, Norwegian Coastal Administration, Civil Aviation Authority, Norwegian Food Safety Authority, Norwegian Institute of Public Health, Norwegian Geotechnical Institute, The Norwegian Water Resources and Energy Directorate, Norwegian Broadcasting Corporation (NRK), Norwegian Society for Sea Rescue, Petroleum Safety Authority (Ptil), Civil Defense, Accident Investigation Board Norway, Norwegian Radiation Protection Authority, Norwegian Public Roads Administration, and Ministry of Foreign Affairs of Norway.

#### 1.4.3 Operational hierarchy and management responsibilities

The regional strategic level is responsible for developing a strategy that describes how the police action should be conducted. The strategic level is separated from the operational level, because strategic thinking requires a certain distance to the incident. During police action, the strategical level is therefore located in another room from the operational level coordination. However, the IM staff management requires a close and trustworthy relationship between the DCP and the IM staff (POD, 2011, p. 120).

When the chief of police decides to establish the IM staff, it must be clear to all involved that they need to shift from ordinary line management to the IM staff management structure. The chief of police can establish a strategic group together with managers and specialists (advisors and liaisons). (ibid, p.121).

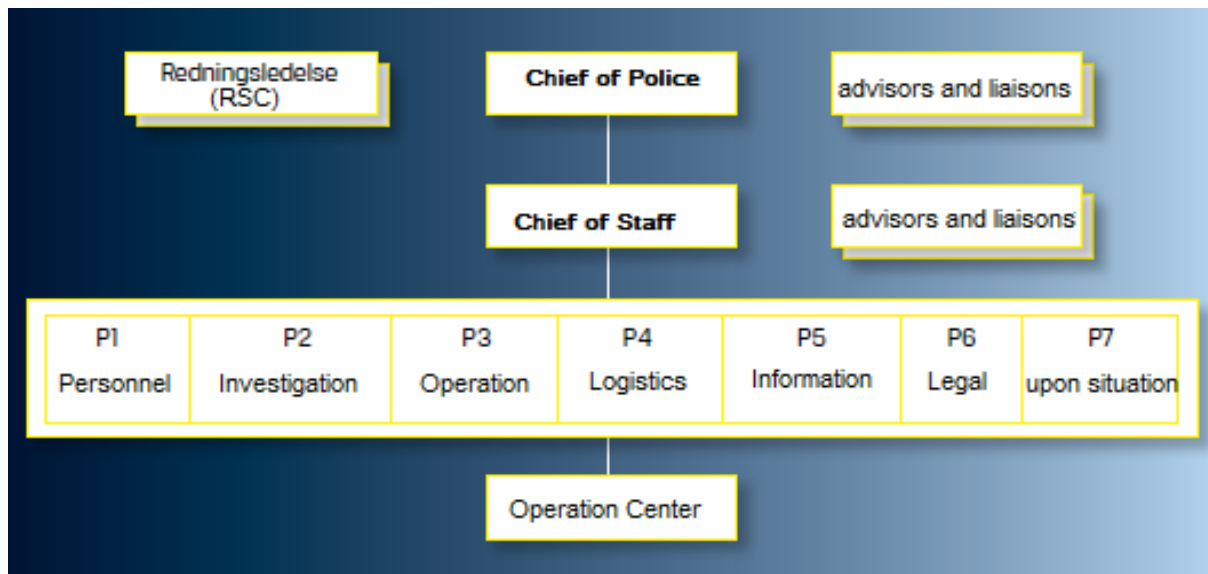


FIGURE 22. THE NORWEGIAN POLICE COMMAND SYSTEM

The incident command system of the IM staff management has seven different functions with defined roles and responsibilities, including chief of staff, advisors and liaisons:

P1<sup>4</sup>: Personnel

P2: Investigation and intelligence

P3: Operation

P4: Logistics

P5: Information and media

P6: Legal

P7: Function depending on situation

When IM staff is organized, the top-leader on the operational level is the Chief of Staff.

### The Chief of Staff:

The Chief of Staff manages and coordinates the work of the IM staff. As figure 2 illustrates, the Chief of Staff is linking interaction between the Chief of Police and the Operation Manager.

During an emergency, the *main responsibilities* of the Chief of Staff are:

- Report on the situation to the DCP
- Elaborate on plans in progress to the DCP
- Advise the DCP in decision-making process
- Make situational reports on behalf of the DCP
- Present directives and framework
- Inform the staff about the DCP strategic constraints and decisions, and make sure these are followed up

<sup>4</sup> Letters and numbers are used to describe the staffs. The number refers to the functional area (*funksjonsområde*), and the letter refers to which hierarchical level or institution the staff belongs to (POD, 2011, s. 123)

During the Planning phase, the role of Chief of Staff is to:

- Ensure the staff is set according to staff instructions and the DCP's order
- Make sure that the other managers know their tasks and responsibilities
- Assess the task with the staff and eventually advisors, and present it to the DCP
- Coordinate planning by having continuous contact with the staff members
- Continuously assess and analyze the situation
- Establish best practices for situation reports from the other managers, especially with operations manager and incident commander
- Write situation reports to the DCP
- Ensure that staff prepares operational plans and any other plans or measures
- Verify that the staff's planning is adequate
- Cooperate with the DCP, the staff, operation manager, and incident commander on the media strategy
- Providing a routine for registering the staff log
- Provide a routine for staff meetings
- Ensure that the focus board is used

During the Implementation phase, the chief of staff should:

- Draw up guidelines for the operation in consultation with the DCP and P3. These guidelines form the basis for the staff's planning in general and especially for P3 planning
- Coordinate the staff's planning, control the plan and submit it to the DCP
- Assure and control the plans of incident commander
- Implement the approved operational plan or other plans and give orders to the incident commander. If time permits, present the order at order meetings
- Ensure that implemented operations are in accordance with the order
- Ensure that the liaison and staff advisors have satisfactory working conditions
- Cooperate with the DCP, P3, P5 and incident commander about managing the media
- Ensure that there is a plan for day-to-day operation of staff
- Keep a tactical debrief after the operation
- Ensure the operation is being evaluated

### **Managers of the IM staff functions**

The dimensioning of the staff depends on the extent and complexity of the event, as well as on the staff competence and experience. Functions can be combined or divided. In some situations, the same person can perform more functions, while larger complex events require more people in each function.

All staff functions should be led by their respective managers. Their deputies must also have necessary competence in their own field and knowledge of other staff functions. It is particularly demanding to ensure work of staff over long period of time. Daily operation routines must be planned at an early stage. The managers are responsible for that the actions within their area of expertise are consistent with the chief of the staff's orders. The managers for IM staff functions should be recruited on the basis of qualifications and personal suitability, with corresponding professional responsibility for daily operations.

In addition to leading and organizing the actions within their own function, the main tasks of the IM staff function managers are to:

- Gather and process information
- Assess the situation on an ongoing basis
- Submit recommendations to the Chief of Staff or DCP
- Projecting decisions and plans in orders
- Controlling, guiding and orienting

Other staff personnel perform routine tasks according to directions as well as other tasks assigned by the managers. Each function should coordinate its activities with all other functions and their staff.

### **P1 Personnel**

P1 works closely with P4 (logistics) concerning the use of resources and HR. P1 should also have an overview of the police staff and personnel from other organizations cooperating with the police.

Main responsibilities:

- Personnel
- Economy
- Administration

Main tasks in the check list:

- summon the staff and crew operation center
- have an overview of the incident command staff and other members of staff
- have an overview of the staff competence
- have procedures for handling personnel and compensations
- call upon own and external personnel
- prepare to host personnel
- initiate orders
- organize personnel in cooperation with P3 (operation)
- establish a contact point if using external personnel
- make sure that actions are in accordance with the staff manual and safety handbook
- obtain situation reports on personnel status
- evaluate the financial consequences of the planned measures
- prepare personnel lists, service lists and calculate travel expenses, overtime etc.

### **P2 Intelligence**

P2 participates in planning and works closely with P3. When needed the P2 function is reinforced with personnel from the Norwegian Police Security Service (PST). P2 cooperates with P5 (information) to obtain intelligence information through media monitoring.

The police shall investigate possible criminal threats in connection with an incident. The investigation may have a direct impact to resolving the acute situation. All investigations during an extraordinary incident must be coordinated by P2.

Main responsibilities:

- Intelligence
- Analysis
- Coordination of investigation
- Norwegian Police Security Service (PST)
- Overview of evacuated
- Connection to next of kin

The main tasks in the check list are:

- Obtain information about all issues important for planning
- Initiate research
- Norwegian Police Security Service (PST): Based on analysis and threat assessments, prepare proposals for object watch, personal security, escort security, internal security measures etc. in collaboration with P3
- Situation assessment and analysis of information (including information obtained by P5)
- Threat assessment
- Establishment and operation of the reception center
- Establishment and operation of the evacuation center
- Establishment and operation of next-of-kin center
- Establishment and operation of the telephone line for next-of-kin
- Establishment and operation of the registration center
- Crisis and hostage negotiators, in collaboration with P3
- Prepare overview of evacuated, injured, dead, arrested, witnesses, etc.
- Keep an intelligence board and intelligence map

### **P3 Operation**

P3 has a central function in the staff's planning. The primary responsibilities of P3 are operational activities and preparing plans. P3 works closely with P2, as well as with the operation manager and the incident commander concerning planning. P3 coordinates and controls the execution of the operation.

Main responsibilities:

- Operational planning and coordination
- Negotiations in cooperation with P2

Main tasks in the check list:

- Obtain situation reports
- Obtain intelligence information from P2 and P5
- Situation assessment together with the Chief of Police and the Chief of Staff
- Prepare operation plan
- Draw up plans for object defense
- Personal protection, escort security, internal security measures etc.
- Provide notification orders, operation orders or other orders in consultation with the Chief of Staff
- Assess the need for personnel and material
- Allocate resources

- Collaborate with the incident commander about the planning
- Collaborate with the operation manager on planning and implementation
- Collaborate with the Chief of Police, the staff members, the operation manager, and incident commander on media strategy
- Crisis and hostage negotiations
- Assess the capacity and competence of the staff
- Assess the need for supporting resources
- Facilitate training on a specific task
- Keep/update situational board and situational map
- Make sure that the actions are taken in accordance with the operation order
- Make sure that the performance is in accordance with relevant regulations (in consultation with P6), the decisions of the chief of police and the current operation orders.

#### **P4 Logistics**

P4 participates in the planning process and works closely with P1 regarding resource support for the operation. P4 sets up a logistics plan, guides, coordinates and controls the logistics service. P4 is responsible for the equipment in the staff room (office equipment, maps, computer equipment, etc).

Main responsibility:

- Materials and communication resources
- Sanitary (medical support)
- Transportation
- Provision
- Quartering

Main tasks in the check list:

- Assess resource demand
- Ensure required transportation
- Ensure required materials
- Provision and quartering
- Ensure connection and IT
- Prepare a logistics plan
- Routines for issuing materials
- Have an overview of resources

#### **P5 Information**

P5 participates in the planning process and is responsible internal and external communication. P5 will support DCP, staff, and incident commander on issues regarding media management. P5 assists P2 by obtaining intelligence information through monitoring the media.

Main responsibilities:

- Media management
- Internal information
- Media monitoring

Main tasks in the check list:

- Provide communication advice at all levels (strategic, operational, tactical)
- Prepare and publish approved information for the public and the media
- Publish information within own organization
- Ensure media monitoring
- Establish necessary capacity to respond upon media requests
- Prepare messages (points for speeches) for the representative speaking to the media
- Facilitating messages, arranging press conferences and establishing a press center
- Ensuring communication with the National Police Directorate

## **P6 Legal**

P6 participates in the planning process with legal opinions and recommendations.

Main responsibilities:

- Contributing to legal control during planning and preparations
- Obtaining relevant regulations and other legal basis
- Clarifying legal issues relevant for the staff's work during particular events
- Preparing "pattern scenarios " with brief description of authorizations and problems
- Upon request, participating in describing work routines and task lists
- Upon request, participating in the planning, evaluation and other meetings
- Contributing to good quality in documents (such as requests for assistance) to other authorities and partners

Main tasks from the check list:

- Provide access to relevant regulations and other information, etc.
- Assist the chief of staff in clarifying the important legal issues, which are expected to occur or have occurred
- Assist other staff functions when needed
- Help the attorney's lawyer to get sufficient knowledge of the situation

## **P7**

This function is manned by the police, if needed for a specific incident.

## **Advisors**

The staff can call upon advisors when needed, both from the police and the external organizations. The staff may call upon, for example the following expertise:

- emergency unit (UEH)
- emergency squad
- crisis and hostage negotiators
- advisory group of psychologists and psychiatrists
- police dog service
- police helicopter
- bodyguards
- bomb expert group
- priest
- interpreters and translators

- ID Group (Kripos)
- HSE
- ICT and connection experts

### **Liaisons**

In some situations, it may be beneficial to call upon a liaison, who will function as a link between another organization and the police staff but does not affect responsibilities and management in the police. Liaisons can also serve as an advisor for the senior management. However, the liaisons cannot make decisions on behalf of the staff without their clearance. They must keep their own organization informed about the staff's assessment and strategy.

### **The Incident commander**

The Incident commander is the executive leader of the DCP at the tactical level of management. Incident commander has the authority to make orders for the task force regarding concrete action or operation.

In case of accidents where human life or health is threatened, the efforts will be carried out by three overall professional areas of responsibility:

1. Overall management and coordination are handled by the incident commander.
2. Responsibility for technical efforts and safety in the incident area is often handled by the fire department under the guidance of an incident commander fire at rescue service, otherwise this will usually be the responsibility of the police.
3. Responsibility for the medical efforts, including health care assessment, prioritization, treatment and patient transport, is handled by the health care services under the guidance of an incident commander health.

The Incident commander has the following tasks:

- lifesaving efforts together with the other emergency services
- leading and coordinating efforts between emergency services and other actors
- safeguard security of the incident area and set up barriers preventing criminal offenses
- ensuring peace and order
- initiating investigations
- registering/ identification of involved persons (survivors, evacuated, injured, dead)
- hand over the venue back to the owner after the effort and possibly investigation has been completed
- media relations

In case of major events, the incident commander organizes an on-scene command centre (ILKO). The overall incident command is coordinated from the command centre. By being close to the scene of the incident, the command centre can establish an overview and have access to communication systems and exercise leadership and achieve situational picture more efficiently.



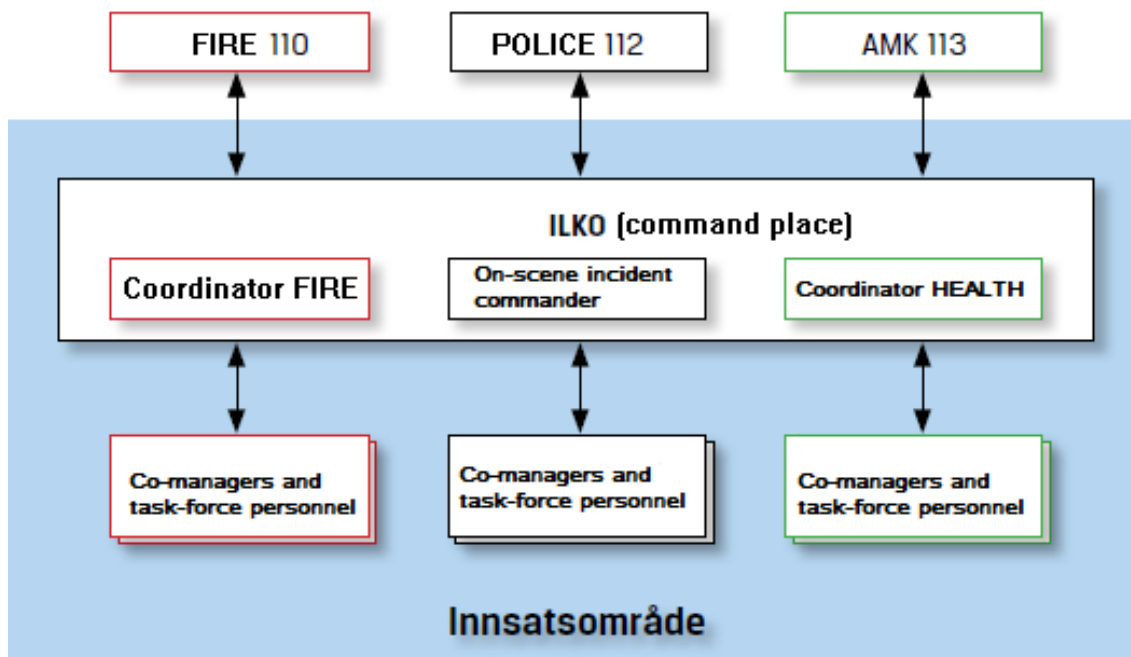


FIGURE 23. PRINCIPLE FOR ORGANIZATION OF INCIDENT MANAGEMENT

#### 1.4.4 Plans and standard procedures presenting the main action patterns

In case of a violent action incident, the police's standard procedures are described in the document "National Procedure – Emergency Institutions cooperation in Ongoing Life-threatening Violence (in Norwegian abbreviated to PLIVO). The PLIVO procedure is a joint procedure for emergency services, the police, fire- and health personnel:

*A PLIVO – operation is an on-going situation, where one or more offenders exert life-threatening violence with weapon / dangerous objects towards innocent persons, and where the police shall in a direct effort neutralize the offender(s) to save life and limit damage. Fire and Health shall actively give support with lifesaving measures (PLIVO, 2015, p. 4).*

The PLIVO procedure applies to a wide range of incidents where ongoing life-threatening violence occurs. This means that the PLIVO procedure also applies to incidents defined as 'counterterrorism'. Ongoing life-threatening violence incidents may occur at different places, such as schools, malls, public transportations and in parks (PLIVO, 2015). The procedure is normative and gives guidance for the planning and the implementation for such situations. The procedure gives general descriptions of action patterns for all three emergency services that are present on scene, as well as guidelines how the personnel from Fire and Health shall act in situations where the police is not present. The procedure is a tool for better cooperation in order to save lives and limit damage in extreme situations.

Furthermore, the procedure describes basic principles at tactical (incident commander and the task force) and operational levels (operation manager and chief of staff).

The PLIVO – procedure is segmented in four parts from A to D. Part A is a conventional introduction to the procedure document. Part B clarifies and defines some core concepts concerning PLIVO incidents in order to increase a joint understanding among the emergency services. Part C outlines general legal conditions concerning the duty to act, and the role and

responsibilities of the employer and the worker related to PLIVO situations. It is worth noting that the document emphasizes that the police have a special act of duty when people’s lives and health are in danger in on-going life-threatening incidents. The first police unit on scene is legally obliged to enter directly the incident without waiting for other police reinforcements. However, if the police are not present on scene (i.e. due to large response time), the emergency leaders from Fire and Health need to consider measures to neutralize one or more offender(s) to prevent further damage. Part D focuses on the implementation of PLIVO operations.

The operations center shall define whether the received message is an on-going life-threatening incident. The PLIVO (2015) present the measure cards (p. 21).

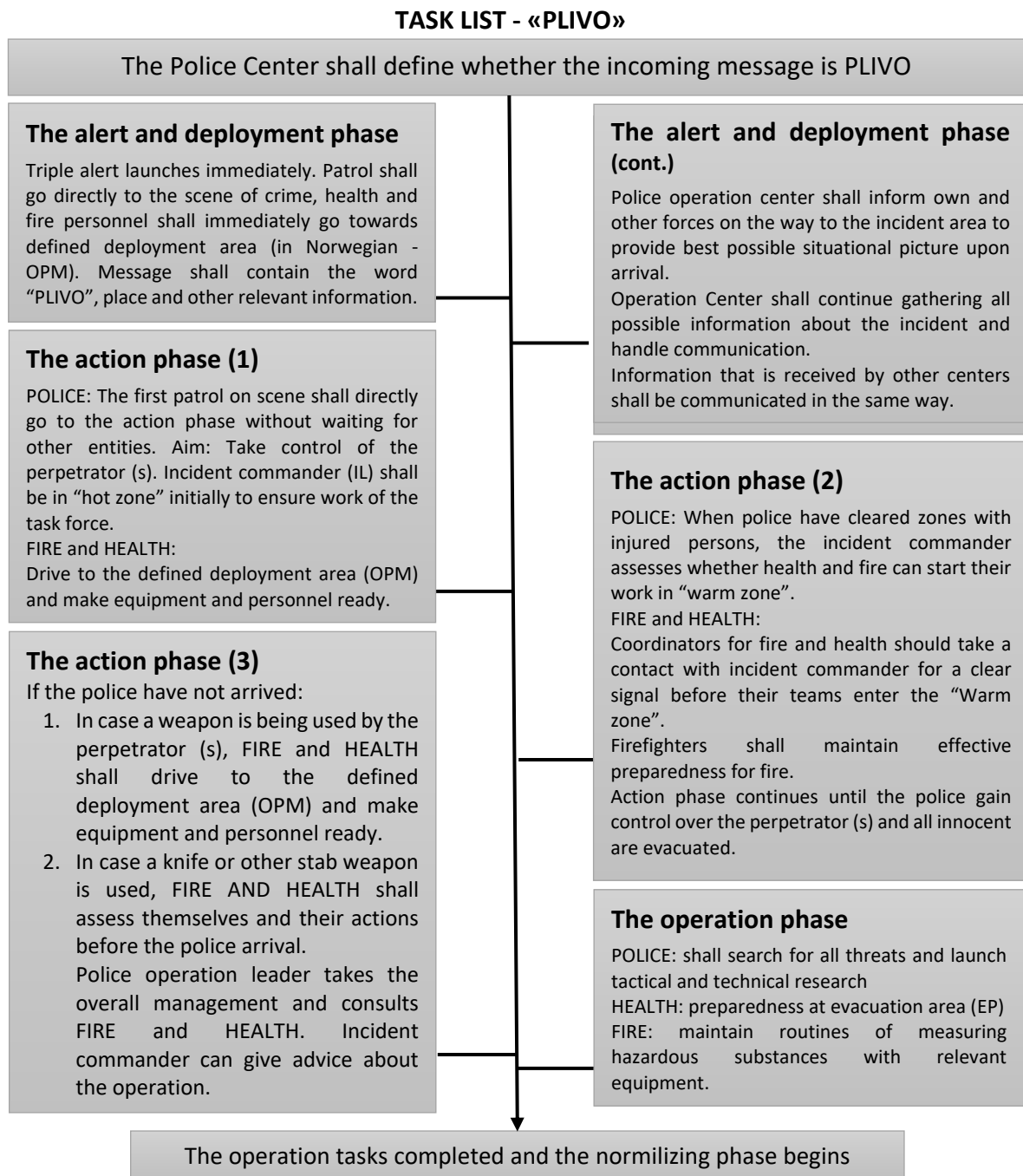


FIGURE 24. PLIVO TASK LIST

The alert and deployment phase cover the time from receiving of the first message by the emergency report center (110, 112 or 113 central) and until the resources are on scene.

The action phase covers the time after the resources from the police, fire and health are in the field of action until the police gets the control over the perpetrator (s) and all patients are evacuated from the area of action.

The main tasks in the action phase:

- Take control of the perpetrator (s)
- Evacuate injured and innocent third parties from the field of action

The operating phase comprises the time after the action phase has been terminated until all operational efforts in the incident area are completed.

The main tasks in the operational phase:

- Triage, life-saving treatment and transport of injured persons to hospitals, emergency ward or other arranged site for injured persons
- Searching for threats (explosives etc.)
- Measurement of hazardous substances.

#### 1.4.5 Reflections on operational patterns of the police within maritime violent actions

At sea, response to violent actions become more complicated as it includes various stakeholders such as the vessel's master, the JRCC, and the operating company. Also, with terrorist acts, the military Special Forces may take an important role. At offshore installation the military special forces will lead the operation according to the framework for the operation set by the Chief of Police.

The situational awareness at may be challenging to achieve, which in turn might hamper the planning process. This calls for extra efforts as to intelligence, and close contact with the officers on board. The logistics challenge in Arctic seas provides a bottle neck for an effective operation. Military transport capacities are needed with longer response time than in the civilian preparedness system.

Within the management system, high complexity, a limited time window, and a challenging context, may cause significant grey zones as to decision making especially in large scale operations. Central questions and challenges to consider are the coordination between SAR and police forces, the command structures, changes in leadership, location, and the responsible leaders for coordination on-scene.

There are different organizational structures in place between the police, the fire brigades, the health care system and the JRCC at operational and strategic level. At the tactical level there is more close cooperation in land operations with the police incident commander in charge and a joint incident command centre with the incident commanders from health and the fire brigades.

There are no common procedures developed for violent action at sea, where the action has to take place on board a ship or a platform. This should be developed in close cooperation with the shipping industry. The complexity of such operations calls for much training among all agencies involved in this kind of actions.

## Russia

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### 1.1 Search and Rescue

#### 1.1.1 Main institutions in the preparedness value chain

The system of maritime search and rescue operations includes coordination from three levels:

- strategic level;
- tactical level;
- on-scene level.

The strategic level is the level of senior level executives (mainly from Ministry of the Russian Federation for Affairs for Civil Defense, Emergencies and Elimination of Consequences of Natural Disasters / EMERCOM, and Ministry of Transport). In the Russian Federation, all issues related to emergency prevention and response at land, are organized within the Unified State System of Emergency Prevention and Response / USSoEPR (Federal law 68, 1994). The Russian Federation maritime SAR operations system as a functional subsystem of USSoEPR is based on cooperation between ministries, agencies and services (Resolution 834, 1995). The main institutions are the Ministry of Transport (responsible for SAR at sea), EMERCOM (responsible for SAR at land and on rivers, lakes, landlocked seas, in territorial waters). They are responsible for coordinating and organizing SAR operations; providing with staff and equipment, managing search and rescue systems; establishing Rescue Coordination Centers or Rescue Coordination Sub-Centers; allocating SAR equipment; coordinating SAR personnel preparedness; working out SAR operations arrangement and procedure, etc.

In addition to the above-mentioned organizations, at the federal level some of the tasks are fulfilled by the Russian Ministry of Defense, the Federal Security Service of the Russian Federation. At the same time, the Ministry of Defense and the Federal Security Service use their own resources and specialists if it is necessary to help people who are in distress at sea, or to fight pirates and in the event of terrorist attacks in the sea areas, or if the other organizations and institutions responsible for recovery operations cannot provide quick assistance. The Ministry of Health involves its specialists if there are injured people or there is a threat to the life and health of people in distress. The Federal Fishing Agency ensures navigational safety of fishing vessels and performs search and rescue operations in the fishing areas.

The tactical level is represented by the Rescue Coordination Center (RCC) or the Maritime Rescue Coordination Centers or Sub-Centers (MRCC/MRCS), EMERCOM crisis centers, regional, municipal, site/facility emergency call centers, and so on. SAR mission coordinators at the tactical level direct the search and rescue operations until their completion or until the futility of further attempts becomes obvious.

The on-scene level is represented when two or more air or sea search and rescue resources work together, performing operations at the scene of an accident. The MRCC SAR mission

coordinator appoints an on-scene coordinator to coordinate the actions of all involved SAR vessels and aircraft. A commander or a master of a search and rescue vessel involved in SAR operation can be an on-scene coordinator, or a master of a nearby vessel who is able to act as an on-scene coordinator. A commander/master of the first vessel arriving at the scene (the actual distress site) usually takes over the control of an accident and acts as an on-scene coordinator until SAR mission coordinator appoints someone else.

### 1.1.2 Organizational model, command systems and external relations

In order to understand the model and structure of the institutions responsible for conducting maritime search and rescue operations, it should be noted that, as a rule, each of these institutions, which are at the top level of management, is a multipurpose agency and performs a number of tasks including carrying out maritime search and rescue operations. Therefore, when analyzing the model and organizational structure of such institutions, we will only study their structural units that are directly involved in search and rescue operations at sea areas of the Russian Federation.

In the Russian Federation, all issues related to emergency prevention and response at land, are organized within the Unified State System of Emergency Prevention and Response/ USSoEPR. The legal basis for the function of USSoEPR are the Constitution of the Russian Federation, more than 60 federal laws, more than 20 presidential decrees, more than 120 decrees of the government of the Russian Federation, 300 ministerial orders, and other governmental regulations and instructions regulating the activities of state authorities in protecting the population and territories from natural and man-made disasters. The USSoEPR structure consists of the territorial and functional subsystems, and has five levels: federal, inter-regional, regional, municipal, and facility-level (Resolution 794, 2003).

Each level includes coordination agencies – commissions for emergency situations. To improve the quality of interaction between various services and agencies responsible for rendering assistance to people in distress at sea, inter/cross-departmental commissions can be formed, which involves specialists from all preparedness institutions. Interdepartmental commissions can be established for a certain period of time or act on an ongoing/regular basis:

- at the federal level – Inter-ministerial Commission for prevention and response to emergencies and ministerial Emergency Commissions in the federal bodies of executive power;
- at the interregional level covering the territory of several subjects of the Russian Federation – Regional Centers for Civil Defense, Emergencies and Response to Consequences of Natural Disasters. The territory of the Russian Federation comprises seven districts: North-West (St. Petersburg), Central (Moscow), the North Caucasian (Rostov), Volga (Samara), Ural (Yekaterinburg), Siberia (Krasnoyarsk), Far East (Khabarovsk);
- at the regional level, covering the territory of a subject of the Russian Federation – Emergency Commissions of the executive authorities of subjects of the Russian Federation;
- at the local level, covering the territory of a city or a village – Emergency Commissions of the local government;
- at the facility level, covering the territory of an organization or facility – Facility Emergency Commissions.

The main interdepartmental commissions responsible for actions coordination and control of search and rescue of people at sea are established under the Ministry of Transport of the Russian Federation and Russian Center for Disaster Medicine of the Health Ministry. Their primary function is to mobilize, organize and bring together all available resources and organizations necessary for successful emergency response operations. In addition, Governmental Commission for emergency situations is established at the federal level in Russia. This Commission is a coordinating body formed to ensure accurate coordination of actions among the executive authorities, state and other organizations in order to implement state policy in the field of prevention and response to natural and man-made emergency situations.

Territorial subsystems of USSoEPR are created in the regions of the Russian Federation for prevention and response to emergencies within their territories. Permanent management bodies of the USSoEPR are the following:

- on the federal level – EMERCOM of Russia;
- on the interregional level – interregional EMERCOM departments for civil defense and emergencies;
- on the regional and local levels – regional EMERCOM directorates and management bodies for Civil Defence and Emergency created within the structure of executive authorities of subjects of the Russian Federation and local authorities;
- on the facility level – departments (sectors or designated persons) of Civil Defence and Emergency.

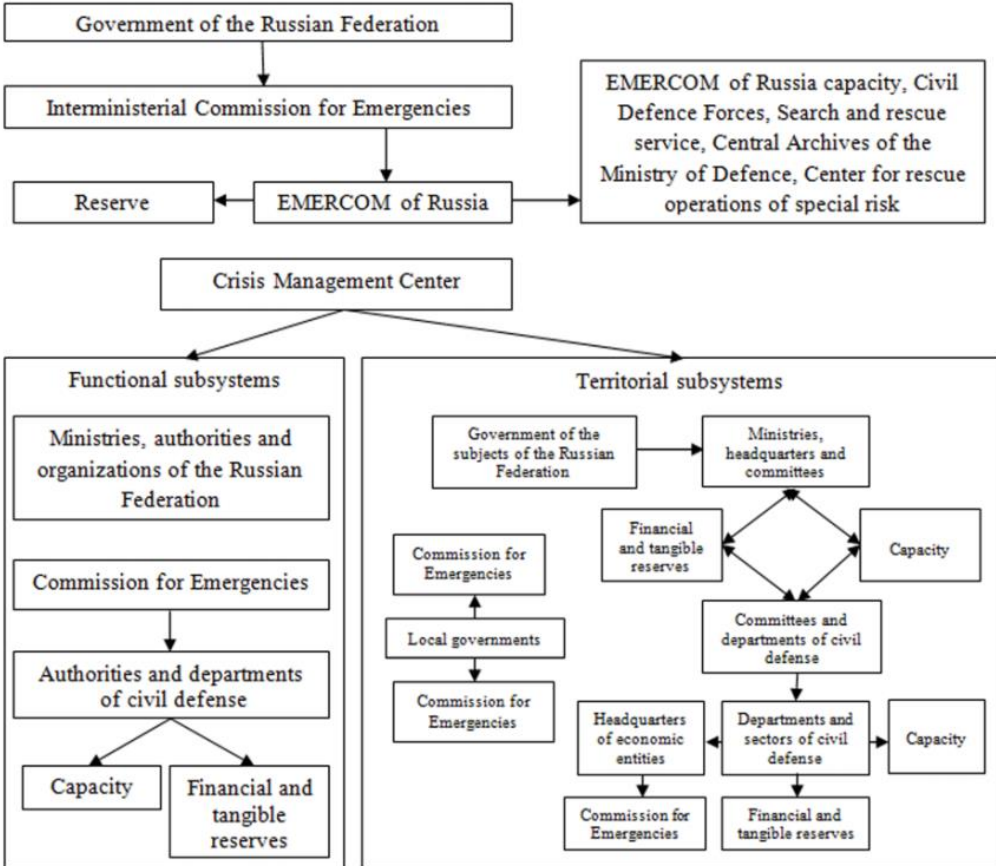


FIGURE 25. UNIFIED EMERGENCY PREVENTION AND RESPONSE STATE SYSTEM IN RUSSIA

Daily services – command and control centers (crisis management centers), centers for day-to-day operation and service; information centers, unified centers for monitoring and operation control situated on fixed or mobile command posts equipped with all necessary control, communication facilities, signaling devices, survival kits, maintained in constant preparedness.

Functional subsystems of USSoEPR are created by the federal executive bodies for organizing work for population in the field of their activities and their assigned sectors. The Russian Federation maritime SAR operations functional subsystem determines safety and SAR procedures at sea. EMERCOM is responsible for coordination of federal authorities' activities during SAR. The Ministry of Transport is in charge of organizing all procedures and maritime SAR responses. Measures to prevent and reduce the damaging effects of emergencies (including accidents at seas of the Far North of the Russian Federation) are conducted on the basis of IAMSAR manual, the plan of federal authorities interaction for emergencies response at sea and water basins, as well as regional cooperation plans and guidelines of federal executive authorities, regional authorities, local governments, public associations and organizations, and international stakeholders.

If there is no threat of an accident, institutions operate in normal day-to-day working regime. According to the decisions made by the Head of federal and state executive authorities, regional authorities, local governments, and organizations, which are authorized to fulfill emergency management responsibilities can introduce the following regimes:

- Daily regime;
- Regime of high alert – if there is a risk or threat of an accident;
- Emergency situation regime – if there is an emergency situation and necessity to respond to it.

As to the external relations, formal and informal mechanisms are complementary. The formal coordination defines the roles and functions of the interacting organizations, establishing the operative coordination procedures and patterns of interaction on a daily basis. The formal coordination is primary in the system. It defines the structure, roles and functions of the interacting organizations (its formal organizational structure) and establishes the operative coordination procedures and patterns of interaction in an emergency situation.

Informal coordination is common among the actors, who are well known to each other. Incentives for informal coordination are increased by organizational interdependence which is based on the commonality of purpose. Informal contacts help actors to solve practical challenges both in their daily activity and in emergency situation, thus functioning as important complementary coordination tools. By compensating for the shortcomings of the formal mechanisms, informal coordination contributes to the effectiveness of the system. Interdependence among the actors within the systems is based on a shared commonality of purpose (Sydnes, 2011). Informal contacts (through personal phone contacts, direct requests, correspondence, and electronic mails) are especially important in emergency situations. Empirical evidence indicates that mutual dependence is high among organizations in the Russian system. United by a common purpose, participating actors rely on each other's inputs to provide effective SAR. This facilitates incentives for effective coordination because the actors are mutually dependent on each other's resources.

**EMERCOM** is the federal executive body at the higher level responsible for the organization of search and rescue operations. It makes and submits proposals to the government and president of the Russian Federation in the field of public safety; drafts laws, other regulatory legal acts and technical regulations within their competence; drafts plan how federal executive bodies are to cooperate and interact with each other during SAR. EMERCOM draws up and approves an annual plan of main activities, rules and guidelines for qualification evaluation of the executive/managing staff in the field of public safety; organizes SAR in inland waters and territorial seas according to cooperation SAR plan used within and between federal executive bodies; carries out prevention of emergency situations that may occur at potentially dangerous water transport and facilities in inland waters and territorial seas of the Russian Federation.

Responsibility for above mentioned functions is handled by the public water safety central administration which is the main structural division of EMERCOM. There are EMERCOM directorates in every region. The Public Water Safety Department is a structural division of Public Water Safety Central Administration, and its main objective is to provide preparedness and coordination of search and rescue of people at landlocked sea areas and in territorial waters.

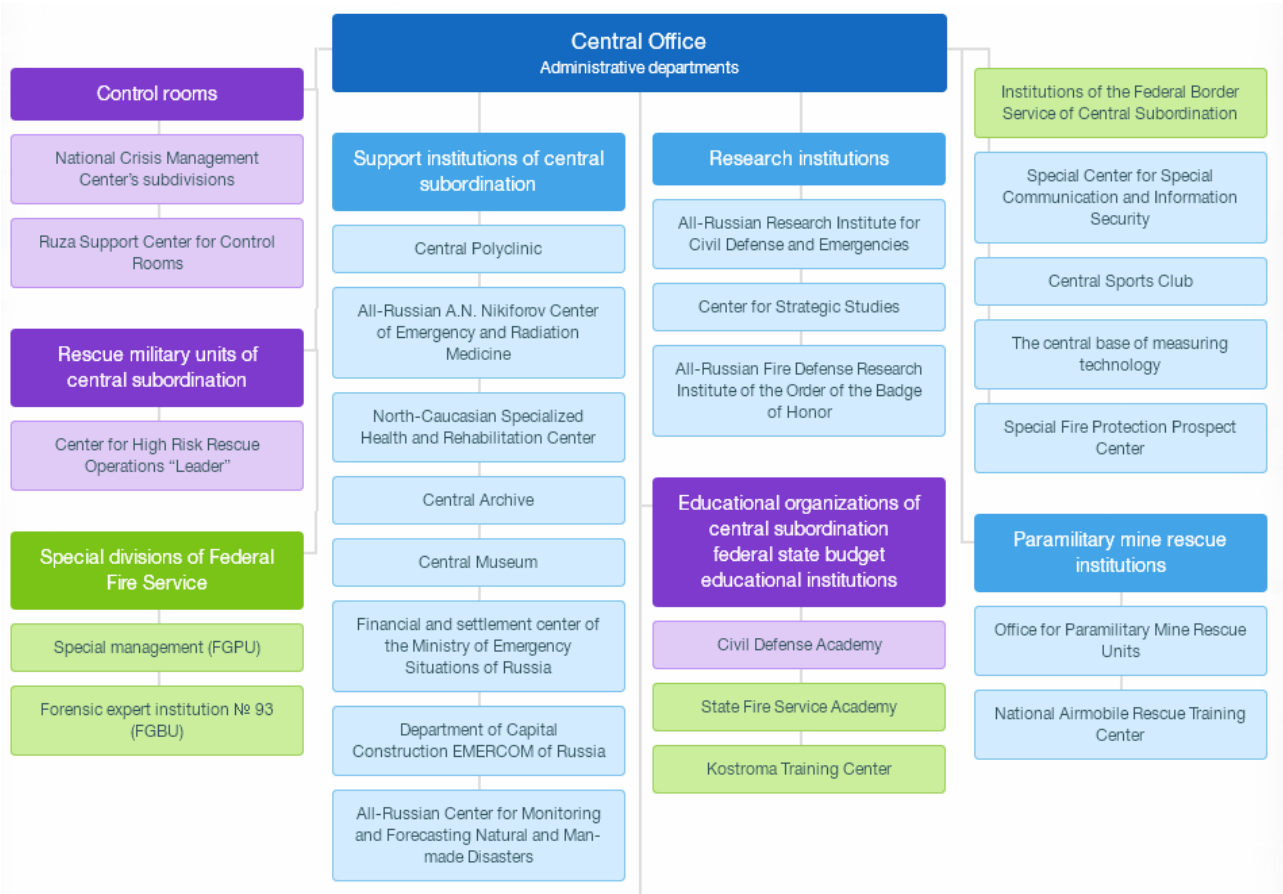


FIGURE 26 STRUCTURE OF EMERCOM. CENTRAL OFFICE (SOURCE: [HTTP://EN.MCHS.RU/MINISTRY/STRUCTURE](http://en.mchs.ru/ministry/structure) )



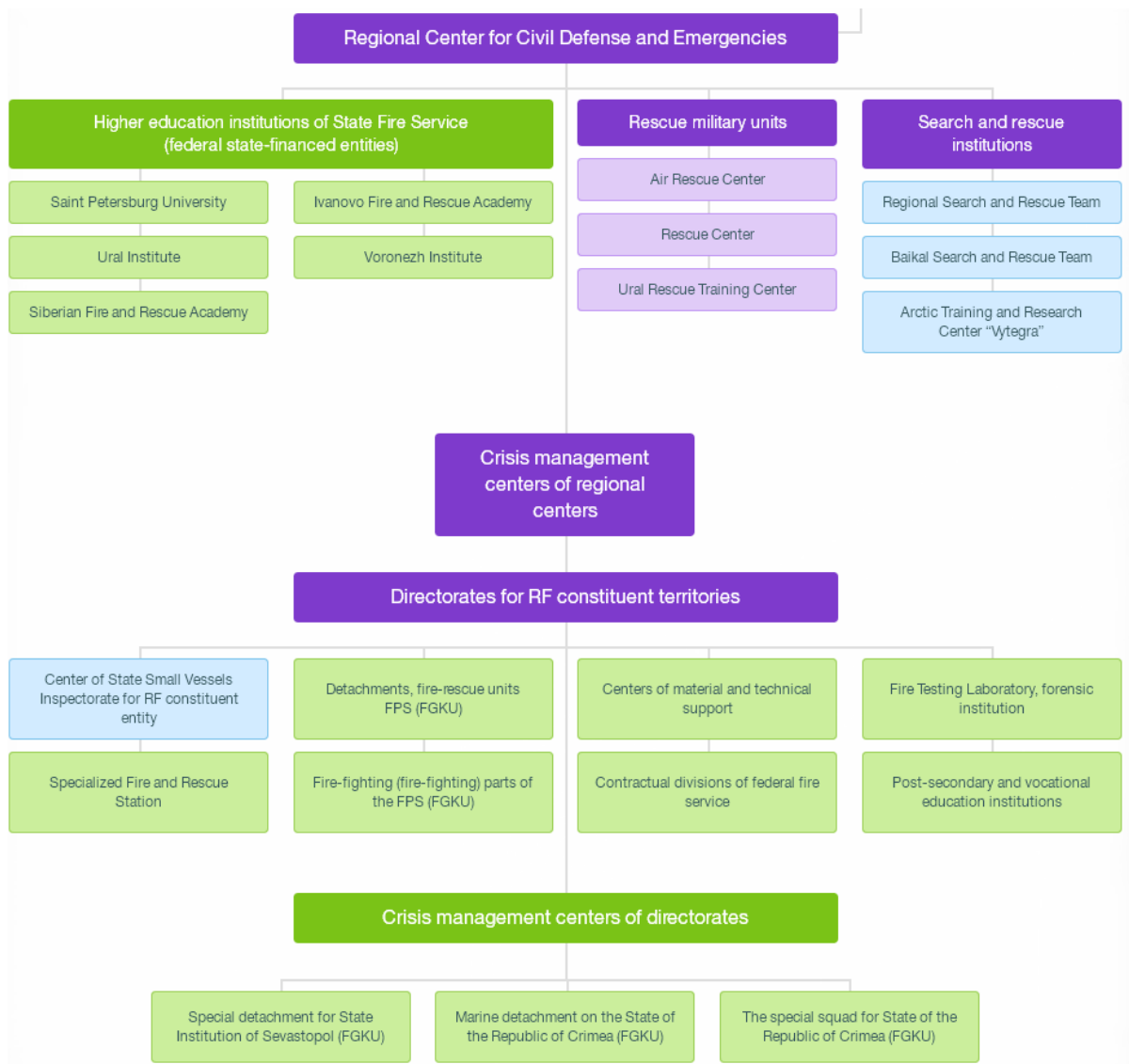


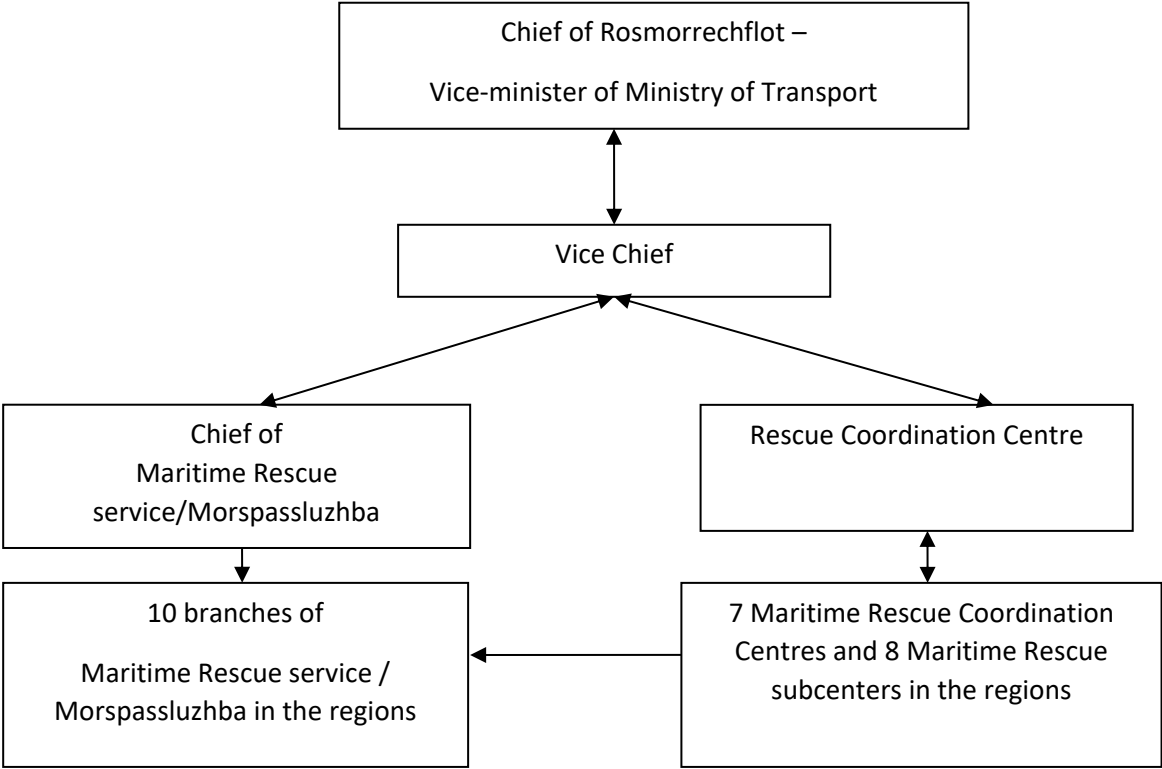
FIGURE 27. STRUCTURE OF EMERCOM. REGIONAL CENTERS (SOURCE: [HTTP://EN.MCHS.RU/MINISTRY/STRUCTURE](http://en.mchs.ru/ministry/structure))

**Ministry of Transport** includes Federal Air Transport Agency – Rosaviatcia, and Federal Agency of Sea and River Transport – Rosmorrechflot. Federal Air Transport Agency (<http://www.favt.ru/>) carries out aeronautical SAR operations and provides state services in traffic and transport safety within the functional subsystem of civil aviation SAR. It is the managing body of the unified system of the aeronautical search and rescue in Russia at the federal level and reports to the Ministry of Transport. 127 aircrafts and helicopters of Air SAR centres in total must be on duty at airports in Russia. The main task of these divisions is to provide assistance to aircrafts and their crews and passengers in distress, but the SAR resources of the aeronautical search and rescue in Russia can also be involved in SAR operations providing assistance for example to ships.

Rosmorrechflot is the competent authority in the field of maritime and inland waterway transport to fulfill obligations arising from the international treaties of the Russian Federation. Its activities are planned, defined and regulated by the orders of the President of Russian Federation, decisions of Maritime Board, Collegium of the Ministry of Transport, Transport

Strategy of the Russian Federation for the period up to 2030 and Federal Program "Development of the Transport System of the Russian Federation (2010-2020 years). The tasks of Rosmorrechflot include the administration of seaports, issues of permits for navigation, maritime rescue and coordination, prevention and response to oil spills at sea, certification/attestation of rescue services, rescue units, rescuers and citizens acquiring the status of a rescuer engaged in search and rescue, maintenance of marine activities, certification of captains of inland navigation vessels, crew members certification for river vessels, construction, development and maintenance of infrastructures in the field of maritime transport, river ports; icebreaking support, and other tasks.

Particularly, Rosmorrechflot is responsible for marine traffic and transport safety and includes federal state-financed institution Marine Rescue Service / Morspassluzhba with 10 branches in the regions and federal state-financed Rescue Coordination Center, with 7 Maritime Rescue Coordination Centers/MRCC and 8 Maritime Rescue sub-centers/MRSC in the regions.



**FIGURE 28. MARITIME SAR WITHIN ROSMORRECHFLOT**

The principal tasks and responsibilities of Morspassluzhba is to organize and conduct SAR operations of people and vessels in distress at sea; to coordinate actions of federal level executive institutions and similar rescue services from foreign countries involved in SAR operations at sea; to organize and conduct work on oil, petrochemicals and other chemical spill response at sea; to organize and conduct ship-lifting, salvage-diving and towing operations at sea.

The Rescue Coordination Center located in Moscow provides management and control within the state functional subsystem on maritime SAR and supports the national maritime SAR system according to the updated requirements of the International Maritime Organization. Within the functional subsystem, the Rescue Coordination Center manages the MRCCs and MRSCs in issues of maritime SAR operation organization. The MRCCs and MRSCs are fully functional and operate 24/7 with the focus primarily of the safety of life at sea and comply with the international and national acts and requirements. This entails interaction with the various government entities involved in maritime rescue at sea.

The MRCC and MRSCs perform administrative and operational duties. Administrative duties are concerned with maintaining the MRCC in a continuous state of preparedness. Operational duties are concerned with the efficient conduct of SAR operations or exercises. In everyday activities, MRCC and MRSC subordinate to the Administrations of Maritime Ports in water areas of their location. The Administrations of the Maritime Ports function in accordance with the regulation act approved by the Ministry of Transport and provide organizational, material, technical, and financial guarantee of the port captain functions, and ensure shipping safety in the maritime ports and in the access areas, SAR preparedness, and SAR operations. The Head of the Administrations of the maritime Ports may not interfere with the Port Captain activities. In issues of maritime SAR operation organization, MRCC and MRSC report to the Rescue Coordination Center in Moscow, MRSCs also report to the MRCCs in water areas of their location.

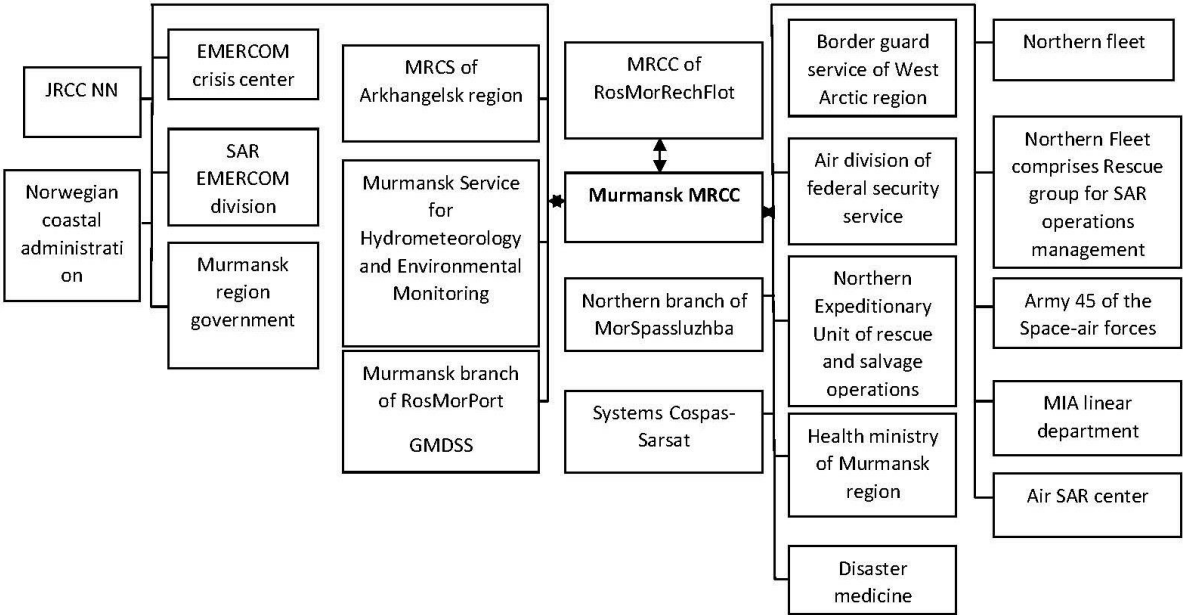


FIGURE 29. SAR INTERACTION IN THE MURMANSK MRCC RESPONSIBILITY AREA. SOURCE: [HTTP://WWW.SMRC.RU/DEYATELNOST/BASSEYNOVYIE PLANYI POISKA I SPASANIYA.HTML](http://www.smrcc.ru/deyatelnost/basseynovye_planyi_poiska_i_spasaniya.html)

Naval Fleet, which is a part of the **Ministry of Defense** participates in search and rescue at sea in the Arctic. The Northern Fleet is part of the Naval Fleet. Northern Fleet comprises Rescue group for SAR operations, which is responsible for carrying out SAR operations in the High North's waters. The SAR department of the Northern Fleet include two SAR divisions. One is

located in Severomorsk and owns the SAR vessels «George Titov» and «Michael Rudnitsky» equipped with deep-operating vehicles, tugboat, and fire and diving vessels. The SAR team in Severodvinsk has a SAR tugboat, and fire and diving vessels.

The Army 45 of the Space-air Forces was established within the Northern Fleet in 2015 to provide air monitoring in the Arctic. The special troops include units and subdivisions of reconnaissance, signal communications, radio engineering support, automated control systems, electronic warfare, engineering, search and rescue, meteorology, aeronautics, moral-psychological, logistical and medical support, and units of support and guarding of military control bodies. The SAR units and subdivisions are designed for organizing and providing searches for aircrafts in distress and helping them.

## NEW ORGANIZATIONAL STRUCTURE OF THE RUSSIAN ARMED FORCES

The organizational structure and the number of personnel in the Russian Armed Forces have changed drastically since the beginning of the current military reform in 2008

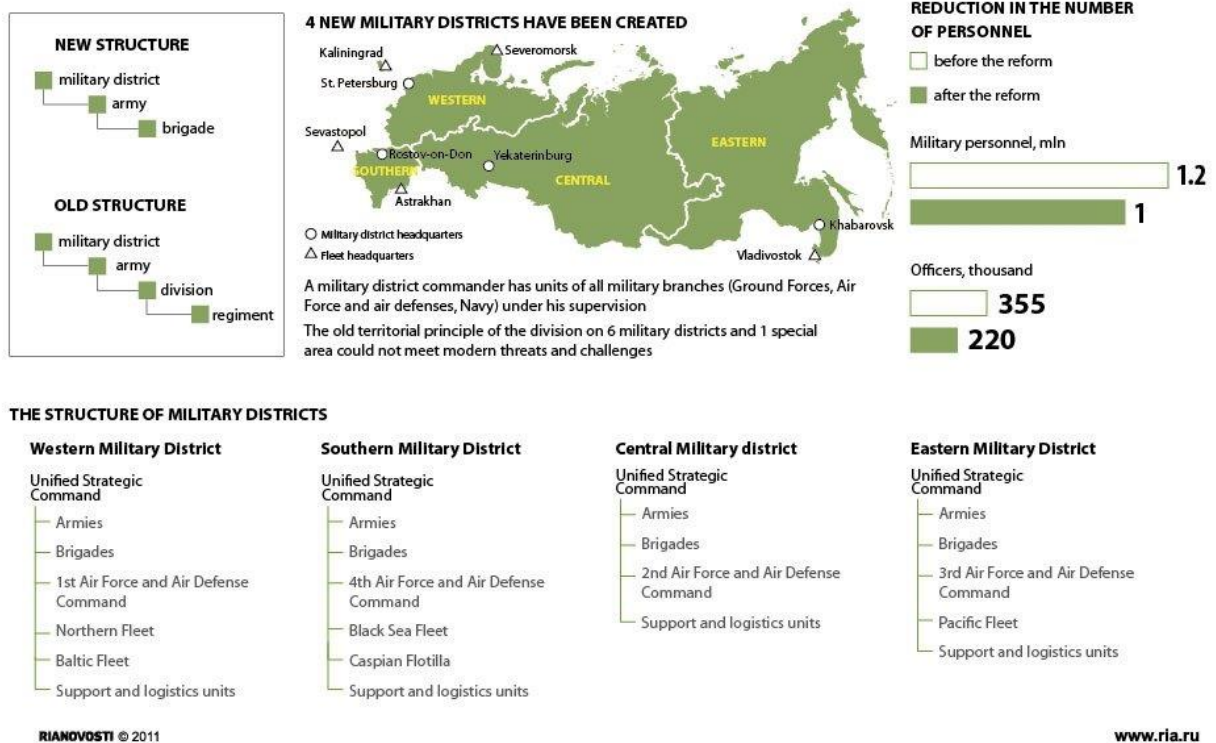


FIGURE 30. NEW ORGANIZATIONAL STRUCTURE OF THE RUSSIAN ARMED FORCES

Similar functions from the part of **Federal Security Service** are performed by the Federal Border Guard Service of Murmansk and Arkhangelsk Oblast with the main office located in Murmansk.

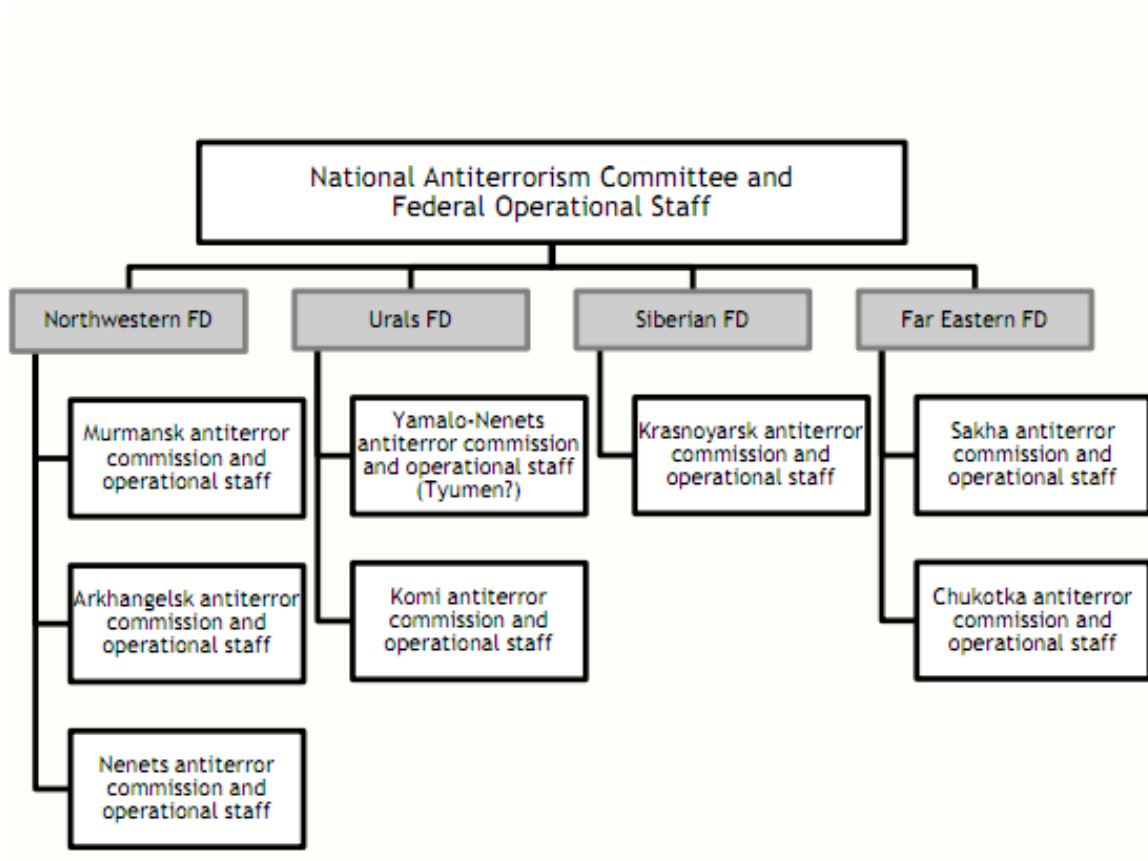


FIGURE 31. SYSTEM OF THE NATIONAL ANTITERRORISM COMMITTEE AND FEDERAL OPERATIONAL STAFF

The Russian Coast Guard has various missions, such as the protection of Russian maritime borders, ensuring safe navigation in territorial waters, assisting vessels and aircraft, weather reconnaissance, fisheries protection, and fighting against smuggling and piracy. To perform these missions the Russian Coast Guard uses a variety of vessels and aircrafts.

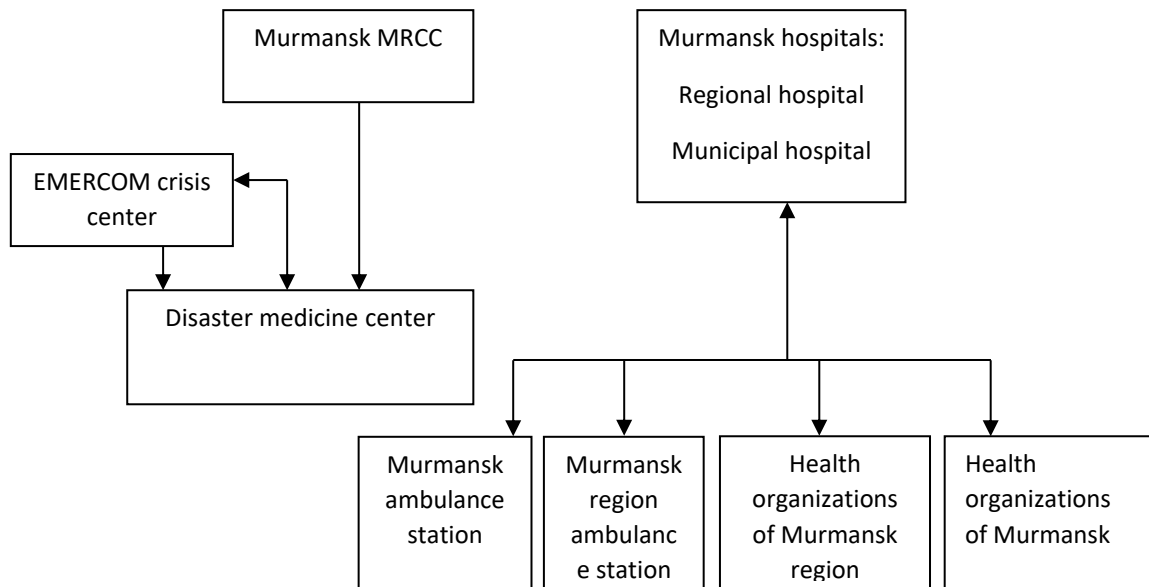
The **Federal Fishing Agency** takes charge of safe shipping of fishing fleet in fishing areas according to the Merchant Shipping Code. The Federal Fishing Agency reports to the Ministry of Agriculture. Since 2013, the functions to ensure shipping safety of fishing fleet and to respond to emergency situations have been assigned to the Far Eastern Expeditionary Unit of rescue and salvage operations and Northern Expeditionary Unit of rescue and salvage operations (<http://www.seoasr.ru/RescueFleet/rf>). Main activities of the Expeditionary Units of rescue and salvage operations are to ensure navigational safety of fishing vessels and to perform search and rescue operations in the fishing areas.

Medical rescue of people in distress at sea is organized by the center for disaster medicine which is responsible to the **Ministry of Health** of the Russian Federation. Ministry of Health oversees developing methodology to coordinate activities of the center for disaster medicine. The head of the regional center for disaster medicine takes charge of the medical part of the SAR operation and is directly responsible to the head of regional committee of prevention and response to emergency situations.

To provide medical aid to people in distress at sea, the center for disaster medicine is included in the structure of the Ministry of Health and comprises:

- at federal level: federal state establishment “Russian center for disaster medicine”
- at regional level: regional centers or branch offices of the center for disaster medicine.

The structure of the regional Center for Disaster Medicine involves Supervisory department, Methodology and Organization department, and Emergency and Civil Defence department. Besides, all hospitals, ambulance services, and air ambulance are included in the system of providing assistance to the injured at sea.



**FIGURE 32. COMMAND SYSTEM BY MEDICAL ASSISTANCE IN THE MURMANSK REGION. SOURCE: [HTTP://WWW.SMCC.RU/DEYATELNOST/BASSEYNOVYIE\\_PLANYI\\_POISKA\\_I\\_SPASANIYA.HTML](http://www.smrcc.ru/deyatelnost/basseynovyye_plany_i_poiska_i_spasaniya.html)**

**Federal Service for Hydrometeorology and Environmental Monitoring / Roshydromet** reports to the Ministry of natural resources and ecology. It is a federal executive body responsible for providing government services in hydrometeorology and related areas, monitoring the environment and environmental pollution, and exercising government oversight of activities influencing hydro meteorological and other geophysical processes. Roshydromet has 25 departments in different regions of Russia including the Murmansk office and the Northern office (6 northern regions along the Arctic coast).

There is also a contract agreement for the provision of meteorological services to civil aviation between Roshydromet and the Federal Aeronautical Service of Russia, which acts as an executive body to provide state services in the air transport and the uniform air transport system in the Russian Federation.

Meteorological services for aviation users are provided in compliance with the Manual on meteorological services for Russian civil aviation and recommendations of ICAO Annex 3/WMO technical regulations and national peculiarities of meteorological services to facilitate flight regularity, efficiency and safety for the aerospace in the Russian Federation. Meteorological services for aviation comprise mainly aeronautical meteorological

observations; aerodrome weather, en-route and flight area forecasting and warnings; crew consultation during the pre-flight preparation; etc. Similar services can be provided to the maritime emergency services. By oil spill responses and exercises, Roshydromet calculates the oil spill area and oil slick movement.

**Ministry of Internal Affairs (MIA) line departments of water transport** is in charge of counteracting any criminal activity in the coastal parts. The regional directorates and line departments of water transport are located in every region of Russian. Being in charge of the water transport security, personal security and public order and safety on the sea vessels and port facilities, line departments of water transport play a key role in providing security and safety on the water transport. Their responsibilities for people's security, public order, and safety include active involvement in handling emergency situations such as accidents, catastrophes, fires, and natural disasters and cooperation with other MIA departments in saving lives and giving injured people first aid, as well as being present at the scene of action. In addition, MIA provides security along the transport routes, stations, railway stations, airports, seaports, river boats and aircraft. Regional line departments of water transport are also engaged in the crime and wrongdoing prevention work by organizing search and rescue actions to prevent and stop criminal activity in the sphere of cargo and passenger transportation, transportation economy, detecting circumstances leading to criminal offences and making efforts to eliminate them.

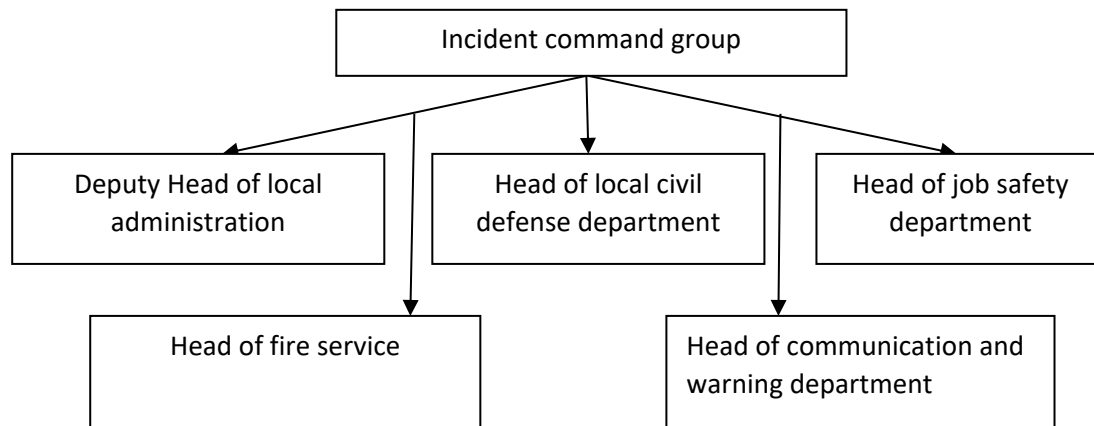
### 1.1.3 Operational hierarchy and management responsibilities

#### **Strategic level**

According to the legislation, the functions to coordinate the SAR activities of the federal authorities at sea and at landlocked seas are assigned to EMERCOM. As it was mentioned above, the main structural unit of EMERCOM, responsible for coordination of marine SAR operations is Public Water Safety Central Administration. The federal government commission for prevention and response to emergencies is responsible for the coordination of the activities of ministries and involved organizations in order to ensure the unified state policy in SAR at sea and landlocked seas. The Head of the commission is the minister of EMERCOM. During an emergency, the emergency commissions can be transformed. The need for fast, coordinated response transforms the system towards a simplified structure and reduction in bureaucratic procedures. A notable feature is, that its organizational structure changes drastically in the emergency mode. The configuration is transformed into a more linear structure. This emergency-mode structure resembles the simple structure configuration consisting of the strategic apex and operational core (Sydnes, 2011).

As a result, the incident command group is created within the commission. The incident command group provides the emergency scale and emergency forecast development, organizes and manages the response, coordinates and controls the activities and interaction of the involved organizations. The members of the incident command group prepare the plans of further activities, necessary resources, financial, medical and other means for the head of the commission.





**FIGURE 33. VERSION OF THE EMERGENCY COMMISSION.**

The Ministry of Transport is in charge for the organization of all activities related to SAR at sea and the coordination of all involved organizations via MRCCs and MRCS.

The ship owner or the operating company is responsible for preparing emergency response plans for the vessel. In situations where the emergency on board the vessel develops relatively slowly or is at its early stages, the master and the crew will generally lead the response. The master should alert relevant authorities about the emergency, so that they can start preparations in case the situation evolves. The master or the ship owner can request some assistance, but the overall coordination is handled by the master while the situation is under control. If the emergency evolves to the point where the ship owner and the ship crew cannot handle it, the coordination will be passed to the MRCC and the relevant response authorities onshore.

The ship owner or the company can support emergency response on a strategic level. They may and should offer their assistance in providing health care support, personnel, media, next of kin communication, reception, and follow-up arrangements for evacuated passengers and employees. The ship owner will need to work with the MRCC in order to be informed on the condition and location of the passengers and personnel, and the established reception point. The company should clearly define and document the master's responsibility with regard to implementing the safety and environmental protection policy of the company; motivating the crew in the implementation of that policy; issuing appropriate orders and instructions in a clear and simple manner; verifying that specified requirements are observed; and reviewing the SMS and reporting its deficiencies to the shore based management. Besides, the company should ensure that the master is properly qualified for command, fully conversant with the company's SMS; and given the necessary support so that the master's duties can be safely performed. The company should ensure that each ship is manned with qualified, certificated and medically fit seafarers in accordance with national and international requirements (The International Safety Management Code IMO Assembly Resolution A.741 (18) - 1993).

Depending on the scale and type of an incident, the strategic level in major maritime emergencies would most likely include also insurance and salvage companies, port and maritime authorities, local county or community representatives, federal government committees, military, and other relevant agencies.



## Operational level

The International Aeronautical and Maritime Search and Rescue Manual, IAMSAR Manual, published by the IMO and the International Civil Aviation Organization (ICAO) is a directing manual for maritime and aeronautical SAR based on the Hamburg and Chicago Conventions. The IAMSAR Manual contains practical guidelines for the organization of maritime and aeronautical SAR, mission coordination, operations of search and rescue units (SRUs) and provision of SAR-related training. The manual is not binding but provides a good foundation for the appropriate provision of maritime and aeronautical SAR services.

The person in charge of the operational coordination during maritime SAR incidents is the Search and Rescue Mission Coordinator (SMC) on duty at the time in accordance with the shift schedule. The SMC determines, which emergency phase is at hand and is responsible for ensuring that the MRCC/MRSC responsible takes the actions required by the situation. The SMC is assisted by the other personnel of the MRCC/MRSC. The SMC is responsible for coordinating the searches and rescue of persons in distress at sea. In most cases, the SMC is also responsible for media relations.

SMC should be well prepared on search and rescue procedures, know the plans related to search and rescue, and:

- collect information of emergency;
- develop detailed and feasible plans for search and rescue;
- allocate and coordinate resources required for SAR actions implementation.
- SMC coordinator duties are:
  - to receive and evaluate emergency data;
  - to find out and identify the type of emergency equipment available on board of a missing or distressed vessel;
  - to be informed of the prevailing environmental conditions;
  - to find out, if necessary, navigation and location of the ships and provide vessels with necessary information about possible disaster areas, necessity of search and rescue operations, or observation and / or radio watchkeeping;
  - to map the search area and decide about required methods and means;
  - to make an action plan for search or for rescue depending on what is needed;
  - to coordinate SAR operation with neighboring or nearest Rescue Coordination Centers;
  - to instruct personnel involved in SAR operations and receive information from them;
  - to analyze and evaluate received information and change an action plan if necessary;
  - to organize the refueling of air vehicle, to accommodate for rest personnel involved in SAR operation, if an operation is prolonged;
  - to organize delivery of supplies to support the rescued people;
  - to keep correct and timely records of events in chronological order;
  - to make a report of the current situation and developments;
  - to give instructions to Chief of Rescue Coordination Center on whether to postpone or stop SAR operations;

- to dismiss SAR personnel and return the equipment, when they are no longer needed;
- to inform authorities involved in the investigation of accidents;
- to notify the country where aircraft is registered in, if necessary;
- to prepare final report.

In case there are affected or injured people at sea, the SMC at MRCC or MRCS informs the operations service at the regional headquarters of Chief department of EMERCOM and the regional administration, who in their turn organize the transportation of the injured people from the place of their arrival at the sea port or the airport to the accommodation centre, provide food and clothes, and any other assistance necessary under the circumstances.

Aircraft involvement for maritime SAR is done according to the SAR instruction for a particular territory defined in the Integrated Aerospace Search and Rescue System of the Russian Federation, which is approved by the Chief of the corresponding Inter-regional Department of the air transport of the Federal Agency of Air Transport (Rosaviatsia's IRD). Chief of North-West Inter-regional Department of Rosaviatsia is in charge of the organisation and coordination of aeronautical SAR operation. Chief of the Air Force of the corresponding territorial unit is in charge of the SAR operation, SAR flights provision, and counter terrorism and military operations. Aircrafts are equipped with the necessary radio and other technical facilities to conduct radio and visual search for vessels in distress. The aircrafts have to be SAR airdrop capable (to have trained SAR parachuting crews), to be equipped with rescue facilities and gear. SAR helicopters have to be equipped with landing and searching headlights, launching and lifting gear, be adapted to use lifting gear. SAR aircraft on duty have to have enough fuel supply to cover the SAR territory according to their specifications, i.e. 280 km for MI-8 helicopter, 150 km for MI-2 helicopter, 1100 km for AN-26, AN-30 aircraft, 320 km for AN-2 aircraft and flight time of not less than 40 minutes to conduct SAR of vessels in distress. The standard flight preparedness period for the SAR aircraft on duty is 30 minutes in summer and 45 minutes in winter.

A SAR aircraft team consists of 3 air rescue officers including one doctor. They have to be trained for airdropping to the emergency site with SAR equipment during a day in fair and harsh weather conditions and during a night in fair weather conditions, for landing without parachutes by using lifting gear during day and night in fair and harsh weather conditions, to administer first aid to the injured and to evacuate them from the emergency site. Other aircraft, such as sanitary, off-duty, those not equipped with the necessary equipment or the ones being in the air can be involved in SAR and sent to conduct search and evacuation operations. The aircraft involved in SAR operation (in agreement with Federal Air Agency) can be given the following responsibilities:

- general air reconnaissance;
- rescue of passenger and crew on vessels in distress;
- guidance of vessels to the emergency site.

On receiving the distress signal, the aircraft crew confirms the receipt of the distress signal and contact their air traffic controller (ATC). In case the air crew observed emergency at sea, they need to contact their air traffic controller and inform them about their observations, the position of the emergency site, contacts the vessel or aircraft in distress, enquires about their

conditions and clarifies their position. Upon receiving distress signal from aircraft, the rescue coordination centre:

- assesses the situation, defines the emergency state (uncertainty phase (INSERFA), alert phase or distress phase);
- announces itself (confirms) or via ATC an “Alert” signal for the nearest to the emergency site on duty rescue forces and facilities;
- reports the received distress signal to the Chief of the Department and operations duty officers of MRCC or MRCS and develops proposals on SAR operation for the chief of SAR operation to take decision on organizing and conducting it;
- defines the location of the vessel or aircraft in distress and assesses the distress area borders;
- organizes collection, processing and analysis of data on the vessel or aircraft in distress;
- gets detailed weather forecasts in the distress area at the airports, where on duty aircraft are located, alternate airports and daylight period duration;
- arranges obtaining additional information about the vessel or aircraft in distress;
- informs ATC about the decision to start SAR operation in the area of their coverage;
- conducts and controls SAR operation through ATC at the site of emergency;
- informs interacting SAR coordinating centres;
- informs regional executive authorities, airports and other air traffic institutions and coordinates their activities if they are involved in the SAR operation;
- with the support of the head of the air traffic control, arranges the replacement of the aircraft and the crew, which have already started SAR operation.

The SAR missions are coordinated by EMERCOM’s crisis management centers of the federal, interregional or regional level according to the severity of the crisis. Operations control duty desks operated by regions’ executive authorities and emergency organizations have responsibility to coordinate operations on the regional level. Appropriate operations control duty desks of the dedicated divisions and organizations coordinate missions on the municipal and site/facility level.

The structure of the regional Center for Disaster Medicine involves Supervisory department, Methodology and Organisation department, and Emergency and Civil Defence department. A Supervisory department is in charge on regular basis of 24/7 of collection and analysis of medicinal information, emergency situations forecast; maintenance of alert systems instant readiness, etc.

**In the state of red (high) alert, after receiving the signal (order) to introduce a red alert regime,** the department reports to the chief of the disaster medicine centre, and at his command, activates the necessary part of the medical and sanitary program to assist local people in case of emergency. Also, this department organizes 24/7 work for all the personnel or partly, adjusting the order and structure of detachments, specification of their tasks; collects, generalizes and analyzes data as a precondition for introducing a high readiness regime, forecast of the possible scenarios, preparing a report and reporting to the chief of disaster medicine centre; provides connection with the regional headquarters of Civil Defence and Emergency Situations, regional disaster medicine centre, units and institutions involved with the operation of the all-Russian system of disaster medicine. In the emergency regime, the department provides the following functions:

- informs (according to the plan) bodies of control, units and institutions of the disaster medicine centre to start the emergency regime;
- collects information about the emergency situation, its assessment, reporting the details of the emergency and proposals to organize the medical support of the local population to the chief of the disaster medicine centre;
- advances the disaster medicine units to the emergency scene and starting work to response to the medical and sanitary consequences of the emergency;
- organizes and manages disaster medicine units and bodies that are involved in response to emergency consequences.

Methodology- and organization department is in charge of planning and organisation of personnel training for disaster medicine centre, participation in training sessions for local people and emergency units on administering first aid to the injured. The department also participates in controlling the state of preparedness of forces and means of disaster medicine centre on the regional, local and installation levels, including those reporting to the other ministries and institutions (by mutual agreement), analyzing the work of the regional disaster medicine centre; control over the recording and reporting procedures of the regional disaster medicine centre, medical units and organisations; documentation development to prepare and conduct training sessions with managerial bodies, medical institutions and units of Disaster Medicine Centre, organizing conferences, symposiums etc. The main responsibility of the civil defence units of the regional disaster medical centre are to provide organisational and methodological assistance to strengthen preparedness of local and installations disaster medicine units.

Rescue measures on board a vessel in distress are coordinated by the master of the vessel, including for any external groups that may come aboard. The SMC may assign contact persons for the vessel in distress, the evacuation centre, and other stakeholders with a key role in the mission providing expert maritime SAR assistance.

### **Tactical level**

Where necessary, the SMC appoints an On-Scene Coordinator (OSC) or an Aircraft Coordinator (ACO) to assist the SMC. Decisions regarding the suspension and termination of SAR actions are made by the SMC. In individual cases, the Search and Rescue Coordinator (SC) or their deputy may exercise their right to decide upon a matter. According to the Russian interaction plan, the master of the first rescue vessel arriving at the site, acts as "on-scene coordinator". The master of another vessel arriving at the emergency site, can act as a "coordinator of above-water SAR" until the rescue vessel arrives. If the SAR operation develops over a long period of time, the chief of above-water SAR operation is appointed in order to provide efficient management. He must coordinate the emergency until its completion or until all efforts appear to be pointless. The chief of above-water SAR operation may choose relevant resources to use within the rescue operation including the resources of other involved or private organizations, inquire about additional resources, accept or decline any proposals submitted by other persons within the SAR operation. The master of the vessel is responsible for rescue and evacuation measures on board the vessel in distress. A person appointed as an OSC must have in-depth competence in the tasks.

Under the Maritime Act (674/1994), the master of a vessel who encounters those in distress must, if possible, without this resulting in a major risk to their own vessel or crew or others on board, render all assistance that is possible and necessary to rescue those in distress. Having received a distress alert, the master must report as proceeding to their assistance so that the SMC can assign the vessel to a SAR task. The Maritime Act (Chapter 6, section 11 a) also obliges the master to notify the appropriate MRCC/MRSC if the vessel is in danger of distress. In the event of a distress phase the master must without delay begin distress traffic in accordance with the International Telecommunication Union (ITU) Radio Regulations. Under the Maritime Search and Rescue Act the general obligation to render assistance to those in danger at sea also applies to others than masters of vessels. Under the Act, everyone who is aware of another person being in danger at sea is bound, so far as they can do so without unreasonable danger to themselves or others, to take initiative to take any measures that are necessary and possible to rescue those in danger. The appropriate MRCC/MRSC must be notified without delay of the measures taken.

#### 1.1.4 Plans and standard procedures presenting the main action patterns

Maritime SAR in Russia is conducted according to the SAR basin plans for people in distress at sea by the regional rescue coordination centre. The interaction of SAR partners at sea is done by:

- early notification of the SAR partners about the distress signal from the installation in distress;
- mutual coordination of documentation on SAR operation, provision of medical aid to the injured at sea;
- exchange of information about the location of forces and means of SAR partners.
- When conducting SAR operation, the following interaction pattern is used:
- distress signal is transmitted to the operations duty captain-coordinator of Marine Rescue Coordination Center (MRCC) or the Marine Rescue Coordination Sub-Center (MRCS) by all available types and means of communication;
- on receiving a distress signal the operations duty captain-coordinator of MRCC or MRCS defines a distress state for a particular site judging by the characteristics of emergency and starts a specific procedure to organize SAR operation.

On the strength of the specific circumstances he/she defines priorities of using SAR forces and means of the interacting partners; gives orders to specific SAR units to go to the emergency site; appoints the on-scene coordinator (OSC); informs interacting partners; sets up SAR headquarters; maintains operative communication with the installation in distress, SAR forces and means. In case of receiving a distress signal from a vessel or aircraft, the SMC of MRCC or MRCS has to inform the operations duty officer of the regional FSS. Under orders from the SMC of MRCC or MRCS, all the interacting partners have to provide the necessary forces and means for SAR unless they have already been involved in their specific work. If necessary, SMC can involve the forces beyond SAR partners into the SAR operation.

Informing the SAR interacting partners and maintaining connection between them is conducted by operations duty officers or operations control centres according to the “Awareness and connection plan within organizing partner interaction in the SAR location”. Every interacting and participating partner provides information to the SMC on:

- availability of SAR forces and means, their main specifications;
- the location of SAR vessels and aircraft on the alert at sea, in the ports, airports at 8am every day (local time).

On receiving a distress signal by voice communication, digital selective call, Space System for Tracking Ships in Distress (COSPAS) or institutional communications channels, the interacting partners urgently connect with the SMC and transmit information as detailed as possible about the emergency, measures taken to respond to it and the necessary aid. All the SAR forces and facilities provided by the interacting partners in response to the emergency:

- are at full disposal of SAR coordinator, the SMC or SAR headquarters;
- follow the instructions of SAR coordinator until they instructed to stop doing so.

The on-duty officers of MRCC or MRCS organize the necessary medical assistance to the people injured at sea. Global Maritime Distress and Safety System is used in case of emergency by the captain of the vessel to connect the ship doctor with the doctors at the disaster medicine centre. If the situation is serious, the necessary medicinal forces and equipment can be sent to the site. Institutional distress awareness signal and further communication is conducted by each involved partner according to their internal instructions.

In order to increase efficiency of SAR operations under MRCC or MRCS, SAR headquarters is organized at the seaport under the command of the captain of the seaport. Each interacting partner sends its representative to work in the headquarters. The coordinator on the site of SAR has to inform MRCS, captains of the vessels and ships in distress and captain(s) of ships, vessels and aircraft involved in SAR operation about their decisions, intentions and actions systematically. SAR teams' operations duty officers of the other stakeholders have to inform the SMC of MRCC or MRCS about their SAR forces and means on alert, their location and their state of preparedness.

Rescue vessels put on alert have to have trained crew (when at port, the two thirds of the crew have to be on board the ship), the necessary SAR facilities for performing their function successfully, provided with enough fuel, water and food on board (not less than 80% of the total amount). Aircraft need to have a trained crew, necessary SAR equipment to respond to the emergency and full fuel supply. Every sea port in the SAR territory of MRCC or MRCS has to have a SAR action plan to provide assistance to vessels in distress in the harbor basin and adjacent waters. All SAR partners need to maintain SAR preparedness of their forces and facilities, have to organize training of their SAR vessels crew and emergency response teams, to provide readiness of their emergency vessels and aircraft. The structure, composition and responsibilities distribution among the Ministry of Defence and the Federal Security Service (FSS) is classified information. Their interaction with civil institutions is done according to specific guidelines and instructions whose access is limited to the persons having the right to have access to highly sensitive information in the Russian Federation.

#### 1.1.5 Reflections on the operational patterns within maritime SAR

Information and data presented above show that the Unified State System for Preventing and Eliminating the Consequences of Emergencies has been created and developed continuously in Russia. In accordance with all these governmental policies and procedures, in the Russian System of Prevention and Response to ES we can see the common features of the structure

of various services/agencies responsible for the provision of aid to people in case of emergency and response to disaster consequences. It should be noted, that a highly effective system of rendering assistance to people in distress at sea means its continuous improvement, and it can be seen due to constant changes in the structures and strategies and action plans of its subdivisions. The main reasons, that such changes are needed, are due to appearance of new types of accidents, as well as an increased number of risks and threats to public health and life in sea areas of Russia.

The existing system of rendering help to people in distress at sea is distinguished by a high inertia degree, namely inability to respond effectively in situations related to the new types of accidents not occurring before, as well as situations with a large number of victims. In such cases, managers of all agencies and at all levels are required to be highly qualified in interacting with various departments in the "on-the-spot" mode (i.e., rapid concentration of joint efforts), and to express their personal initiative. As practice shows, when such situations occur, the leading personnel are often unable to effectively manage their subordinates' activities and properly interact with the representatives of other departments and agencies. The main reason for such inertia is the discrepancy between the existing regulatory documents and an unfolding emergency situation. In the circumstances like this, many representatives of the leading personnel and executors of rescue operations, who are acting in accordance with the current instructions, either provide assistance too slowly, or their help does not cover all the people who need it. Besides, the federal interaction plan to provide assistance to people and vessels in distress at sea was established in 1995 and at the moment does not correspond to the reality because many ministries and organizations involved have been reorganized.

Thus, there is insufficient level of interaction with legislative bodies in all agencies responsible for helping people in distress at sea. In addition, in the situations under consideration, there can be seen a psychological effect of being afraid to violate the prescribed rules of action, even if the performers understand that this violation or deviation from the rules will prevent the occurrence of more serious consequences.

Another common characteristic of all preparedness institutions is the complex organization of interaction with similar units and subdivisions of the Ministry of Defense and the Federal Security Service of the Russian Federation. There is no separate subdivision responsible for providing assistance to civil ships in these agencies. Existing units provide assistance to military and civil ships on the basis of special instructions that often considered an official or professional secret. That's why specialists and personnel of public or civil institutions often have to address their requests to the their chief or head of regional level as minimum when help is needed from the side of Ministry of Defense and the Federal Security Service of the Russian Federation. Such organization/way of interaction is very time consuming and it causes a problem in the provision of assistance to people in distress in the High North Sea areas.

Summarizing the above, we can conclude that the current preparedness system and institutions responsible for SAR operations at sea in Russia are able to respond effectively to all types of incidents, as stipulated by regulatory documents. These documents also regulate the activities of all SAR institutions of this preparedness system. In order to improve existing preparedness system, some changes in its structure should be made and new technologies

and equipment for search and rescue of people should be introduced. At the same time, the changes in the structure of the system should be based on bilateral interaction of the authorities of all levels and institutions directly providing assistance to people at sea (priority should be given to the interaction of the institutions of preparedness system of the regional level with the agencies of the federal level, often the "dialogue" between these institutions is the most difficult in terms of organization. But at the same time in most cases the solution of the existing difficulties can be found precisely as a result of the organization of an interaction between these institutions and agencies of different levels of the system). If all necessary important changes mentioned above are introduced to the preparedness system in proper time, search and rescue of people at sea will be highly effective in any theoretically possible threats existing both now and in the foreseeable future.

## 1.2 Oil spill response

### 1.2.1 Main institutions in the preparedness value chain

The Russian Federation regulates offshore oil and gas activity in the Arctic through a complex system of rules derived from the constitution, multiple statutes and decrees, sub-statutes, regulations and other sources of law. The Russian system is based on a hierarchical command structure established at multiple levels: the federal centre makes decisions, while the regions execute them and also bear responsibility for conducting OSR operations in case of emergency (Ivanova, 2011). Russian legislation classifies an oil spill as a "state of emergency" (Resolution 613, 2000). All questions related to emergency situations in Russia, including OSR activity, are the remit of federal authorities and are organized and performed in the framework of USSoEPR, which integrates the state authorities and OSR resources.

OSR in Russia is a tiered system conducted at multiple levels by the federal executive authorities, the administrations of the Russian Federation's subunits (including local administrations) and oil companies (Resolution 240, 2002). The OSR system is divided into sea and land sectors that function under the auspices of two different ministries – EMERCOM - land sector; and Ministry of Transport - marine sector. Both subsystems work independently according to their functions on a daily basis.

The Ministry of Transport is responsible for OSR at sea (Resolution 794, 2003). This is an authority composed of several federal agencies. Subordinate to the Ministry of Transport are the Federal Agency of Marine and River Transport (RosMorRechFlot) and the State Marine Rescue Service (MorSpasSluzhba). The Federal Agency of Marine and River Transport carries out the general management of the OSR system at sea, while the State Marine Rescue Service controls the daily operational activity of the system, its rescue divisions in the regions respond to oil spills at sea (Order 53,2009). Oil spill operations at sea are coordinated by the State Maritime Rescue Coordination Centre (information sharing and warning) reporting to RosMorRechFlot on the federal level, by the Maritime Rescue Coordination Centers and Sub-centers on the regional level. On the local level OSR operations are coordinated by dispatcher centers of maritime transport organizations, ports, RosMorPort's branches, shipping companies and other organizations engaging in petroleum exploration, production, processing and transportation.



Another main actor is the Ministry of Natural Resources and Ecology, which is responsible for policymaking, control and supervision related to the study, use, reproduction and protection of natural resources and the environment. Control and supervision are performed by two federal services: The Federal Supervisory Natural Resources Management Service (Rosprirodnadzor) and the Federal Service for Ecological, Technological and Nuclear Surveillance (Rostehnadzor). Rosprirodnadzor is subordinate to the Ministry of Natural Resources and Ecology, while Rostehnadzor reports directly to the government. Together with EMERCOM, the Ministry of Natural Resources and Ecology classifies oil spills and thereby decides how much the polluting party will be fined (Order 156, 2003).

#### 1.2.2 Organizational model, command systems and external relations

Oil spills are classified by the Russian legislation in terms of their potential severity. Based on the volume of oil or oil products spilled at sea, emergencies can be classified as:

*managed on local level* – oil or oil product volumes under 500 tons

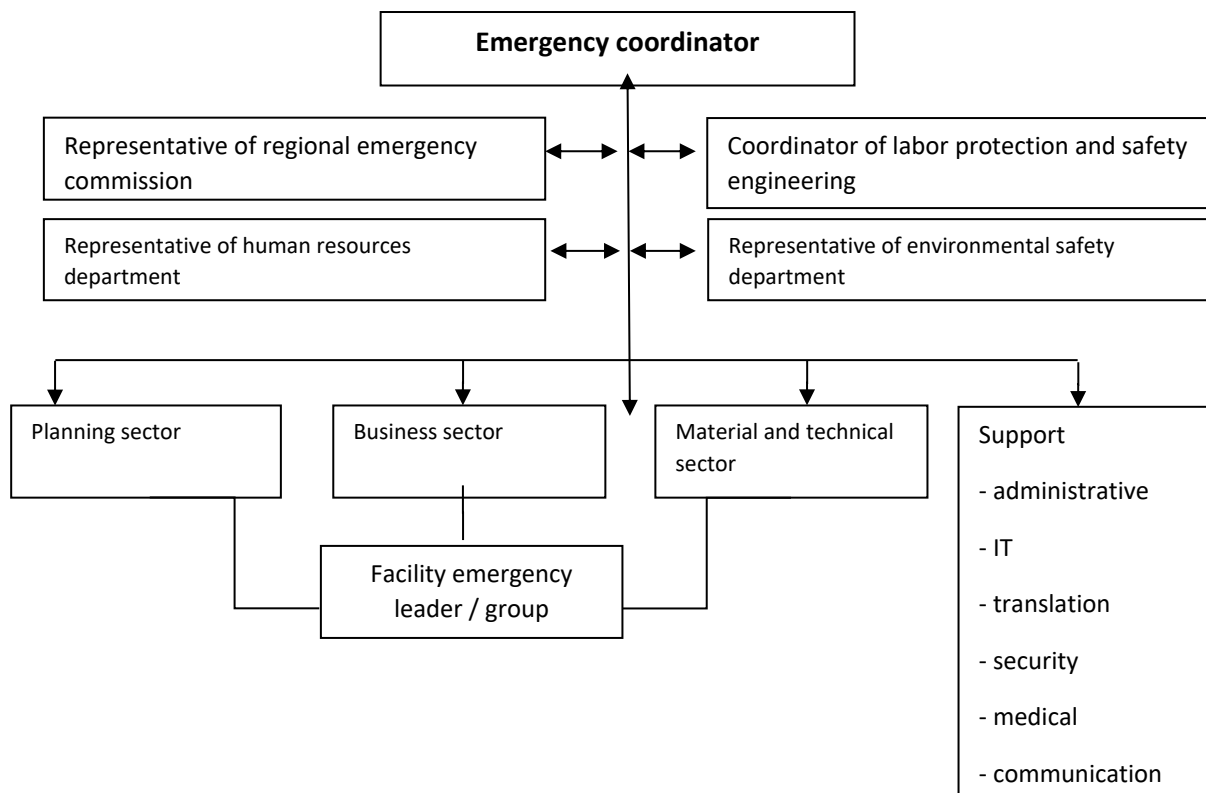
*managed on regional level* – 500-5000 tons of oil or oil products

*managed on federal level* – over 5000 tons of oil or oil products (Government of Russia 2000).

Local oil spills are detected and eliminated by the organizations engaging in petroleum exploration, production, processing and transportation.

The analysis of the contingency plans of private and state organizations operating on the sea shelf of the Russian Federation shows that some companies adopt the structure of the ICS. ICS has the advantage of combining different federal, state, and local agencies and the responsible organisations into the same organizational system enhancing coordination of spill response activities and avoiding duplication of efforts. One example is the contingency plan of the Sakhalin Energy company (see figure 34).

The incident coordination group is the central authority of the Sakhalin Energy, which coordinates all resources and activities to respond to an emergency situation. Its structure is based on the Incident Command System principles and compliant with the state emergency organisation structures. Such incident command structure has the advantage of combining different state, regional and local organizations and the responsible company into the same organizational system.

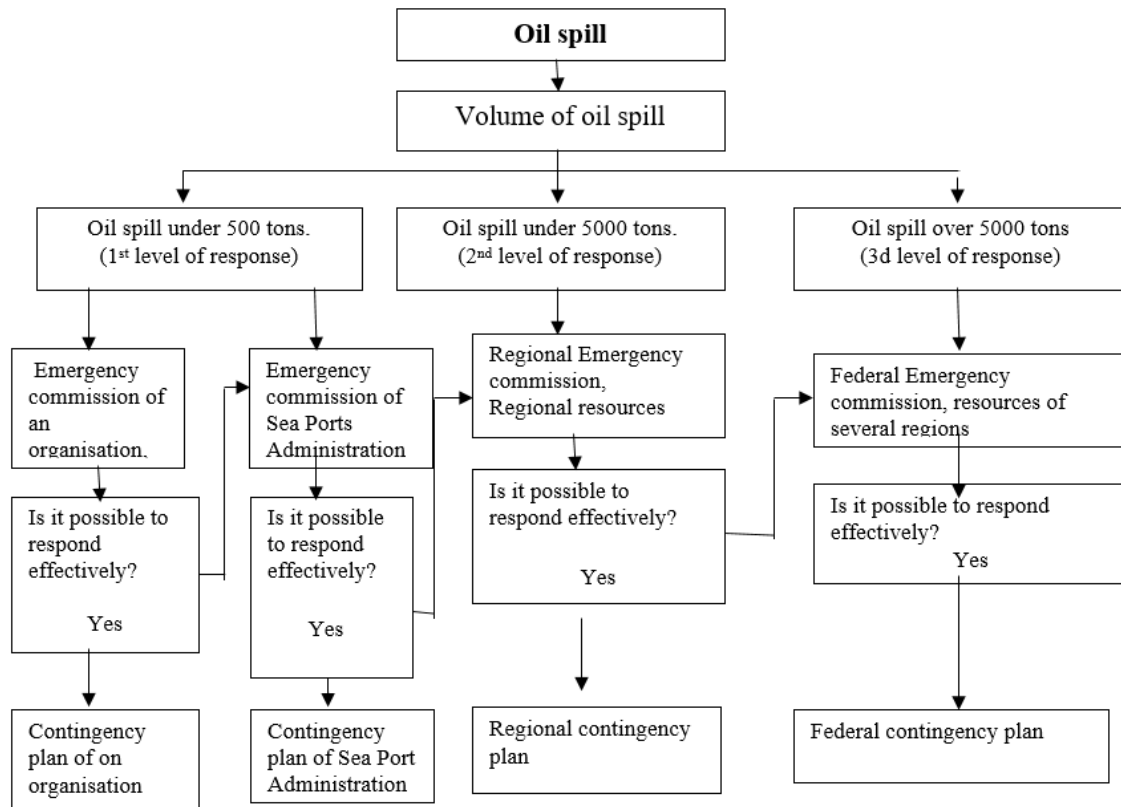


**FIGURE 34. THE ICS OF THE OIL SPILL CONTINGENCY PLAN OF SAKHALIN ENERGY.**

A structure called unified command allows the incident commander position to be shared among several agencies and organisations that have jurisdiction.

The emergency commission in the Sakhalin Energy has duties to implement preventive activities to oil spills and to manage all resources to respond in case of an emergency. The Head of the emergency commission delegates the functions of the coordination to the emergency coordinator. Every emergency leader of a facility is responsible for emergency response at his/her facility. If oil spill volume exceeds the highest rated volume determined in the oil spill contingency plan, and the organization is not able to localize and liquidate it, additional resources have to be involved. If oil spill at an offshore facility is classified as to be responded at the regional level of emergency, and the regional OSR plan comes into action. The emergency commissions, established by the regional governments, play a central role in the OSR system. They function as a permanent body that convenes in the event of an oil spill or other emergency.

Emergency divisions of MorSpasSluzhba (RosMorRechFlot) are standing response resources on the regional level in case of oil spills. A similar procedure is applied if an oil spill extends up to the federal level. Maritime operations are ensured by RosMorRechFlot (Resolution 240, 2004) as the standing managing authority at the federal level via its emergency commission. The authorities that can be involved in an oil spill response include the Ministry of Energy, EMERCOM, the Federal Fishery Agency, etc.; regional executive bodies; and local self-government bodies (Resolution 240, 2004). If the resources are insufficient to provide response in a proper manner, the federal resources will be involved according to Russian legislation.



**FIGURE 35. PATTERNS OF SHIFTING RESPONSIBILITIES ACCORDING TO OIL SPILL VOLUME, CONTINGENCY PLAN OF THE SEA PORT OF NARYAN-MAR (NENETS AUTONOMOUS OKRUG)**

According to the oil contingency plan of the Sea Port of Maryan-Mar (Figure 35), the central part of the incident command structure is the operational block which determines the organisations to be involved in the response or to be informed of the oil spill. The emergency commission may appoint the bodies for other blocks of the ICS structure such as planning, logistics, etc. Depending on the incident location, size and types of response operations required, the incident command may request additional response assets and personnel from other operators in the region or vicinity.

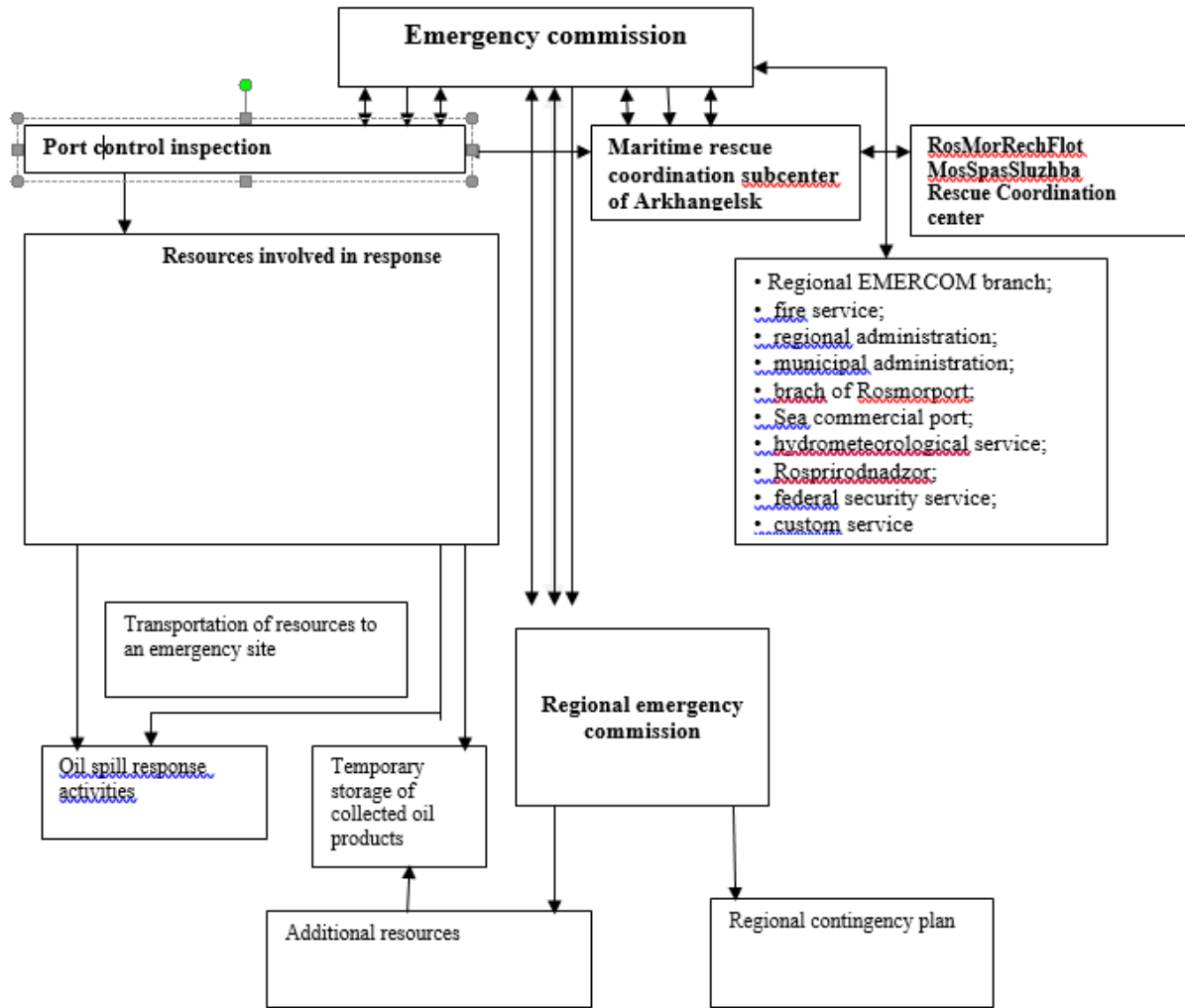


FIGURE 36. OIL SPILL RESPONSE UNDER 500 TONS IN THE AREA OF WATER OF THE SEA PORT OF NARYAN-MAR (NENETS AUTONOMOUS OKRUG).

### 1.2.3 Operational hierarchy and management responsibilities

#### Strategic level

FIGURE 37. RUSSIAN AUTHORITIES WHICH HAVE RESPONSIBILITIES IN RELATION TO OSR AT SEA.

Authorities	Management responsibilities in relation to OSR at sea
Ministry of Natural Resources and Ecology (Minprirody of Russia)	Development of the state policy and normative legal regulations within protection of natural resources, including mineral resources; Setting of the environmental protection policy; Control of the use of hydrocarbon resources; Approval of oil contingency plans.

Federal Supervisory Natural Resources Management service (Rosprirodnadzor)	Responsible for environmental protection policy. Executes control of operators' compliance with the requirements of environmental safety. Responsible for approval of EIAs in a state environmental review, as well as issuing permits for drilling and waste disposal
Federal Subsoil Resources Management Agency (Rosnedra)	Regulation and issuing of licenses for offshore petroleum development
The Federal Service on Hydrometeorology and Environmental Monitoring (Roshydromet)	Conducts state environmental monitoring of marine areas
The Federal Service for Ecological, Technological, and Nuclear Oversight (Rostekhnadzor)	Establishes safety regulations and operating practices; Controls compliance with safety requirements and operating standards
Ministry of Transport of the Russian Federation (Mintrans of Russia)	The competent national authority, responsible for oil pollution incident preparedness and response and empowered on behalf of the Russian Federation to request assistance from other countries or to decide to render requested assistance; Administrative Contact Point in case of acute oil spill; Governmental policy development and normative legal regulation, including in the area of sea transport.
Federal Agency of Maritime and River Transport (RosMorRechFlot)	The competent national authority in charge of organizing the prevention and clean-up of marine oil spills from ships and facilities, regardless of their departmental and national affiliation; Administrative contact point in case of acute oil spill.
Maritime Rescue Service (MorSpasSluzhba)	State system within FARMT with emergency response functions for maritime transport, including matters involving the prevention and clean-up of marine oil spills.

Ministry of the Russian Federation for Civil Defense, Emergencies and Elimination of Consequences of Natural Disasters (EMERCOM of Russia)	Development and supervision of the state policy in the field of civil defence, protection of population and territories against emergencies, incl. acute oil spills at sea; Urgent response to emergencies; Administrative contact point in case of acute oil spill; sets the general requirements and endorsement procedure for the oil contingency plans and approves the plans.
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### Operational level

On the operational level, MRCC and MRCS are operational contact points in case of OSR and coordination functions (on duty 24/7). The coordination patterns are similar to SAR coordination and are developed according to international and national requirements of IMO, Arctic Council and other relevant organizations. The EMERCOM crisis centers inform the personnel and the residents in the area likely to become affected, of the accident. In case of injured individuals on the vessel in distress, EMERCOM will call the ambulance to receive them where they will be disembarked.

### Tactical level

In the event of an oil spill, oil companies immediately have to report to relevant authorities and arrange for response operations.

#### *Study case of the port of Arkhangelsk*

In the port of Arkhangelsk, the entities entrusted with oil response duties are as follows:

- Port Administrations as a standing managing authority;
- Port Administration’s Fire Safety and Emergency Commission as a coordinating authority;
- Port Administration’s Port Surveillance Inspectorate as a coordinating authority (everyday management) in charge of the existing and forecast oil spill data collection, analysis and communication to stakeholders and authorities;
- Arkhangelsk Port Administration’s Operational OSR incident command group, which functions as the Fire Safety and Emergency Response Commission’s operating authority.

If the oil or oil product volume spilled does not exceed 0.3-ton, response will be undertaken by a facility owner and follow the procedures stipulated in his OSR plan or relevant ship’s papers. If the owner is unknown, or the owner’s resources are insufficient to respond to the oil spill, the response will be undertaken by Arkhangelsk MorSpasSluzhba division.

Where the oil or oil product volume spill exceeds 0.3 ton, the MorSpasSluzhba division is to assess the area affected and to perform essential operations necessary to localize the oil slick and collect the oil. The harbor master, upon receipt of oil spill notice, will convene Arkhangelsk Port Administration’s Operational OSR incident command group, in full or partly with some of the members. The duties of the OSR incident command group include response operations

monitoring; assessing the purity of the water area after the oil has been collected; issuing the instruction to stop OSR operations; and redistributing and channeling additional resources in case those available are not sufficient enough. Where the oil spill response appears impossible to be performed using the resources available, the chief of the OSR incident command group will seek assistance from the upper-level coordinating authority, i.e. the Federal Agency for Marine and River Transport's (RosMorRechFlot) Emergency Commission.

Based on the oil spill site assessment results, a decision will be made whether to call on the regional OSR assets or convening the regional OSR incident command groups and launching the regional OSP action plan, or convening the federal operations management headquarters as appropriate. If the decision indicates that the upper-level coordinating authority needs to be convened, the OSR management, as well as all the OSR assets of Arkhangelsk Port Administration's Operational OSR, and OSR incident command groups, will be taken over by the RosMorRechFlot's Emergency Commission.

To ensure public safety, Arkhangelsk Port Administration will inform, via the Arkhangelsk Regional Office of EMERCOM, the personnel and the residents in the area likely to become affected due to the accident. In case of injured individuals on the vessel in distress, Arkhangelsk Port Administration will call the ambulance to receive them at the disembarking site. Arkhangelsk Port Administration can also limit or stop all navigation within the port's water area if required.

#### 1.2.4 Plans and standard procedures presenting the main action patterns

The main requirement of the OSR legislation is the obligatory development of oil spill contingency plans for organisations dealing with oil and oil products. All enterprises whose activities involve operations with oil are obliged to have contingency plans. Contingency plans are developed according the legislation requirements and take into account the maximum possible volumes of oil spilled (Government of Russia 2002). Since oil spills are classified depending on the volume of oil spilled, contingency plans are made for combating spills on different levels (federal, regional, local) and are enacted depending on the category of the oil spill.

Inter alia, the oil spill contingency plans provide an algorithm of actions and coordination to be taken during an emergency response operation and thus are meant to facilitate preparedness. EMERCOM has set the general requirements and endorsement procedures for the plans (Order 621, 2004).

The contingency plans are established at the federal, regional and local levels (Government of Russia 2002). Contingency plans at regional (federation subject) and facility levels are developed by operators, and then confirmed by regional and responsible federal authorities in the region and approved by EMERCOM. At the federal level oil-spill contingency plans at sea are elaborated by MorSpasSluzhba. These are to be approved by federal authorities, including EMERCOM and the Ministry of Natural Resources and Ecology.

Resolution 1189 stipulates a mandatory structure and content of an OSR plan for offshore facilities and operations. The OSR plan shall contain, apart from the pure technical information on oil spill characteristics and OSR strategies:

- Information on procedure for notification of authorities and other parties of interest in case of an acute oil spill,

- List of actions for potential oil spill prevention and mitigation measures,
- Financial and material-technical reserves of the operator,
- Safety measures,
- Organizing the monitoring of oil spill situations and environment,
- General information on OSR techniques,
- Organisation structure of oil spill response with managerial roles,
- Rehabilitation of polluted areas, reporting costs associated with OSR, and other information as stipulated by normative requirements of the Russian legislation, etc.

Companies engaging in petroleum exploration, production, processing and transportation are also obliged to ensure oil spill response either via their dedicated divisions or through external certified contractors (Government of Russia, 2002). According to Russian legislation, all oil companies must have oil spill contingency plans specifying oil spill response measures. They must have oil spill response resources available in exploration, production, processing and transportation zones. The Russian government aims to contain an offshore oil spill within 4 hours of it being discovered.

Oil organizations are obligated to have standby funds and material resources necessary to localize and liquidate oil spills (Resolution 1189, 2004).

To facilitate the availability of such assets, the most organisations have mutual aid agreements, or memorandums of agreement, which are pre-arranged with other industry operators in the region. Such agreements allow for the expedited release of key equipment (surveillance aircraft, firefighting equipment, oil spill response equipment, dispersant stock, etc.) needed to quickly combat a major incident before assets can arrive from outside the region.

#### 1.2.5 Reflections on the operational patterns within oil spill response

The OSR legislation has been developed actively since 2000 and is currently under change. Obligatory warranties of sufficient monetary funds to respond and compensate the environmental damage have been recently set in the legislation, the Maritime Rescue service is being re-organized, the SAR and OSR fleet is renovated. These positive changes have an effect on large incidents. But still the national OSR policy and system in Russia has not been fully developed as it lacks a clearly formulated state policy and a single governing body.

Oil spill response planning for the marine exploration and production wells is based on a maximum possible volume of oil spill, which is prescribed by the Russian regulatory documents: for the marine exploration and production wells – absolutely independently of the type, design, preventive measures adopted, etc. – the decree prescribes planning of oil spill response based on the max flow rate from the well and duration of such blowout which is prescribed to be 3 days.

The idea of a prescribed maximum spill size, although at first sight constructive and simple, in reality leads to unrealistic numbers, absolutely not facility-specific and failing to take into account the most probable duration of spill. In practice, oil spill scenario can be based on instantaneous release with little or no attention to rate and duration of spill, since this issue is not covered by the laws and not required to be assessed.

The current regulations put forward the prescriptive approach to OSR planning. The regulatory authorities lay down the necessary requirements for performance and monitor that the



operators comply with these. An OSR regime based on prescriptive regulations has the advantage of being relatively easy and simple to implement and follow up. At the same time its weakness is that it may not prevent new types of accidents that may appear in the future and it often prevents innovation due to its specific, prescriptive rules and requirements. One of the main disadvantages of a prescriptive regulatory framework is that governmentally imposed levels of required response capability, which are not commensurate with the real risk profile, may result both in lack and in excess of necessary response capability. The Russian operators are not required by law to cooperate on shared use of OSR planning and resources. They can only voluntarily agree to cooperate in case of an oil spill (ENINO, 2014).

An effective incident response requires well-qualified and trained responders working under ICS with a properly developed and resourced incident response plan. Building ICS competency involves a combination of skills acquired through training and experience-based learning from exercises or actual responses. As with any competency, ICS requires a sustained and long-term program to provide practitioners with sufficient time to carry out the number and frequency of training and exercising opportunities required to build and maintain their capabilities.

The OSR system is a structure based on interorganizational interdependencies which may both facilitate cooperative behavior and induce competition. The findings indicate that the formal and informal mechanisms are in fact complementary. The formal coordination defines the roles and functions of the interacting organizations, establishing the operative coordination procedures and patterns of interaction on a daily basis. The informal coordination facilitates the effective functioning of the formal procedures and compensates for its gaps and shortcomings. Interdependence among the actors within the systems is based on a shared commonality of purpose. However, the commercialization of OSR services as a result of federal policy has led to competitive relationships, in particular among response providers (Sydnes, 2011).

The Russian OSR legislation and system itself is currently under change. Some positive changes have not been implemented yet and the national OSR policy and system in Russia has not been fully developed. ICS structures described in the oil spill contingency plans include in most cases only the operations block, and as a consequence, the managerial roles and functions are not fully clear. There is a need for more in-depth analysis of how the incident management systems should function by OSR.

### 1.3 Firefighting

#### 1.3.1 Main institutions in the preparedness value chain

As mentioned above, in the Russian Federation all issues related to emergency prevention and response at land, are organized within the Unified State System of Emergency Prevention and Response / USSoEPR (Federal law 68, 1994). Firefighting at sea is not pointed out as a separate functional system of USSoEPR, it is a part of the functional USSoEPR subsystem to provide assistance to people and vessels in distress at sea, and the USSoEPR system itself.

Responsibility for maritime SAR operations including firefighting is given to the Federal Marine and River Transport Agency (RosMorRechFlot), which reports to the Ministry of Transport. Maritime operations are ensured by RosMorRechFlot via its entities in charge — MorSpasSluzhba (State Maritime Rescue Service) with their regional branches and the Maritime Rescue Coordination Center, with divisions in the regions. The duties of the Rescue

Coordination Center include coordination of actions/assets of marine/river transport. MorSpasSluzhba has vessel and equipment to provide firefighting assistance at sea. The firefighters and rescuers of state and regional fire service can be involved in firefighting operations at sea. EMERCOM has fire vessels and equipment to be used in the coastal zones.

The Northern Expeditionary Unit of rescue and salvage operations ensures navigational safety of fishing vessels and performs firefighting and search and rescue operations in the fishing areas. It reports to the Federal Fishing Agency.

The master of the vessel is solely responsible in all cases for the firefighting and the safety of the passengers and crew. In most cases, the human factor is decisive in the occurrence of fire, and fire prevention should be aimed at strict implementation of organizational measures. All crew members must understand that the fire is easier to prevent than to extinguish. Knowledge of fire safety rules is mandatory for all crew members, monitoring their implementation rests with the entire command of the vessel. The captain of the vessel is liable to the ship owner for implementing the fire prevention regime on the vessel. The following agencies can provide ships for maritime firefighting operations: federal-level marine port administrations, the Federal State Unitary Enterprise RosMorPort (Russian Maritime Port), Ministry for Defense, etc.

### 1.3.2 Organizational model, command systems and external relations

According to the Federal “Fire safety act” of 1994, **the Fire Service** in Russia is divided into:

- state fire service including federal fire service of EMERCOM and fire service of the regions established and financed by regional governments;
- municipal fire divisions established and financed by municipal governments;
- department fire divisions established and financed by federal executive authorities at organizations within their jurisdiction (i.e. by Ministry of Defence at their enterprises and organizations);
- private fire divisions established and financed by enterprises;
- voluntary fire divisions established by regional, municipal and non-governmental organizations and financed from various sources including executive authority budgets of different levels and budgets of the non-governmental organizations.

The functions of the state fire service include conducting prevention, firefighting and SAR, supervising the implementation of the federal, regional, local self-government legislation, technical regulations and other legal acts in the field of fire safety; exercising operational control of other types of fire protection forces and means involved to extinguish fires at facilities that are critical to the national safety of the country; conducting monitoring of the fire safety, preparing proposals for government agencies and local governments to implement measures in the field of fire safety; etc.

Managing authorities within USSoEPR include:

- *federal level* – EMERCOM;
- *inter-regional level* – EMERCOM’s inter-regional offices;
- *regional level* – EMERCOM’s regional offices;

- *municipal level* – dedicated divisions in charge of civil defense and population/area emergency protection, established by local self-government bodies;
- *site/facility level* – divisions of organizations in charge of civil defense and population/area emergency protection.

All missions are coordinated by EMERCOM’s crisis management centers of the federal, interregional or regional level according to the severity of the crisis. Operations control duty desks operated by regions’ executive authorities and emergency organizations have responsibility to coordinate operations on the regional level. Appropriate operations control duty desks of the designated divisions and organizations coordinate missions on the municipal and site/facility level.

The emergency response and fire safety commissions play a central role in the SAR system. They function primarily as coordinating bodies for USSoEPR at different levels. Their primary function is to mobilize, organize and bring together all available resources and organizations necessary for successful emergency response operations. During an emergency, a response group can be created within the commission. As mentioned above, the response group provides the emergency scale and emergency development assessment, organizes and manages the response, and coordinates and controls the activities and interaction of the involved organizations.

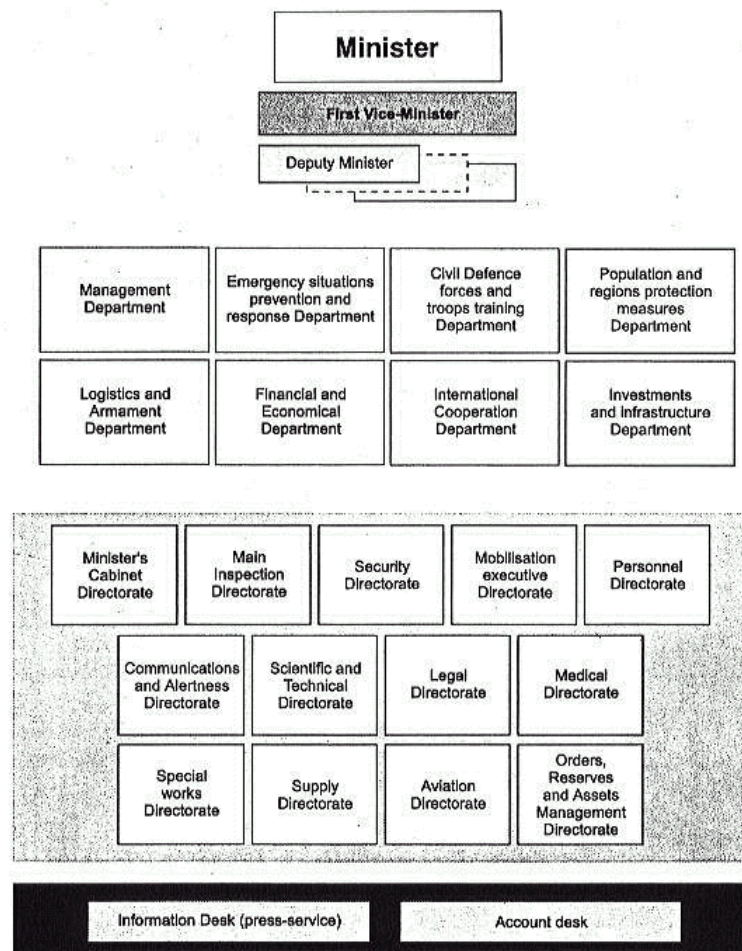


FIGURE 38. STRUCTURE OF EMERCOM. SOURCE: [HTTP://EN.MCHS.RU/MINISTRY/STRUCTURE](http://en.mchs.ru/ministry/structure)

Assets and resources of the fire service are divided into three levels:

1. Assets and resources owned by EMERCOM
  - firefighting service divisions;
  - civil defense divisions;
  - EMERCOM's other units and organizations.
2. Assets and resources owned by Russian ministries and departments:
  - resources and facilities of Ministry of Defense, Ministry of Transport, Ministry of Internal Affairs, Ministry of Public Health, Federal Service for Hydrometeorology and Environmental Monitoring (RosHydroMet), etc.
3. Assets and resources owned by Russian regions, municipalities and organizations.

In many Russian regions, fire safety assurance is regulated by special agreements. For instance, the agreement between the EMERCOM's Main Office for Arkhangelsk Region and the Administration of Arkhangelsk Region stipulates that the firefighting duties are the responsibility of EMERCOM. When a severe fire is handled jointly by fire brigades other than EMERCOM's, the coordination of such fire brigades is the responsibility of the Federal Fire Service. Municipalities, in their turn, are responsible, as stated in the legislation, for voluntary fire unit's formation, all-the-year-round water intake and availability of basic firefighting means to public institutions. If, on the territory of the municipality, there are no Federal Fire Service departments and units, the heads of the regional or other types of the fire divisions are appointed as heads of the local fire service garrisons. To coordinate the activities of the various fire services, the fire service garrisons are established:

- regional fire service garrisons on the territories of the Russian Federation;
- local fire service garrisons on the territory of every municipality.

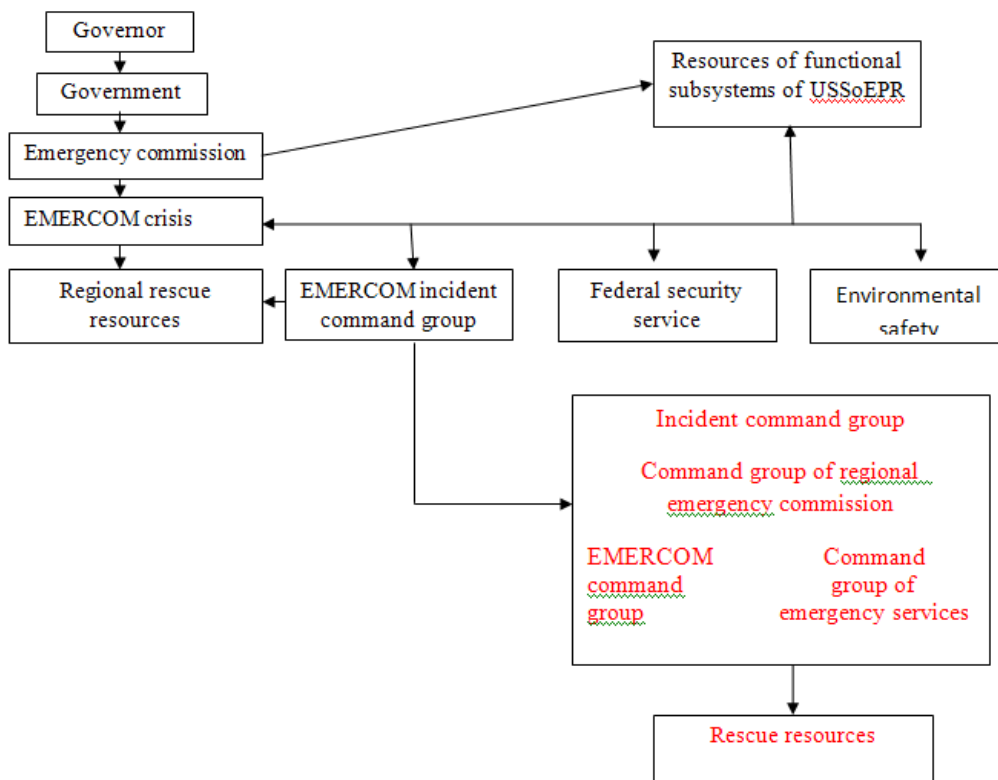
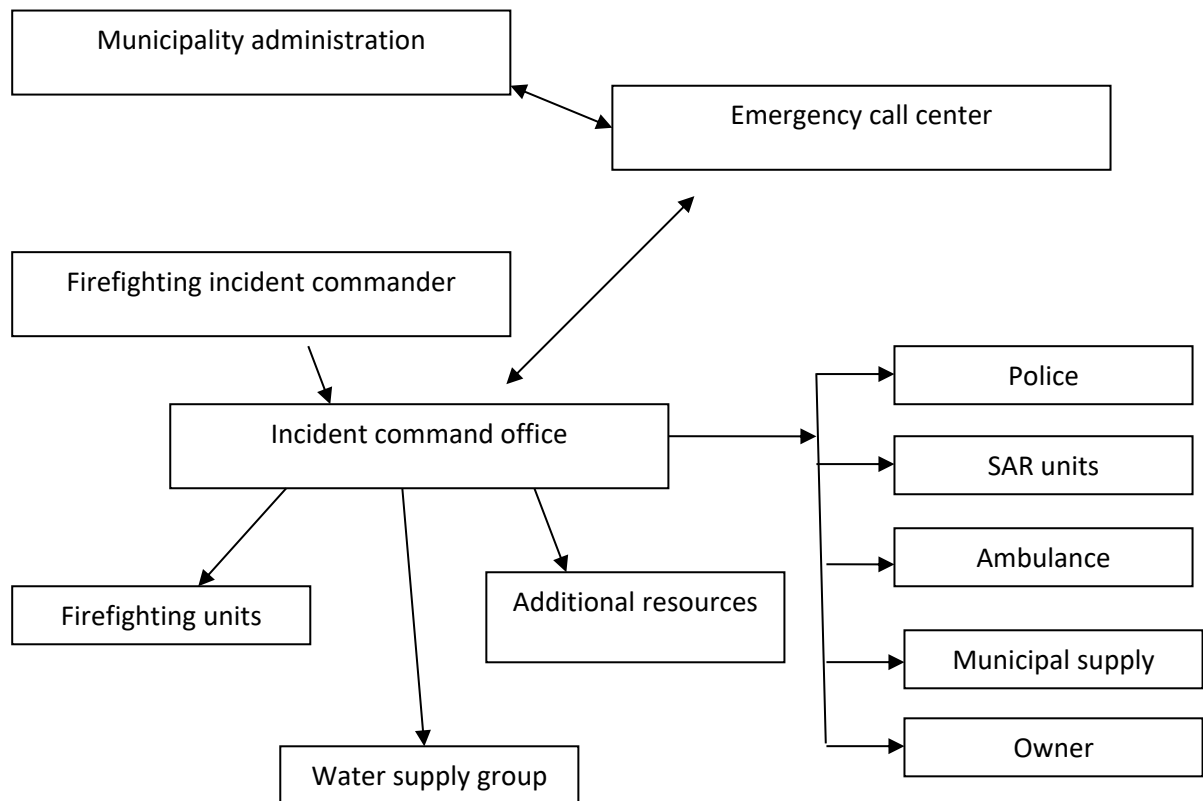


FIGURE 39. INCIDENT COMMAND SYSTEM IN (RED) IN THE ARKHANGELSK REGION



**FIGURE 40. MANAGEMENT AND COORDINATION OF THE UNITS THROUGH THE INCIDENT COMMAND OFFICE WHILE FIREFIGHTING (VERSILIN M., POVSIK J. “FIRE TACTICS”).**

The heads of the regional fire service garrisons are the heads of the main EMERCOM Offices in the region. The heads of the local fire service garrisons are the heads of the Federal Fire Service departments located on the territory of the municipality, or a specialist of the State Fire Inspectorate qualified to coordinate and manage firefighting operations. The Russian Federation maritime SAR operations system, as a subsystem of USSoEPR, is based on cooperation between different ministries, agencies and services (Resolution 834, 1995). Maritime operations, including firefighting, are ensured by RosMorRechFlot of **Ministry of transport** via its entities in charge — MorSpasSluzhba (State Maritime Rescue Service) with the branches in the regions and the Maritime Rescue Coordination Center, with divisions in the different regions.

The duties of MorSpasSluzhba include the operative management of federal scale emergency response on marine and river transport. The maritime SAR resources and equipment are owned by ten MorSpasSluzhba branches of Russian regions. In compliance with the International Convention on Maritime Search and Rescue at Sea, 1979, and the International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual, MRCCs and MRCSs have equipment designed to operate in harsh Arctic conditions.

In marine basins, the responsibility for deployment and coordination of SAR assets lies with the rescue coordination center based in Moscow, and rescue coordination centers and sub-centers in the regions. Currently there are 7 Maritime Rescue Coordination Centers (MRCCs) in Murmansk, St. Petersburg, Kaliningrad, Novorossiysk, Astrakhan, Vladivostok, Dikson and 8 Maritime Rescue Sub Centers (MRCSs) in Arkhangelsk, Yuzhno-Sakhalinsk, Petropavlovsk-

Kamchatsky, Taman, Tiksi, Pevek, Sevastopol, Kerch (skc.morflot.ru). MRCC and MRCS use the same coordination patterns for firefighting and SAR operations which are described above.

Naval Fleet, which is part of the **Ministry of Defense**, can participate in firefighting at sea in the Arctic. In particular, the rescue group for SAR operations management of the Northern Fleet is responsible for carrying out SAR operations including firefighting in the Arctic waters. The SAR department of the Northern Fleet includes two SAR divisions in Severomorsk and in Severodvinsk. The SAR units and subdivisions of the Army 45 of the Space-air Forces are designed to organize and provide SAR for aircrafts in distress.

According to the Merchant Shipping Code, the **Federal Fishing Agency** is responsible for safe shipping of the fishing fleet around the fishing areas. The Federal Fishing Agency reports to the Ministry of Agriculture. Since 2013, the functions to ensure shipping safety of the fishing fleet and to respond to emergency situations have been assigned to the Far Eastern Expeditionary Unit of rescue and salvage operations and Northern Expeditionary Unit of rescue and salvage operations (<http://www.seoasr.ru/RescueFleet/rf>). Main activities of the Expeditionary Units of rescue and salvage operations are to ensure navigational safety of fishing vessels and to perform SAR operations and firefighting in the fishing areas.

Medical rescue of people in distress at sea is organized by the center for disaster medicine, which is responsible to the **Ministry of Health** of the Russian Federation. Ministry of Health is in charge of developing methodology for coordinating activities of the center for disaster medicine. The head of the regional center for disaster medicine takes charge of the medical part of a SAR operation and is directly responsible to the head of the regional committee of prevention and response to emergency situations. To provide medical aid to people in distress at sea, the center for disaster medicine is included in the structure of the Ministry of Health and comprises from:

- at federal level: federal state establishment “Russian center for disaster medicine
- at regional level: regional centers or branch offices of the center for disaster medicine.

The ship owner is responsible for the fire safety on their vessels however the captain of the vessel is responsible for the fire safety during the vessel’s operations and navigation. There should be a Chief Officer responsible for fire safety on every vessel, and responsibilities to the other crew members are allocated depending on their position. For example, the chief engineer is responsible for monitoring the situation and fire prevention in the engine room. The Chief Officer is responsible for the crew’s ability to fight fires. An assistant or the chief mate is required to instruct new crew members on the fire prevention regime aboard the vessel.

Knowledge and competence of the ship's crew is very important for rapid response, because the way vessels are designed enables the fire to spread rapidly to the compartments and cabins. In every room of the vessel there are stationary fire-extinguishing systems that meet certain requirements. All crew members should know their duties, roles and procedures in case of a fire. Regular training should be provided for the crew. Special groups for emergencies are also created within the vessel crew. The groups will be responsible for managing fires, flooding, and failure of technical equipment to ensure the survivability of the vessel.

### 1.3.3 Operational hierarchy and management responsibilities

#### **Strategic level**

According to the legislation, coordination of SAR activities including firefighting at sea and at landlocked seas is assigned to EMERCOM. As mentioned above, the federal government commission for prevention and response to emergencies coordinates the ministries' and involved organizations' activities in order to ensure the unified state policy in SAR at sea and at landlocked seas. The head of the commission is the minister of EMERCOM. Depending on the scale of the emergency, the interregional, regional, or municipal emergency commissions can take over the coordination.

During an emergency, the emergency commissions can transform its structure, and an incident command group can be created within the commission. The incident command group determines the scale of the emergency and assesses the development, organizes and manages the response, coordinates and controls the activities and interaction of the involved entities. It can also be responsible for communicating with media.

The Ministry of Transport is in charge for the organization of all activities related to firefighting and SAR at sea and the coordination of all involved actors via MRCC and MRCS. The disaster medicine departments are responsible for providing plans and activities to evacuate and render medical assistance to the injured.

The ship owner or the company can support on a strategic level. They may and should offer their assistance in providing health care support, personnel, media and next of kin communication, reception and follow-up arrangements for evacuated passengers and employees. The ship owner should work with the MRCC to receive information on the condition and location of the passengers and personnel as well as on the established reception point. The ship owner or the operating company is responsible for preparing emergency response plans for the vessel. The company should clearly define and document the master's responsibility with regard to implementing the safety and environmental protection policy of the company. In situations where the emergency on board the vessel develops relatively slowly or is at its early stages, the master and the crew will generally lead the response. The master should alert relevant authorities about the emergency situation, so that they can start preparations in case the situation evolves. The master or the ship owner can request some assistance, but the overall coordination is handled by the master while the situation is under control. If the emergency evolves to the point where the ship owner and the ship crew cannot handle it, the coordination will be passed to the MRCC and the relevant response authorities onshore.

Depending on the scale and type of an incident, the strategic level in firefighting emergencies would also include insurance and salvage companies, port and maritime authorities, regional or municipality representatives, federal government committees, military, and other relevant agencies.

#### **Operational level**

The person in charge of the operational coordination during maritime incidents is the Search and Rescue Mission Coordinator (SMC) on duty at the time in MRCC or MRCS in accordance with the shift schedule. The SMC determines which emergency phase is at hand. The SMC is responsible for coordinating searches for and rescue of persons in distress at sea. In most cases, the SMC is also responsible for media relations.

The firefighting incident commander, the senior EMERCOM officer at the emergency site, is in charge of coordinating units according to the principle of one-man management. The firefighting incident commander is responsible for firefighting coordination and safety of units involved in firefighting, for managing resources and personnel on scene, and creating an incident action plan. The commander needs to assess the situation, up-scale the situation if necessary, set the borders of the emergency site, decide upon the appropriate actions, remove any persons or property if there is a significant safety hazard, and engage with additional resources. The commander coordinates the actions of the firefighting units, their locations at the emergency site, organizes the radio communication, and other relevant tasks.

A situation room is organized if the fire has a higher danger class, if more than 3 units are involved in firefighting, or if it is necessary to provide detailed concurrence of firefighting and SAR actions with the municipality administration. The firefighting incident commander’s assistant is in charge of the situation room. The following specialists can be called in to the situation room: the situation room commander’s assistants, a person responsible of the breathing apparatus checkpoints, a labor protection specialist, enterprise representatives, and others. The main tasks of the situation room are to provide the collection and analysis of an emergency situation, to determine necessary resources and backups, control all actions, organize firefighting, make documentation and plans of units location at the emergency site, provide communication, and organize interaction with other emergency services.

Most fire departments will operate within a pre-planned incident command system, designed to break the responsibilities into key functions. The fire department’s overall command will be sub-divided into logistical support, operational duties, liaison, financial, and so on.

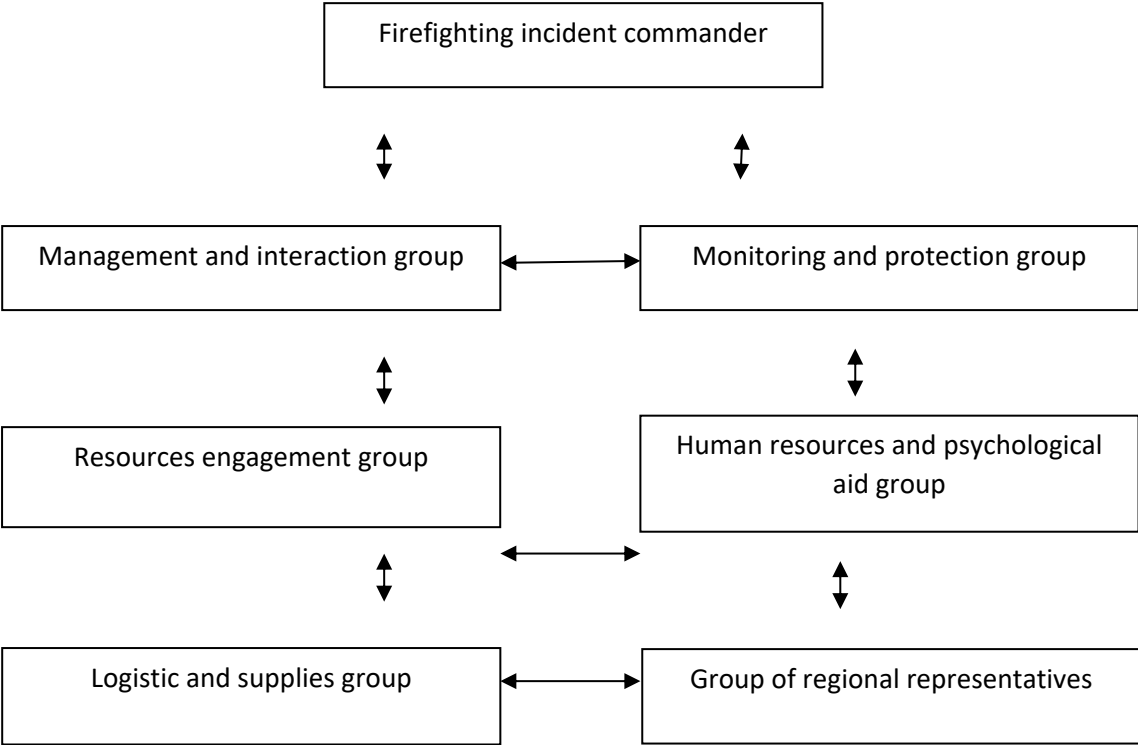


FIGURE 41. SITUATION ROOM STRUCTURE OF THE EMERCOM REGIONAL DIRECTORATE



## Tactical level

When the vessel is under way (not moored, not anchored, and not aground) and there is a fire on board the vessel, the master has full responsibility on board his/her vessel.

1. If any crew member detects smoke or fire on the board, he/she must immediately report to the duty officer. The duty officer must immediately inform the master.
2. The master will turn on the general alarm (if the fire detectors did not switch on fire alarms already). If the fire detectors activate the fire alarms and the general alarm turns on, the master will go to the bridge and find out the location of the fire from the Panel of Fire Alarm System (where the detector activated). Simultaneously, the master announces fire drill and he/she is responsible for general coordination.
3. The crew follows the vessel's procedures from the muster list (a muster list is basically a list, which is displayed around prominent areas of the vessel so that every crew member on onboard can read it on a go):
  - The crew assembles on the muster station and follows the master's commands. Responsible officer is in charge of the operational level. He provides communication between the master and the emergency team.
  - The master announces the location of the fire and records all information in the deck logbook (bell book).
  - Emergency team puts on firefighting outfits and after reporting to the master about emergency preparedness, follows the procedures\instructions.
  - Chief Engineer goes to ECR for switching off ventilation and switching on fire pumps, all fire flaps are closed by responsible persons, isolation of compartments is also conducted by a dedicated person (according to the muster list).
  - When the emergency team reaches the fire, they report whether the fire can be tackled with fire extinguishers or fire lineю
  - If their efforts are not successful, the master commands to use CO2 system if it is provided in this area (CO2 fixed firefighting system is the last resort available on-board ships for fighting major engine room or compartment space fires. The requirement for CO2 fire extinguishing is to discharge 85% of CO2 gas in the fire affected space within 2 minutes in the engine room and 10 minutes in the cargo holds. This means that there is no time to refer to the manuals or understand the CO2 system during emergency situations).
  - If the fire cannot be tackled by the vessel crew, the master sends a distress signal: if the vessel is in VHF zone signal transmitted via VHF to the nearest MRCC or MRCS, if the vessel is out of the range of VHF distress signal can be send through MF\HF or by COSPAS-SARSAT or INMARSAT.
  - If the fire threatens life of the crew, the master must evacuate the crew according to evacuation procedures. The priority is always with the crew, then the vessel, and last on the cargo.

A ship crew must be prepared to tackle and fight against any kind of emergencies, which can arise due to reasons such as rough weather, machinery malfunction, pirate attack, human error, etc. Such emergencies can lead to fire, collision, flooding, grounding, environmental pollution, and loss of life. To stress the importance of training for different emergency procedures and duties of personnel, muster list is provided onboard ship.

The functions of the crew members during firefighting:

**FIGURE 42. THE FUNCTIONS OF THE CREW MEMBERS DURING FIREFIGHTING**

<b>RANK</b>	<b>FIRE FIGHTING DUTIES</b>	<b>RESCUE FROM ENCLOSED SPACES</b>
<b>MASTER</b>  Substitute: Chief Officer	In command of ALL operations.  Establish contact with the vessel owner Contingency team, MRCC and ships in vicinity.	In command of ALL operations.  Activate the general alarm to alert the Crew.  Inform about the location of rescue operations.
<b>CHIEF OFFICER</b>  Substitute: 2 <sup>nd</sup> OFFICER	Squad leader.  Muster at Aft Muster Station.  Check presence of crew members.  Establish contact with the Bridge by VHF. Keep Master informed about status of personnel and situationю	In charge of rescue operations according to location.  In charge of counting the Crew and detecting who is missing. In charge of checking the level of CO <sub>2</sub> , combustible gases and oxygen. Keeping the master well informed and updated on the real situation and results from actions taken.
<b>2<sup>nd</sup> OFFICER</b>	Muster at Aft Muster Station.  Assist the A/B and M/M. Prepare additional firefighting equipment.	Assist AB x and/or Motorman to correctly wear BA.  Establish radio communication on scene.  In charge of bringing the oxygen medical set and mask.
<b>CHIEF ENGINEER</b>  Substitute : MOTORMAN	Muster at Aft Muster Station. Proceed to Engine Control Room. Establish contact with the bridge. Switch Off power supply and ventilation to incident area. Release CO <sub>2</sub> according to master's order.	In charge to bring an appropriate equipment to provide an adequate lighting and ventilation in rescue area.
<b>AB 1</b>	Muster at Aft Muster Station. Fireman # 1. Put on firefighting outfit and breathing apparatus. Rig firefighting equipment according to Chief officer's order.	In charge to bring the EEBD, safety harness, blocks and lifelines. Technical support.
<b>AB 2</b>	Muster at Aft Muster Station. Prepares fire hoses, extinguishers, and spare air bottles. Start emergency fire pump after Chief Officer's order.	Member of the rescue team with BA.

<b>MOTORMAN</b>	Muster at Aft Muster Station. Fireman # 2. Put on firefighting outfit and breathing apparatus. Rig firefighting equipment according to Chief Officer's order	Member of the rescue team with BA.
<b>OS/COOK</b>	Muster at Aft Muster Station. Medical team. Close down ventilation and doors to incident area, engine room and living quarters. Prepares fire hoses, extinguishers, and spare air bottles. Perform first aid assistance.	In charge to bring the stretchers, blankets, medical first aid kit.  Stand-by by the entrance of the enclosed space.

The response activities of the relevant emergency services on scene are similar to the SAR response (see above).

#### 1.3.4 Plans and standard procedures presenting the main action patterns

The firefighting resources are organized by appropriate federal, regional, and municipal plans and response procedures within the territory of the regions. The EMERCOM directorate in their respective region establishes the response plans according to the situation describing the types of risks, relevant resources and incident command systems. On board all vessels, there are muster lists, which are basically lists displayed in prominent areas of the vessel so that every crew member on on-board can read them on a go. The important features displayed on the muster lists are:

- types of emergency and the appropriate alarms. Main emergencies like fire, man overboard, abandon ship, oil spill etc. are listed along with dedicated visual and audible alarms;
- instructions that can be followed according to the different emergency types. Brief instruction is given in case the alarm for a particular emergency is activated, which includes action to be taken by the crew onboard;
- common muster point for all the crew. The common muster point is clearly described if any emergency alarm is activated. Normally, the lifeboat deck area is made as a common muster point;
- different teams with assigned duties for the individuals;
- ship specification and emergency communication equipment. Ship specifications are displayed along with the communication methods and equipment to be used in a case of emergency;
- special and general instruction for the master. A separate section for general and special instructions is provided, which is used by the master or the chief engineer of the vessel in order to instruct the crew.

The muster list is established in order to keep the crew aware of the different emergency situations and duties to be performed, if such situations occur in reality. For this, regular training and drill must be conducted by the master of the ship to ensure that all crew members are familiar with lifesaving and firefighting appliances. According to the SOLAS requirements, fire drill must be carried out monthly.

### 1.3.5 Reflections on the operational patterns of firefighting at sea

A professional response to put out fires at sea demands a great deal of preplanning by the fire service to set up an emergency response team for offshore work. It is not straightforward to set up a team for firefighting on board vessels, select suitable personnel, and training the personnel not just for firefighting on board vessels, but also helicopter operations and sea survival. Safe access and escape routes, together with the risks on board, are main concerns in this case.

Shore based firefighters offer some obvious advantages over a ship's crew, namely a greater understanding and experience of fire and dealing with hazardous materials. A professional firefighting team trains very regularly, in some cases every day, and regularly performs exercises, which demand the mobilization of a large amount of resources. However, all analyzed plans and procedures of the Russian fire service have requirements for firefighting at land. Incident command systems are provided to fight fires in buildings or on board the vessels in ports, but not in open sea.

Another problem is the communication between the aircraft and the vessel. According to the legislation of the Russian Federation, aircrafts and seagoing vessels use different frequency bands and cannot communicate directly. Therefore, the communication between the rescue helicopter and the vessel in distress is provided following the chain «vessel in distress — rescue coordination center — air traffic authorities — aircraft/helicopter» and backwards. Emergency information transfer through this chain is very complicated, takes much time and does not meet the requirements of the 1979 SAR Convention.

The incident command system of USSoEPR has various levels – federal, regional, municipal, etc. with different command authorities – which can be challenging for coordination in large scale rescue operations. A fire on board a vessel is one of the most dangerous threats. Early notification is essential in order for the shore-based service to assess the situation and plan a safe approach. The reluctance to call early for help, whatever the reason, be it company policy, salvage claims or just lack of understanding of what is available, may result in serious delays, which will affect the success of the operation.

## 1.4 Violent action situation and counterterrorism

### 1.4.1 Main institutions in the preparedness value chain

The main institutions in the preparedness value chain for violent action situation and counterterrorism are part of the quite isolated institutional framework of the whole emergency preparedness sector. Institutional relations are regulated by a set of rules, legal principles and legal regimes.

The state management in the Arctic region of the Russian Federation is carried out by public authorities (state bodies) for the implementation of embodied state functions, providing 5 (five) national legal regimes in the Arctic:

- 1) “Emergency regime”;
- 2) “Martial law regime”;
- 3) “Frontier regime”;
- 4) “Mobilization”;
- 5) “Seaports regime”.

### *“Emergency regime”*

The Federal Constitutional Law of May 30, 2001 No. 3-FKZ “On State of Emergency”, setting the circumstances of the emergency regime, defines a two-step procedure for its legitimization:

- 1) an adoption of the presidential decree on the introduction of state of emergency;
- 2) an adoption of the resolution by the Council of Federation of the Federal Assembly of the Russian Federation on the approval of the presidential decree.

### *“Martial law regime”*

The declaration and imposition of martial law regime is based on a presidential decree. Federal Constitutional Law of January 30, 2002 No. 1-FKZ “On Martial Law Regime” in contrast to the Law “On State of Emergency” prescribes to address the presidential decree to the both chambers of the Federal Assembly.

However, the presidential decree is approved by the resolution of the Council of Federation. The State Duma only needs to be informed of the imposition of martial law.

### *“Frontier regime”*

“Frontier regime” is directly established by the Article 16 of the Law of the Russian Federation of April 1, 1993 No. 4730-I “On the National Frontier of the Russian Federation”.

### *“Mobilization”*

Mobilization as a legal institution mediates a significant range of public relations and includes norms of various branches of law.

The standard regime was established in the Federal Law of February 26, 1997 No. 31-FZ “On mobilization training and mobilization in the Russian Federation”, which is a key act of determining the content and the basic rules of the regime.

The Rules of “mobilization” contains a large number of legislative acts (eleven normative legal acts) including federal constitutional laws and federal laws<sup>5</sup>. In addition, there is a large number of by-laws and rules specifying these above-mentioned laws.

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<sup>5</sup> *Federal Constitutional Laws*: Federal Constitutional Law of December 17, 1997 No. 2-FKZ “On the Government of the Russian Federation” (see: Article 114(2) of the Constitution of the Russian Federation); Federal Constitutional Law of January 30, 2002 No. 1 FKZ “On Martial Law Regime” (see: Article 87(3) of the Constitution of the Russian Federation); Federal Constitutional Law of May 30, 2001 No. 3-FKZ “On State of Emergency” (see: Article 56 (1 and 2) of the Constitution of the Russian Federation);

*Federal Laws*: Federal Law of December 13, 1994 No. 60-FZ “On the Supply of Production for Federal State Purposes”; Federal Law of December 29, 1994 No. 79-FZ “On the State Material Reserve”; Federal Law of July 15, 1995 No. 101-FZ “On International Treaties of the Russian Federation”; Federal Law of May 31, 1996 No. 61-FZ “On Defence”; Federal Law of February 12, 1998 No. 28-FZ “On Civil Defence”; Federal Law of June 19, 1998 No. 14-FZ “On the Military-Technical Cooperation of the Russian Federation with Foreign States”; Federal Law of October 06, 1999 No. 184-FZ “On General Principles of Organization of Legislative (Representative) and Executive Bodies of State Power of Subjects of the Russian Federation” (note: “Subjects” means “Regions of

### *“Seaports regime”*

Federal Law of 31 July 1998, No. 155-FZ “On the Internal Waters, Territorial Sea and Contiguous Zone of the Russian Federation”, other federal laws and other normative legal acts of the Russian Federation applicable to sea ports, establishes the “seaports regime” of the Russian Federation taking into account the climatic, hydrological, meteorological and other peculiar properties (NB: Russia is a member-state of the United Nations Law of the Sea Convention 1982 (from March 02, 1997)).

The above-mentioned regimes characterized by the special importance of the regulated social relations and the use of legal means, provide a regime of restriction of the rights of citizens and organizations. Hence, all of the legal regimes in the Arctic region have several common features:

- a normative legislative determination;
- the legal norms of different branches, characterized by strict and detailed regulative environment;
- a variety of territories with different legal regimes depending on legal norms;
- specially established state governmental bodies with a list of competences.

The main institutions in the system of counterterrorism include the president of the Russian Federation, the Government of the Russian Federation, the Federal Antiterrorism Committee, the Federal Security Service (FSB) including the Federal Border Service, the Ministry of Defense, the Foreign Intelligence Service, Regional Executive Authorities, and the Armed Forces.

#### 1.4.2 Organizational model, command systems and external relations

The issues of Arctic governance and the establishment of a special administrative-legal regime in the Arctic zone is complicated by the existence of “composite subjects (regions)” of the Russian Federation. In particular, according to the Presidential decree of May 2, 2014 No. 269 “On the Land Territory of the Russian Arctic” Nenets Autonomous Okrug (District), Chukotka Autonomous Okrug (District), Yamalo-Nenets Autonomous Okrug (District) are part of the “Arctic zone” of the Russian Federation. At the same time, in contrast to Chukotka Autonomous Okrug, Nenets and Yamalo-Nenets Autonomous Okrug are part of the other subjects of the Russian Federation, respectively, Arkhangelsk Oblast’ (Region) and Tyumen Oblast’ (Region).

**The president of the Russian Federation** determines principles of state policy within counterterrorism and the scope of authority of the federal executive bodies, whose activities are directed by the president.

**The Government of the Russian Federation** determines the scope of competence of the federal executive bodies within counteraction against terrorism. The functions of the federal government also include developing and implementing measures to prevent terrorism, to reduce and (or) eliminate consequences of terrorist acts as well as coordinating federal,

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the Federation”); Federal Law of October 06, 2003 No. 131-FZ “On General Principles of Local Self-Government in the Russian Federation” etc.

regional and local authorities' efforts aiming to counteract terrorism (with required forces, facilities and resources) (Decree 116, 2006).

**The Federal Antiterrorism Committee** is a body tasked with coordination and organization of counterterrorism activities of governmental bodies at the federal level, at the regional level and of local governments. The Chairman of the Committee is the director of the Federal Security Service (FSB). Regional Antiterrorism committees are chaired by the governor. The head of the regional FSB division is the deputy chairman. The functions of the Antiterrorism Committee include the development of policy and recommendations on counteraction against terrorism, collection and analysis of data/information, coordination of activities of federal executive bodies on counteraction against terrorism, contribution to the improvement of national legislation for counteraction against terrorism, and so on.

**The Federal Security Service (FSB)** ([www.government.ru/en/department/113/](http://www.government.ru/en/department/113/)) is a federal executive body with the authority to implement government policy in the spheres of national security, counterterrorism, protection and defence of the state border, and protection of internal waters, the territorial sea, the exclusive economic zone, the continental shelf and their natural resources. FSB coordinates the counterintelligence efforts of the federal executive bodies that are included in the Counterterrorism system. The President oversees the activity of FSB. The Federal Operational Headquarters, subordinate to the director of the FSB, and Operational Headquarters in the regions, led by the heads of regional FSB divisions, implement activities to plan and control counterterrorism operations where the use of counterterrorist forces and resources are required. FSB has special services (division like "Vypel", "Alpha", etc.) to carry out counteraction against terrorism.

The Federal Border Service is a part of the FSB. Alongside state authorities, this service carries out counteraction against terrorism by preventing, detecting and thwarting terrorists and other trying to cross the state border. The Federal Border Service also counters illegal movement of weapons, explosives, poisonous and radioactive substances that can be used in acts of terrorism. The border guards secure national maritime traffic in Russia's territorial waters and exclusive economic zone and participate in counterterrorism operations at sea and on land.

**The Ministry of Defense** analyzes the information on the current status of international terrorism, its dynamics and escalation trends, formulates suggestions on developing cooperation in combating terrorism, takes part in developing effective counterterrorism system in line with the current tactical situation and terrorism development trends, coordinates joint efforts to prevent terrorism attacks on nuclear sites or attacks involving weapons of mass destruction, and so on. The ministry provides protection using weapons of mass destruction, missiles and small armaments, ammunition and explosives, and protection of military facilities. The Ministry of Defense also takes part in securing the national maritime zones and airspace of the Russian Federation and in counterterrorist operations ([www.eng.mil.ru](http://www.eng.mil.ru)).

The Foreign Intelligence Service and subordinate bodies of the Foreign Intelligence Service carry out counteraction against terrorism outside the territory of the Russian Federation. They

also collect data/information on the activities of foreign and international terrorist organizations.

**Regional Executive Authorities** organize the implementation of state policy on counterterrorism in Russia's regions and coordinate the activities of state authorities on prevention of terrorism, as well as minimize and eliminate the consequences of its manifestations. The regional governments take steps to organize development and implementation of measures, as well as regional governmental programs in counterterrorism in order to minimize and eliminate its consequences. Their duties also include monitoring socio-political, socio-economic and other processes in order to address preconditions for conflicts, reasons of terrorist acts and formation of social basis of terrorism. In case of a terrorist attack, they organize the provision of medical and other assistance for victims.

### **Armed Forces**

In counteraction against terrorism the Armed Forces of the Russian Federation may be engaged to suppress acts of terrorism in the internal waters and the territorial sea, and to ensure safety of national maritime traffic. The Armed Forces also work to prevent international terrorism outside the Russian Federation.

Using the Armed Forces to fight terrorism, requires a decision from the President of the Russian Federation. A decision to use the Armed Forces of the Russian Federation against terrorists and (or) their centers, which are located abroad must also be made by the President.

A decision to use formations/troops of the Armed Forces outside the Russian Federation for accomplishing tasks aimed at suppressing international terrorist activities must be made by the President on the basis of the appropriate decision of the Federation Council of the Federal Assembly. The President determines the total strength of formations of the Armed Forces, areas of their operations, tasks set for them, and the time period for their staying outside the Russian Federation.

The Armed Forces of the Russian Federation shall use weapons and military equipment in its actions to remove a threat/alert of an act of terrorism in internal waters, in the territorial sea, on the continental shelf and to ensure the safety national maritime traffic (also under water) or for the purpose of suppressing terrorist acts.

When vessels do not respond to commands to stop their violation of the rules for use of water (under water) areas of the Russian Federation or refuse to obey demands to stop, military ships or aircrafts may use the weapons at their disposal to force the ships to stop and to remove any threat of a terrorism act. If a ship does not obey demands to stop and all measures to force the ship to a halt have been exhausted and there is a threat to human lives or to the environment, the military ships or aircrafts shall prevent further movements of the ship by destroying it.



### 1.4.3 Operational hierarchy and management responsibilities

#### *The role of the Frontier Service of the Federal Security Service*

The basic principle of counter terrorism is connected to unified goals and objectives of all state institutions under the supervision of the Frontier Service of the Federal Security Service (FSS).

The Analysis of the current situation in the Arkhangelsk Oblast' (Region) and Nenets Autonomous Okrug (District) allows to allocate five major challenges for the activities aimed at prevention of acts of unlawful interference:

- 1) *adverse weather and climatic conditions* of the Arctic, complicating the redeployment of anti-terrorist forces from the main places of stationing, and carrying out special operations;
- 2) *substantial removal of the vast majority of potentially dangerous objects* located in the Arctic zone of Russia, from the places of permanent deployment of special units of the security forces (FSS, the Ministry of Internal Affairs, the Ministry of Defence);
- 3) *insufficient load capacity of airports and airfields* located in the Russian Arctic zone, which makes it impossible to use large-capacity aircrafts;
- 4) *lack of firearms in private security personnel* operating in the Arctic zone of Russia, which does not allow at the initial stage to organize the effective combating and countering terrorist and other threats;
- 5) *the ability to access into the staff of potentially dangerous objects* by individuals hatching wrongful intent to commit acts of unlawful interference.

#### *a. "Prirazlomnaya Offshore Platform Case"*

It should be noted that the "security flaws" in the Arctic region have allowed international environmental organization "Greenpeace" to implement in 2012 and 2013 provocative actions against offshore ice-resistant stationary platform "Prirazlomnaya" in the Barents Sea. These circumstances gave rise to the leadership of "Greenpeace" declaring Russia's failure to ensure the security of oil and gas platforms in the Arctic.

However, realization of provisions of the Federal Law of February 09, 2007 No. 16-FZ "On Transport Security" and the Federal Law of July 21, 2011 No. 256-FZ "On the Safety of the Fuel and Energy Complex" by organizations located in the Arctic zone of Russia, has not yet been completed, and separate companies ignore these requirements.

The responsibility in accordance with the current legislation of the Russian Federation may occur after the categorization of objects of transport, fuel and energy complex (FEC), taking into account the application of serious harm to human health or causing major damage (Article 217.1 "Violation of safety requirements and anti-terrorism protection of objects of fuel energy complex", Article 263.1 "Violation of transport security requirements" of the Criminal Code of the Russian Federation).

Otherwise, even for the systematic avoidance of the requirements of the federal laws, enterprises could only be brought to administrative responsibility of regulatory authorities.

Nevertheless, at the present stage, the main tool forcing enterprises to fulfill the requirements of regulatory documents in the field of security is the adoption by courts of "interim measures" for the implementation of the requirements of the federal laws and governmental resolutions.

*b. "Arctic Frontier Service" in the Western Arctic Area*

Currently, the protection of the border of the Arkhangelsk and Murmansk Oblast' (Regions), Nenets Autonomous Okrug (District) etc. is implement by the Frontier Service of the FSS in the Western Arctic Area (hereinafter – Arctic Frontier Service) including the zone:

- from the Norwegian-Russian frontier to Taimyr Peninsula (Krasnoyarsk Krai (Territory));
- the western sector of the Northern Sea Route,
- 15 (fifteen) seaports: 1) Amderma; 2) Arkhangelsk; 3) Belomorsk; 4) Varandey; 5) Dickson; 6) Dudinka; 7) Kandalaksha; 8) Mezen; 9) Murmansk; 10) Naryan-Mar; 11) Igarka; 12) Onega; 13) Khatanga; 14) Vitino; 15) Sabetta.

The coastline stretches over 10,500 km.

The area of responsibility also includes the internal waters, territorial sea, exclusive economic zone and continental shelf of the Russian Federation in the Barents, White and Kara Seas.

Arctic Frontier Service also solves issues in the maritime areas adjacent to the archipelago of Spitsbergen (see: Spitsbergen Treaty 1920) in the NEAFC Regulatory Area (NEAFC – North East Atlantic Fisheries Commission) – outside the exclusive economic zone of the Russian Federation.

1.4.4 Plans and standard procedures presenting the main action patterns

*a. "Arctic Frontier Service" responsibilities*

"Arctic Frontier Service" has the following tasks regarding border activity:

- 1) defence of the state frontier;
- 2) defence of marine biological resources;
- 3) monitoring and control of the movement of vessels on the Northern Sea Route in the Western sector of the Arctic;
- 4) implementation of compliance with the state's national interests.

*b. Russian national interests in the Arctic zone*

According to the "Fundamentals of the State Policy of the Russian Federation in the Arctic for the period till 2020 and for future perspective", general national interests of Russia in the Arctic are:

- 1) to use of the Arctic zone as a strategic resource base of the state, providing a solution to issues of socio-economic development; preservation of the Arctic as a zone of peace and cooperation;
- 2) to preserve the unique ecosystems of the Arctic;
- 3) to use the Northern Sea Route as a national integrated transport communication route.

*c. Monitoring and control procedure*

The central part of this activity includes complex measures on the use of forces and special equipment by 3 (three) structural units of the FSS:

- 1) "coast guard";
- 2) "operational unit";
- 3) aircraft.

Monitoring the situation in order to counter any terrorism threat, is carried out with the use of modern technical equipment adopted for use in the FSS.

Data is transmitted to the control center in real time, including satellite-based data. In addition, the control center receives information from interactive governmental agencies and federal executive bodies.

#### 1.4.5 Reflections on the operational patterns within violent action response at sea

Counterterrorism system in Russia is based on special regulations that are often considered an official or professional secret. We can conclude from the information above that the counterterrorism incident systems are strictly centralized and managed by federal authorities, especially in weapon use cases. Unfortunately, the deeper analysis of comparison of operational patterns between institutions is complicated to perform due to the lack of the information.

# Iceland

Soley Kaldal, Icelandic Coast Guard

## 1.1 Search and Rescue

### 1.1.1 Main institutions in the preparedness value chain

The Icelandic Coast Guard (ICG) is responsible for search and rescue (SAR) within the Icelandic search and rescue region (SRR) and is in command of marine and aeronautical SAR operations. The Icelandic SRR is vast, covering over 1.8 million square kilometres around the country and the distance from Reykjavik Airstrip, BIRK, to the furthest corner, i.e. North East corner, is 710 nautical miles. Within that area, the ICG is responsible for instigation and co-ordination of SAR activity but does not have to provide all resources. However, because of the Iceland's isolation, outside resources might be far away or only in vicinity by chance, so for swift reaction the Icelandic system must provide some basic resources.

The ICG co-ordinates SAR services of all available rescue units at, and above, sea. The ICG operates three patrol ships, one hydrographic survey/patrol vessel, three Super Puma helicopters and one Dash-8 fixed wing along with smaller fast boats.

The ICG dispatches its aircrafts from Reykjavik Airstrip BIRK. Personnel is quickly mobilized, often being able to take off within 30 minutes of an emergency call. Reykjavik is at the south west corner of Iceland.

The ICG runs a joint rescue co-ordination center, JRCC-Iceland, within its Operations Center and is in charge of communications with foreign rescue co-ordination centers regarding SAR operations in the Icelandic SRR and nearby SRRs.

Local police within the 9 police districts of Iceland in cooperation with the National Commissioner of the Icelandic Police (NCIP) are responsible for search and rescue on land, including harbors, so responsibility for search and rescue can shift between ICG and local police authorities and NCIP if an incident moves from land to sea or vice versa. Emergencies on the seashore where a vessel touches ground, for example a grounded ship right off the coast, are usually the responsibility of the local police and NCIP but based on the expertise needed for rescue the local police and NCIP can request that OSC is at the hand of the ICG. So, for example, if a vessel loses engine power in Iceland's territorial waters it is the responsibility of ICG to provide assistance if requested by the vessel. Should the vessel not send a distress signal or communicate the distress but instead drift into the surf and ground, the responsibility is moved to the local police and NCIP. If a ship is grounded on a rock out at sea, the NCIP usually would request the ICG to take over emergency response, as the ICG has equipment and expertise for such instances. A stranded ship will always be categorized as a rescue operation and voluntary rescue organizations, ICE-SAR, will be put on alert. Voluntary rescue organizations have good knowledge and equipment for rescue operations on land as well as in Iceland's territorial waters and are frequently asked to join and assist in search and rescue, providing the main bulk of responders for SAR on land.

Independent associations are an important link in rescue work in Iceland and ICE-SAR rescue teams have a few thousand volunteers around the country, available 24/7. ICE-SAR has fourteen near shore rescue vessels positioned at strategic locations around Iceland and a number of smaller rigid hull inflatable boats. ICE-SAR rescue teams provide SAR service at sea under command of the ICG.

If a vessel carrying more than 10 people is in distress and in danger of drifting towards shore the case automatically is categorized as a civil protection matter and require the participation of NCIP Department of Civil Protection and Emergency Management (CPEM). In those instances, the police works according to procedures regarding land based preparedness, for example with medical services and mass rescue centers.

As soon as main search and rescue operations are coordinated, the NCIP or local police as well as the Environment Agency of Iceland (EAI) take over. Police for investigation and the EAI for any pollution response or prevention.

During emergencies at sea and shore, JRCC-Iceland upholds electronic communication and information flow between the local police and NCIP and the ICG. As soon as people or equipment is brought to land, the local police chief takes over the project.

When ICG finds that broader co-operation is necessary, SMC activates the National Co-ordination and Control Center SST, which is located within the National Rescue Center in Reykjavik. Relevant actors, such as NCIP, ICE-SAR, Red Cross or others, are called to the SST based on the nature of emergency and operations are led by the ICG from there. All major actors in rescue service and planning have representatives there. Those are: The Civil Protection and Emergency Management Department of the National Commissioner of the Icelandic Police, Reykjavik Capital District Fire and Rescue Service (SHS), , ICG, ICE-SAR, 112, ISAVIA and the Red Cross. Representatives from , Landspítali University Hospital and The Icelandic Road Administration are called in when needed but do not have a fixed place there. The National Police Department's Communications Centre and the Emergency Call Centre 112 are situated in close vicinity. Furthermore, The Icelandic National Broadcasting Service, RUV, has a studio adjacent to the SST room. During the day it only takes a few minutes to respond to an alert and get the center fully manned. The SST is in control of all co-ordination between municipalities and different actors. A Public Relations officer at the ICG handles media communications.

The NCIP is in charge of SST but for each emergency, coordination is led by the organization responsible for SAR in the location. An example of an emergency requiring multi-organizational response is for example a stranded ship that needs the ICG and ICE-SAR for search and rescue, the police for OSC and the EAI to extract fuel from tanks for pollution prevention. SST is to be activated if more than one organization is required for response but some organizations have a bilateral communication agreement for common incidents, such as ICG and ICE-SAR. In order to ensure efficiency at the early stages of response ICG and ICE-SAR sometimes convene in JRCC-Iceland, as it takes time to activate SST and gather all members of the command center. Such an instance could be a boat sinking a few miles out from Reykjavik, where ICG would send helicopters and request ICE-SAR to send their fast boats. Such instances, where emergency response can be activated within minutes from JRCC-Iceland and the whole operation can be finished within an hour, might be further complicated with the activation of SST. There's however always the chance of an incident escalating and then SST would and could be activated at any stage of the response. The SST setup has proven to work favourably for all major emergency response, whether on land or at sea. As with all emergency response system's there are however some grey areas on when to declare SST active and in those instances the system relies on the experience and expertise of the commanding SMC.

Aside from the SST, which is for national coordination of emergencies, the police have local jurisdiction.<sup>6</sup> SAR on land is coordinated by the local police jurisdiction's operations center.



FIGURE 43. ICELAND POLICE DISTRICTS

ICE-SAR also has a regional division as can be seen on the following map.<sup>7</sup>

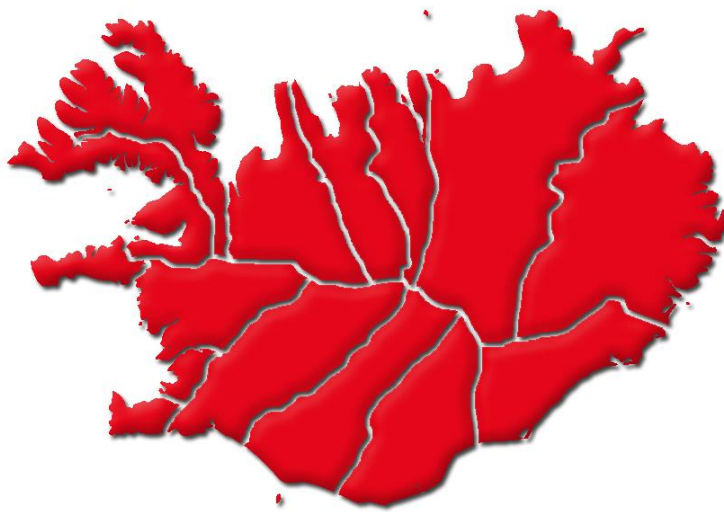


FIGURE 44. ICE-SAR REGIONAL DIVISIONS

Police jurisdictions and ICE-SAR regional divisions do not align but local police request ICE-SAR involvement based on the position of incidents.

JRCC-Iceland is the operations center for instances at sea in the whole search and rescue region. JRCC-Iceland activates SST through 112 which has a present group on a list for maritime SAR and aeronautical SAR. This includes staff from ICG, NCIP, 112 Emergency Call Center, ICE-SAR and for flight emergencies ISAVIA. ISAVIA handles the operation and development of all

<sup>6</sup> <http://www.lmi.is/wp-content/uploads/2015/05/logreglan.pdf>

<sup>7</sup> <http://www.landsbjorg.is/assets/nylidar.html>

airports in Iceland and manages air traffic in the Icelandic control area. The activation is always used immediately in case of a flight emergency as they happen rapidly, and an airplane can move between regions on land and sea within minutes. Sea vessel emergencies have a larger timeframe so as was said before, it is on the hand of commanding SMC to decide when to activate SST for sea emergencies.

For flight emergencies there are both response plans for all airports as well as CPEM plans for major accidents. Sometimes both plans are activated, especially in the initial stages when the control center is building a picture of the state of emergency. The most important aspect when more than one emergency response plan is activated, is that the plans align, and the state of emergency is compatible between plans. Civil protection in Iceland is categorized in three categories: Uncertainty Level, Hazard Level and Emergency Level. In some instances, the definition of civil protection level is not defined to the same extent, which can cause confusion.

Foreign pilots are furthermore not familiar with the system while communicating possible or actual emergencies, so it is at the hands of the SMC and the coordination center to determine the level. Icelandic pilots and Icelandic captains have received some training in the emergency response system plans and procedures.

The NCIP is the point of contact with foreign police forces.

Vessels of opportunity i.e. nearby vessels and other passers-by are obliged to assist the ICG in rescue of human life when requested, without endangering their own life, health, welfare or significant interests.

The Department of Civil Protection and Emergency Management provides support in emergency that are of a magnitude that require their co-operation and in case of fires on board vessels the municipalities' fire brigades provide specially trained fire fighters.

### 1.1.2 Organizational model, command systems and external relations

The organizational chart of the ICG is as follows:

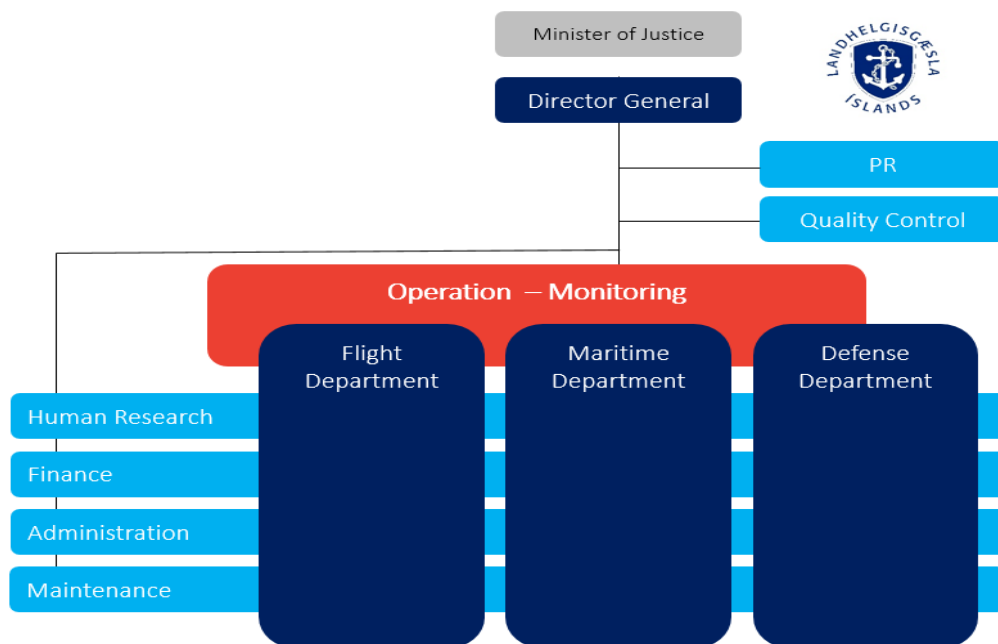


FIGURE 45. ICELANDIC COAST GUARD ORGANIZATIONAL CHART

Anyone who receives emergency information on events in Iceland's SRR is obliged to notify JRCC-Iceland. Emergency calls for events at sea are made directly to JRCC-Iceland in most cases but in some instances, an emergency call is sent to JRCC-Iceland through the 112 Emergency Call Center.

Shipping traffic is monitored by the ICG and whenever JRCC-Iceland notices inconsistencies in signals from ships in the automatic identification system (AIS) a preliminary SAR operation is begun, as it might indicate the existence of an adverse event. JRCC-Iceland is also the official recipient of distress messages from the Cospas/Sarsat System (SAR Point of Contact) for the Icelandic SRR.

ICG Chief of Operation or his substitute/deputies will act as SAR Mission Coordinator (SMC).

On-scene co-ordination is carried out by the unit considered best suited by JRCC-Iceland, whether it is patrol vessel, aircraft, civilian vessel or other platform. Full co-operation is expected of all nearby actors but understood if they don't trust themselves to participate due to weather and such factors

For traditional search and rescue operations, procedures are based on the IAMSAR manual. There are furthermore mass rescue operations plans effective for regional areas that have traffic that calls for extra planning, such as industrial ports, cruise ship and ferry ports and locations with whale watching activity. The largest of these regional contingency plans (Viðbragðsáætlun vegna sjóslysa, Herjólfur og önnur farþegaskip<sup>8</sup>) is designed to be applicable with minimal changes in case of emergencies in other locations. Plans for a more general emergency plan for emergencies involving passenger ships are in the initial stages and will presumably be completed within the next couple of years.

Making of contingency plans is a developing field in Iceland. The NCIP's CPEM is a small department and other organizations within the emergency preparedness system have only in recent years begun acquiring risk management professionals. As a result, the relationship between SMC and existing contingency plan is sometimes not completely unambiguous, i.e. the SMC must follow the existing plan but not without basing decisions on critical knowledge and experience. For a relatively large country, with vast marine areas but a small population, a small group of people are in charge of mitigating a great variety of events and emergencies, which is difficult to codify completely in contingency plans. The plans are therefore a tool for the SMC and not vice versa. The ICG's centre of operations is responsible for maritime assistance service, maritime rescue coordination, aeronautical rescue coordination, fisheries monitoring, vessel traffic tracking, coastal radio signals, AIS etc. This creates a certain level of synergy in the system but can simultaneously be a large load for a single organization.

There is not a designated SMC course available in Iceland at the moment, but the ICG has hopes that it will be established in the future for the operators of JRCC-Iceland.

The Icelandic Meteorological Office actively monitors weather conditions and weather stations are situated all over the island giving good indication of what's to come. However, the fact that Iceland is an island and a quite isolated, makes predicting the weather a bit more problematic. As mainland weather forecasters have a wider net of stations, Icelanders are limited to the edges of the country and the odd stations in the middle of the ocean. Those stations are difficult to maintain and expensive to run. Therefore our professionals have to

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<sup>8</sup> <http://www.almannavarnir.is/utgefid-efni/vidbragdsaaetlun-vegna-sjoslysa-herjolfur-og-onnur-farþegaskip/>



analyze the weather reported where they can and project those situations on to Iceland and its surrounding territorial waters.

### 1.1.3 Operational hierarchy and management responsibilities

The ICG's Operations Department is led by the Chief of Operations which is directly under the Director General. The ICG's Operations Center alerts the Chief of Operations or his deputy on call duty who then contacts the relevant sub-division of the ICG, such as Flight Operations or Special Operations, or other organizations in the preparedness system.

Chief of Operations, or his deputies, assume the role of SMC in maritime operations. SMC determines who should be OSC and the role of OSC can be moved between units based on how the emergency evolves. For example, a vessel of opportunity could be assigned the status of OSC until a rescue aircraft or ICG patrol vessel arrives. SMC adjusts directions based on the receiving OSC. The OSC is to obey the demands of the SMC but the SMC in turn follows the recommendations of the OSC, since in many cases the on-scene unit has access to better situational awareness. The SMC does not enforce a command the OSC is not prepared to fulfil. The captain of the distress vessel is also an important link in SAR operations. SMC will coordinate and consult with the distress vessel commander, as they are ultimately in charge of their ship, crew and passengers.

ICG's SMC will contact ICE-SAR and request their boats if the distress signal is in a certain vicinity of land (exact distance is determined on case-by-case basis, based on weather and other circumstances). Then ICE-SAR will activate their system and launch a boat with a trained rescue crew. The ICE-SAR rescue crew will follow the instructions of SMC and in accordance with contingency plans (if available).

### 1.1.4 Plans and standard procedures presenting the main action patterns

Plans and standard procedures are according to Icelandic laws and regulations as well as the IAMSAR Manual. JRCC-Iceland has an operation manual, which includes a SAR operation instructions and action patterns in emergencies. It is only available in Icelandic at the moment.

The standard procedures in an emergency are as follows: When JRCC-Iceland has received first information or indications of emergency the Watch Officer collects basic information through a standardized checklist. All information is logged in a system. Then the Watch Officer alerts the Chief of Operations. When the emergency is confirmed, and threat level determined a Mayday Relay is sent out and all nearby vessels asked to provide assistance. All relevant responders are contacted and dispatched. Watch Officer and Chief of Operations continue gathering information and communicating with responders to give updates on response progress and threat level may change throughout operations.

### 1.1.5 Reflections on the operational patterns within maritime SAR

Responsibility for maritime SAR is clearly and firmly on the hands of the Icelandic Coast Guard. The most common cooperative actor is ICE-SAR. Fire brigades are rarely called for assistance and currently there's not an existing written agreement between ICG and the fire brigades. There is an oral agreement between the ICG and fire departments that fire fighters are provided in certain circumstances on certain conditions and this has proven to be sufficient in the past. This includes mostly the Capital Area Fire and Rescue Brigade. A standardized agreement such as MIRG would be preferable and the ICG and fire department are working towards exploring possibilities for such. The police are hardly ever involved in maritime operations. When incidents overlap between ICG and local police and NCIP, for example

moving to shore and up on land, or for groundings, responsibility moves quite smoothly from ICG to local police and NCIP and vice versa through cooperation in the SST. Since the ICG is a country-wide organization and does not have regional forces the operational patterns are the same regardless of the location of the incident.

## 1.2 Oil Spill Response

### 1.2.1 Main institutions in the preparedness value chain

The ICG is responsible for monitoring Iceland's marine spaces for acute pollution. Monitoring is upheld through a combined approach; ICG's center of operations, with satellite images, overflight of ICG's aircrafts and patrol vessels. ICG receives satellite images regularly from European Maritime Safety Agency (EMSA). Experts at the ICG and University of Iceland examine the images and if they raise concerns, Department of Operations decides on a plan of actions. Sometimes nearby commercial ships are asked to provide visual identification, at other times an ICG aircraft or vessel is sent for further investigation. If actual pollution is detected it is reported immediately to Environment Agency of Iceland (EAI). EAI takes over responsibility from there and is responsible for managing acute pollution incidents on high seas. EAI co-operates with the Icelandic Transportation Authority (ITA) and the Icelandic Coast Guard (ICG) on organizing response as well as division of tasks between the agencies.

An example of an event involving a detected oil spill would be that first observers place an emergency call to JRCC-Iceland. JRCC-Iceland immediately activates appropriate response for the ICG and then alerts a representative at the EAI with text message to EAI specialists on duty through 112. Following the alert, a field director from the EAI will be sent on site as soon as possible. An EAI field director instructs when to initiate acute pollution prevention actions and he or she also determines when operations are completed. The EAI has trained oil spill field directors. Simultaneously an emergency meeting will be called together at Iceland's Civil Protection Co-ordination Center, in Skogarhlid downtown Reykjavik. The meeting will include (but is not limited to) representatives of the department of Civil Protection, the EAI, the ICG and the ITA. A co-ordinated action plan between the agencies is required by law and the plan is supposed to include what is at stake and what is being protected. It shall state available pollution control equipment as well as an action description and contact details for those in charge of response. There is also to be an operational pollution prevention board appointed by the Minister for the Environment and Natural Resources.

Response and mitigation will in any case be co-ordinated in close co-operation between the agencies with support from expert consultants such as Marine Research Institute (MRI) and veterinarians from Reykjavik Zoo. As all contingency plans have clear emphasis on prioritizing human lives and health, first efforts revolve around establishing the status of workers, passengers, crews and other people who might be in danger.

As soon as SAR efforts have been co-ordinated, environmental issues can be addressed. Any business ventures that can cause pollution shall have a response plan for acute pollution and this plan shall be ready and available before issuing an operating license. The EAI can request an examination of vessels, tankers and platforms at sea without a court order, if there is suspicion of danger to the environment. The examination shall not cause undue disruption of operations or unnecessary expenses for the business. The EAI shall have unrestricted access to all information on equipment for pollution prevention, as well as measurements and reports on pollution prevention status. The business is obliged to provide all necessary information and hand over any samples required without a fee.

There are three main techniques used to control oil spills and minimize their impact. Which technique or method is used is dependent on the spill but all require real time monitoring of natural conditions and tracking of the spilled oil in order to honour appropriate safety measures. Mechanical containment and recovery are the most common approach, where booms, barriers, skimmers or natural confinements are used to capture and store the oil until it can be properly disposed of. Sometimes chemical and biological agents, such as dispersants are used in conjunction with mechanical techniques. These chemicals drive the oil faster into a dissolved phase, but they are effective for limited time and can only be used if oil type and characteristics are suitable. Finally, in-situ burning involves controlled burning of oil on water surface. To be effective, the oil must be of a certain thickness and be used promptly after spill.

The EIA has an agreement, signed in 2006, with a private oil distribution company called Ólíudreifing on response and clean-up. Ólíudreifing is responsible for storing equipment and training personnel to use it. The equipment, stored in Örfirisey in Reykjavik, is mostly applicable for coastal clean-up, but some of it can be loaded on board vessels for open water clean-up. As soon as EIA's field directors arrive on site, they can activate the agreement and oversee that proper protocol is taken. The polluting actor has the obligation to reduce event impact to the best of their ability, as well as the right to oversee procedures. If the polluting actor considers their ability to clean-up to be more successful and cost-efficient, the polluter, taking into account the "polluter pays" principle, has the right to construct a mitigation plan which must be accepted by the EIA. There is no rule on the timeframe of this process, but a representative of EIA said that it is expected to be within 1-2 days. While the plan is being assessed, mitigation work will continue to be in the hands of EIA. It will be determined on case-by-case basis to what extent each plan will be accepted and how takeover will happen. An EIA field director will regardless of an accepted polluter's mitigation plan be present at all times to oversee that clean-up is properly executed.

The ICG has oil pollution clean-up equipment on board its patrol and SAR vessel Thor. Thor has one 300 m offshore oil boom specially made and tested for rough weather and difficult offshore conditions in the Arctic. They are designed for long-term operations. It furthermore has a free-floating offshore skimmer, suitable for all types of oil. It is designed for open ocean oil recovery operations and can be operated from 200 m distance. The oil recovered is pumped into heated storage tanks within the vessel. Thor has an approximate speed of 20 knots and could therefore need 1-2 days to reach the site of emergency, based on its original position.

The Icelandic Transport Authority (ITA) is responsible for monitoring quality of pollution prevention equipment on board vessels and assists in clean-up operations in offshore areas.

### 1.2.2 Organizational model, command systems and external relations

The EAI is responsible for initiating oil-spill response and is in charge of operations. The EAI has an Ocean and Water Team, responsible for marine and freshwater quality, under the Department of Nature, which is directly subject to the Director of the EAI. The EAI can request that the local Health Committee go to the site of emergency to evaluate the extent of pollution and assess necessary actions. EAI appoints a field director to oversee response actions. EAI then contacts ICG for assistance and equipment.



FIGURE 46. EAI ORGANIZATIONAL CHART

### 1.2.3 Operational hierarchy and management responsibilities

EAI's field director decides when to start pollution response and when it is completed. If the pollution is of such magnitude that it constitutes a threat to the general public the NCIP's Department of Civil Protection and Emergency Management's emergency plan is activated.

EAI, ICG and ITA have made an action plan for acute offshore marine pollution. The directors for all three organizations are responsible for the action plan and its implementation. ICG's Chief of Operations is responsible for complying with the plan and JRCC-Iceland's Chief Watch Officer is responsible for introducing the plan to the staff. EAI's field director receives alerts of acute pollution, decides the level of response and upholds communications with off-location responders. ITA provides consultation on issues regarding sailing, navigation, port facilities, weather and sea conditions, technical issues and legal matters.

### 1.2.4 Plans and standard procedures presenting the main action patterns

EAI, ICG and ITA made an action plan for acute offshore marine pollution. The action plan is activated on four levels

- For an event where no pollution is visible and no risk of pollution
  - A ship alerts JRCC-Iceland of an accident but confirms no danger of pollution. ICG is in charge of activating the action plan.
- When there is risk of pollution
  - The state of the vessel calls for concern of pollution. ICG is in charge of activating action plan and notifying EAI and ITA. EAI is responsible for pollution response preparation.
- When pollution is visible
  - EAI is in charge of activating the action plan.

- When ship must seek shelter
  - Captain asks to seek shelter or ICG instructs the vessel to seek shelter on grounds of pollution risk. ICG is in charge of activating the action plan and alerts other relevant response actors.

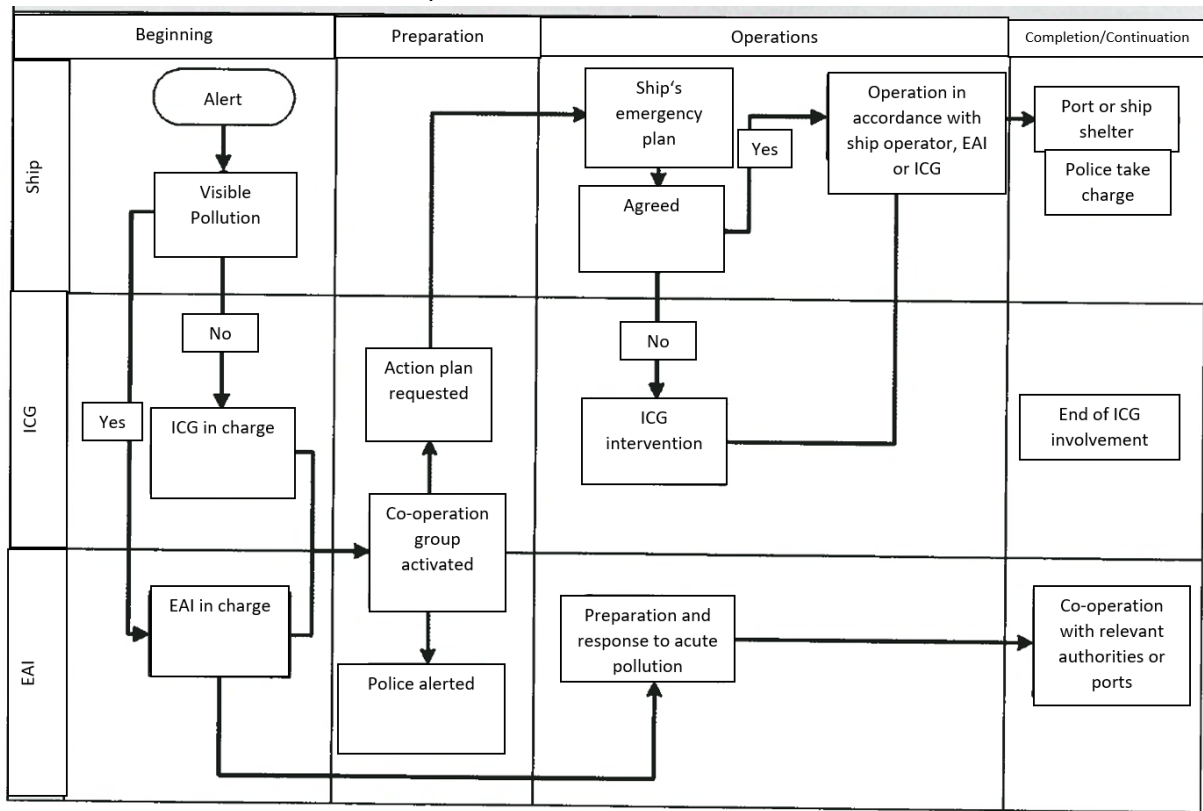


FIGURE 47. EAI, ICG AND ITA ACTION PLAN

### 1.2.5 Reflections on the operational patterns within oil spill response

Fortunately, there have not been many significant acute pollution events in Icelandic waters in recent years. For those instances that have occurred, cooperation between EAI and assisting organizations, mainly ICG, has been good and without complications. Due to the size of the country's marine spaces, oil spill response will be quite different based on where the event is located. In that context and taking into an account the size of Iceland's population it is clear that oil spill response will always have an element of uniqueness and therefore be somewhat determined on a case-by-case basis. Good cooperation and communication are thus a key element. Each incident is reviewed after response and recovery, providing an important learning opportunity for the involved organizations.

## 1.3 Firefighting

### 1.3.1 Main institutions in the preparedness value chain

There are 38 fire brigades in Iceland with about 1600 fire fighters total. Four of those are fully professional:

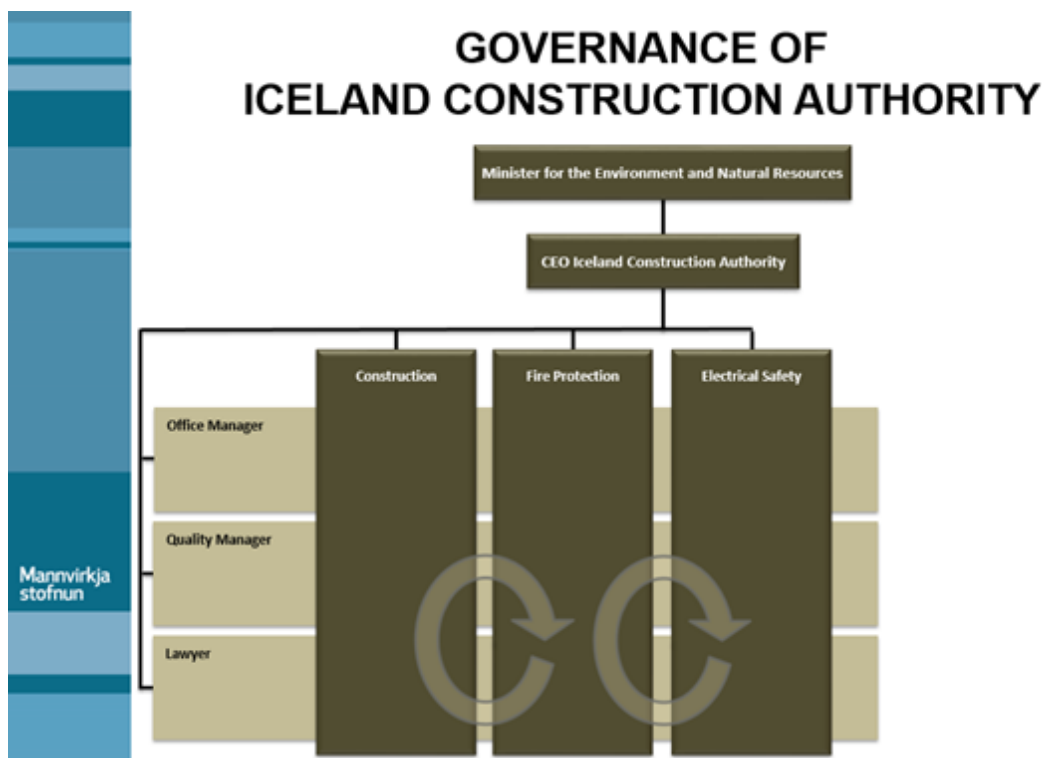
1. One for the capital area, called SHS
2. One for Reykjanes peninsula where Keflavik International Airport is located as well as large ports

3. One for Akureyri, principal town of North-Iceland where there's both an international airport and a large port
4. One for Fjarðabyggð Municipality, which includes Egilsstaðir, principal town of East-Iceland where there's an international airport, Reyðarfjörður town where a large aluminum smelter is located and a large port, and Seyðisfjörður where Smyril Line, the large ferry between Iceland, Faroe Islands and Denmark comes to port.

11 more fire brigades are semiprofessional, having one or more full time firefighters, and supplementing with part time firefighters.

23 additional fire brigades are with part time firefighters are scattered around the country, located in every municipality.

There is no central governmental organization for firefighting in Iceland. Firefighting and fire response on land is the responsibility of each municipality. However, fire protection, making of fire prevention plans, fire brigade supervision and fire protection instructions for all permanent structures on land and at sea are the responsibility of Iceland Construction Authority, which is a government organization directly under Minister for Environment and Resources.



**FIGURE 48. ICELAND CONSTRUCTION AUTHORITY ORGANIZATIONAL CHART**

Firefighting in marine emergencies falls under SAR in the Icelandic preparedness system so the Icelandic Coast Guard (ICG) co-ordinates firefighting response in the SRR. Firefighting at sea is subject to the national government but firefighting on land is the responsibility of the municipalities and therefore all professional firefighters are municipal employees. Maritime incident response training is expensive and extensive and preliminary work on a co-operation

agreement between the government and fire stations is underway, but a contract has not been signed. Therefore, only an informal agreement exists between the ICG and Reykjavik Capital District Fire and Rescue Service (SHS) where the organizations strive to provide at least three professional firefighters, including smoke divers when marine emergencies call for such response. The firefighters can be transported to vessel in emergency by helicopter or vessel, ICG's SMC evaluates on case-by-case basis the priorities of firefighting versus evacuation and distributes units accordingly.

There are no official agreements, plans or regulations for firefighting at sea in Iceland. SHS and ICG cooperated on a report about a decade ago reaching the conclusion that a formal agreement should be made for firefighting at sea. Recently the ICG has emphasized the importance of implementing a plan, such as MIRG, in Iceland, but the government has not made decisions to move forward with that. Despite the lack of a formal agreement, cooperation between SHS and ICG has been good and SHS has strived to provide firefighters when marine incidents have required more professional firefighting than is available within the human resources of ICG. Both the ICG and SHS have emphasized the importance of formalizing maritime firefighting education, equipment and procedures, through an official agreement similar to those found in neighbouring countries. Coordination and implementation of such an agreement would have to happen with the support of the government.

Comprehensive firefighting equipment is on board the ICG's patrol vessels including fire extinguishing systems and protective gear.

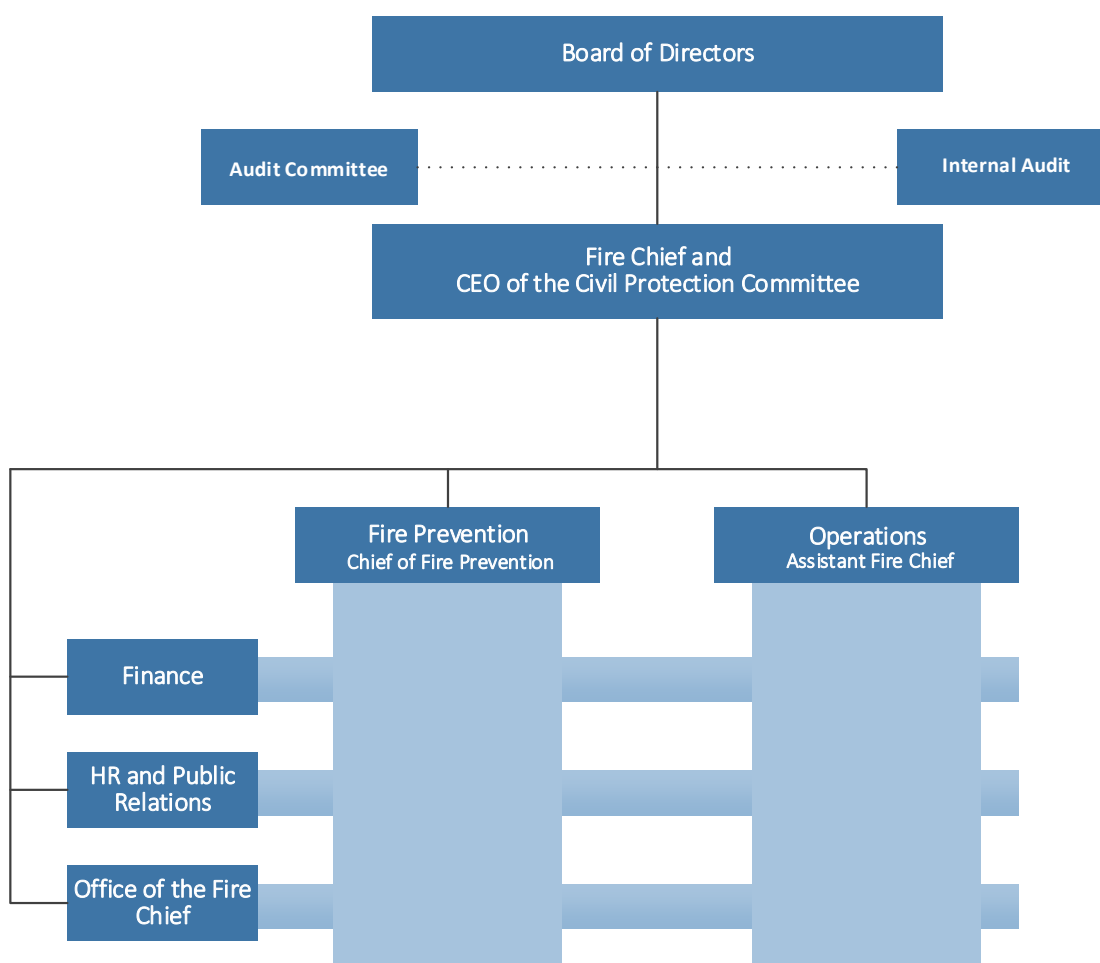
ICE-SAR has fire hoses in their larger boats and port authorities around the country have water cannons on their tugboats.

Vessels of opportunity in some instances have firefighting equipment and would be called to assist.

Iceland maritime Safety and Survival Training Centre runs courses on maritime firefighting for seafarers. They also offer advanced courses for patrol vessel crews and ICG's EOD.

### 1.3.2 Organizational model, command systems and external relations

Firefighting on land is a municipal responsibility in Iceland. Firefighting on sea is the responsibility of the Coast Guard. There are however only available municipal fire brigades and the ICG does not have a fire brigade of its own. Crew members of patrol vessels and aircrafts as well as the EOD unit, have a different level of marine firefighting education and do respond in most instances. When more competence is needed, an oral agreement exists with SHS to provide firefighters to their ability and as far as safety regulations allow.



**FIGURE 49. ICELAND CAPITAL AREA FIRE DEPARTMENT ORGANIZATIONAL CHART**

### 3.3.3 Operational hierarchy and management responsibilities

The same as for Search and Rescue.

### 3.3.4 Plans and standard procedures presenting the main action patterns

The same as for Search and Rescue.

### 1.3.3 Reflections on the operational patterns within fire fighting

The difference of ICG being a governmental organization and SHS being a municipal organization might contribute to the fact that there's not a formal agreement between the fire brigades and coast guard for maritime firefighting. Lack of budget is also a contributing factor. As the ICG is responsible for firefighting at sea the SHS expects that the ICG finances all special training required for firefighting at sea for quite a few SHS personnel, including HUET training that takes place abroad and has to be repeated every other year.



## 1.4 Violent action situation and counterterrorism

### 1.4.1 Main institutions in the preparedness value chain

Response to violent action at sea is largely dependent on the United Nations Convention on the Law of the Sea (UNCLOS).

NCIP is responsible for actions and operations against violent action situations as well as counterterrorism in Iceland and in Iceland's territorial waters, which reach out 12 nm from baseline. From the limits of territorial sea and extending out 200 nm at most, in the area called the exclusive economic zone (EEZ) the coastal state has sovereign rights, but those rights do not extend to response to violent actions or terrorism on board vessels flying a flag other than the Icelandic one. The ICG enforces the sovereign rights stated in UNCLOS, regarding exploring, exploiting, conserving and managing of natural resources, but not beyond that. Icelandic law enforcement does not have authority to ascent vessels flying foreign flags in the EEZ unless there is a violation of Art. 56 of UNCLOS or a request.

Vessels in international waters are legally subjected to their flag state law, and the responsible person is the captain. If the NCIP receives an official request of assistance from the flag state, they will respond in the appropriate manner.

The flag state can authorize the NCIP to take actions against attackers on board a vessel in international waters and Icelandic authorities have some jurisdiction to act within the EEZ for example if there's an imminent threat of acute pollution which would endanger the ecosystem or other national resources.

For events in waters outside the Icelandic EEZ, but within the SRR, Icelandic authorities do not have jurisdiction but NCIP could begin counterterrorism response at the behest of the flag state.

The NCIP does not own equipment to reach marine emergencies so transport and logistics would be in co-operation with the ICG. Police officers and Special Forces are transported with ICG's helicopters or patrol vessels to location.

The NCIP does not have (at least not publicly accessible, nor available upon request) a plan for counterterrorism at sea. The NCIP however makes a yearly terrorism hazard assessment. Marine incidences are not mentioned in the hazard assessment for year 2017.

With regards to safety measures, the International Ship and Port Facility Security (ISPS) Code is confirmed for international shipping and port facilities in Iceland. ITA sets rules on how to conduct security screening of crews and passengers in ports. The Directorate of Customs sets rules on how to conduct security screening of cargo. Port Authority in each port is responsible for management of port security.

NCIP determines threat level for each port and shares that information with Port Authority Security Officer, ICG operation center which includes the maritime transportation center, ICG, relevant municipal police chief, Directorate of Customs, ITA and vessels coming to port.

Vessels that fall under the International Convention for the Safety of Life at Sea (SOLAS) are to have a distress button on the bridge, which can be pressed in case of an attack. The button sends a signal through the Inmarsat satellite network to a control center at the flag state.

SOLAS applies to ferries, tankers and freighters and there are no SOLAS/ISPS ships flying the Icelandic flag. Iceland Transport Authority is responsible for ISPS code and port verification.

## 1.4.2 Organizational model, command systems and external relations

The organizational chart of the NCIP is as follows:

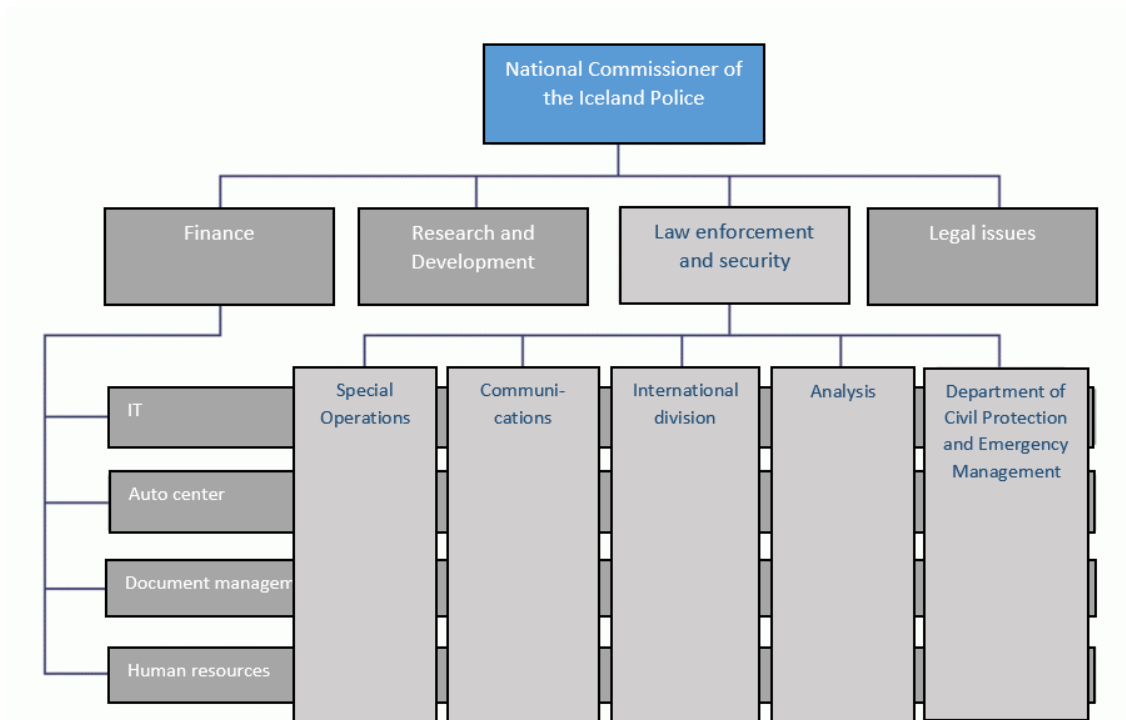


FIGURE 50. NATIONAL COMMISSIONER OF THE ICELAND POLICE

## 1.4.3 Operational hierarchy and management responsibilities

Violent action situations and counterterrorism fall under the Department of Law enforcement and security at the NCIP's headquarters. The NCIP's International division is a part of the department of Law Enforcement and Security. The international division is responsible for international relations and is in charge of communication in the field of law enforcement for domestic and foreign police forces when it comes to international police co-operation. The division is a SIRENE-office for Schengen co-operation and the national office for INTERPOL and EUROPOL co-operation. It is also in charge of various Nordic co-operation. The task of the International are complex, e.g. Inquiries about individuals and their criminal records, legislation and implementation and law enforcement requests for assistance in investigating cases. For further information on international co-operation department of this page International co-operation.

The International division is involved in border controls by checking crews and passengers of vessels coming to Iceland with the SIS II Schengen database.

## 1.4.4 Plans and standard procedures presenting the main action patterns

An act of terrorism has not occurred in Icelandic waters so there are no main actions patterns to analyze.

General plans for maritime terrorism do not exist.

#### 1.4.5 Reflections on the operational patterns within violent action response at sea

Task division for maritime law enforcement is quite clear, with ICG enforcing UNCLOS and derived rules and regulations and NCIP enforcing Icelandic law beyond UNCLOS in territorial waters. All maritime law enforcement is dependent on ICG for equipment and transport and cooperation in those instances has been without complications. As has been mentioned in previous chapters, due to the large size of Iceland's marine spaces but relatively small response system, incidents are commonly unique in some aspect and therefore not covered by written plans or procedures and rather dealt with by the head of operations for the responsible organization. Experience and knowledge of these people is often the factor that can best predict the outcome of response. Having a small number of people in charge of incident response has the advantage of forming personal bonds between actors, which shortens lines of communications and can benefit cooperation.

## Greenland

Emergency prevention, preparedness and response is in Greenland a task shared between Greenlandic and Danish agencies since Greenland is a semi-autonomous constituent part of the Danish realm and not an independent state. Basically, the relationship between the two countries is determined by the Danish constitution (revised in 1953) and the Greenland Self Government Act (adopted in 2009). According to § 3, the Danish constitution applies to “all parts” of the Danish realm, these parts being Denmark proper, the Faroe Islands and Greenland. In everyday talk, the relationship between the three countries is, traditionally, called either the “unity of the realm” or the “community of the realm”. Recently, this has changed to the official label “The Kingdom of Denmark”, while the “Danish realm” is also used (Denmark, Greenland, & Faroe Islands, 2011: 10). So, strictly speaking, the agencies that form the emergency systems in Greenland are Greenlandic agencies, Danish realm agencies, and a combination of Greenlandic and Danish realm agencies. The formal reason why some Danish realm agencies are part of the emergency preparedness system in Greenland, is the provisions in the Self Government Act that Greenland are entitled to take over domestic policy areas from Denmark, but not security and defense policy and a number of other policy areas. These areas cannot be taken over as long as Greenland does not declare itself as an independent state. Also, for practical reasons, some domestic policy areas that can be taken over by Greenland have not been taken over, yet; that is the case with the Greenland Police (Ackrén & Jakobsen, 2015).

### 1.5 SAR

#### 1.5.1 Main institutions of Search and Rescue in the preparedness value chain

In this section, the main institutions at the strategic and operational levels of Search and Rescue (SAR) are described. Both the Greenland initiated institutions of the Emergency Preparedness Commission and the Greenland Emergency Preparedness Staff and the Danish realm institutions of the Greenland Police and the Joint Arctic Command.

#### **The Emergency Preparedness Commission**

The Emergency Preparedness Commission was established in 2010 in accordance with the Act of the Inatsisartut, the Greenland Parliament, on emergency preparedness (Inatsisartut, 2010). At the strategic level, the commission is the highest formal authority and includes both Greenlandic and Danish realm authorities with the purpose of providing a platform for coordination between the different institutions involved in emergency prevention, preparedness and response and in case of “greater catastrophes” (Inatsisartut, 2010).

The Emergency Preparedness Commission is the organizational focal point for the overall transverse crisis management between Greenlandic and Danish authorities. It is, however, a forum for discussion between Greenlandic and Danish authorities and institutions and has no independent decision-making power. The role of the commission is to inform and advise the Government of Greenland, the mayors of the municipalities and foreign authorities on the emergency conditions, to activate and coordinate the Greenlandic authorities of emergency management activities, as well as to coordinate contingent emergency management activities

from foreign authorities and to assist and coordinate the contact between Greenlandic authorities and the press. However, in the case of a critical event, it is the Chief Constable of the Greenland Police that informs the Danish Ministry of Justice and the Danish National Police, since the commission has no independent authority to make decisions and it does not involve itself in the operational aspects of specific crisis situations (naalakkersuisut.gl).

The Greenland Ministry of Nature and Environment's Department of Environment and Contingency Management functions as the secretariat of the Emergency Preparedness Commission. The Emergency Preparedness Commission consists of seven permanent members and three appointed officials who represent the Greenlandic and Danish authorities:

***Government of Greenland***

- Ministry of Nature and Environment with the deputy minister functioning as chair of the commission and
- Department of Environment and Contingency Management functioning as the secretariat of the commission
- The National Health Authority with the Head of the National Health Authority, who has the same management authority as a deputy minister, participating in the meetings

***The Greenland municipalities***

- The five municipalities of Greenland select one common representative as member of the commission

***The Danish realm authorities***

- The office of the Chief Constable of the Greenland Police
- The office of the Joint Arctic Command
- The office of the High Commissioner of Greenland

In addition to the seven members, three more institutions are authorized to participate in the meetings for the commission:

- Ministry of Health
- Ministry of Nature and Environment, the office of oil emergency preparedness
- Ministry of Mineral Resources and Labour

At the operational level, the Greenland Emergency Preparedness Staff has recently been established as a common forum for authorities in charge of the actual emergency capacities: Greenland Police, Joint Arctic Command, health authorities and the emergency preparedness authorities at the municipality management level (Skibsfartens og Luftfartens Redningsråd, 2017). The municipal level capacities can supplement the SAR capacities in Greenland especially at the local level, but the main SAR capacities are divided between the Greenland Police and the Joint Arctic Command (Jakobsen, 2018). The task of the Greenland Emergency

Preparedness Staff is the operational coordination of the different authorities involved in major emergency situations.

### **The Greenland Police**

The Greenland Police is a Danish realm institution and a section of the Danish national police organization that is the police authority of the whole of the Danish realm including Greenland, the Faroe Islands and continental Denmark. At the strategic level, the Danish Ministry of Justice is responsible for the Greenland Police. The main task of the police is, of course, to maintain order and ensure compliance with laws and regulations. However, the police are also an important actor within the emergency preparedness organization in Greenland (politi.gl).

The Police is headed by the Chief Constable of Greenland Police based in Nuuk. Administratively, the Greenland Police District is divided into two regions since August 2018: North Greenland and South Greenland that covers the 5 municipalities in Greenland but not the National Park in the North East, which covers 45% of the total Greenland territory of 2.166.000 square kilometers (politi.gl).

This is clearly a vast area for a police authority with only 18 police stations in 18 towns all over Greenland from the far North to the South. Especially, outside the capital of Nuuk it has been a problem to provide service for citizens after 16 p.m. on workdays and in weekends and on holidays, since the local offices are often only manned by one person. Now, a nationwide control centre has been established, which is responsible for receiving and coordinating all inquiries to the police between 16 p.m. and 08 a.m. on weekdays, and on Saturdays and Sundays and public holidays all day long (politi.gl).

Organizationally, the Greenland Police is divided according to a three-level model: a strategic level with leading staff members, an operational level at which the KSN (the Greenland Police Command Station) is situated, and a tactical level or the command stage. At the operational level, Greenland Police is responsible for maritime SAR operation in local and coastal waters. The SAR operations are directed by the KSN. Among the police staff that all in all counts 321 employees are 21 trained sailors that are engaged at the four police cutters that are available for SAR operations depending on the specific needs and whether they are occupied with other police matters (Jakobsen 2018).

The Act on emergency preparedness in Greenland states that all joint actions in case of accidents and catastrophes are coordinated by the Chief Constable of the Greenland Police (Inatsisartut 2010: §13, 1). This principle is of general application in all cases regardless of which authority is responsible for the search and rescue actions. The principle is also applied in normal everyday life – for instance in case of fire or traffic accidents.

## **The Joint Arctic Command**

The Joint Arctic Command was established in Nuuk in 2012 by joining the former Faroe Islands Command and the former Greenland Command. Besides the headquarters in Nuuk and the liaison unit in Thorshavn, the Joint Arctic Command maintains a liaison team at the Thule Air Base in Northwest Greenland and five smaller units spread out at different locations in Greenland from north to south: Station North (situated at 81 degrees North), Station Daneborg, Station Mestersvig, Station Kangerlussauq and Station Grønnedal (situated at 61 degrees North) (forsvaret.dk).

Like the Greenland Police, SAR operations are not the main tasks of the Joint Arctic Command (JAC). Its main tasks are military defence of Greenland and the Faroe Islands, surveillance and maintenance of sovereignty of the northern parts of the territory of the Danish realm. In addition to its main - military - tasks, JAC also has civilian tasks as SAR, Oil Spill Response (OSR), fishing vessels inspection and other forms of support to the civilian society. JAC hosts the Joint Rescue Coordination Centre (JRCC Greenland) at its premises in Nuuk. JRCC in this way becomes an integrated part of the JAC.

Since January 2014, the Danish Ministry of Defence has been the sole responsible for the Joint Arctic Command at the strategic level. JAC is responsible for the management of maritime rescue operations outside coastal waters and within the 200 nautical miles limit and the Search and Rescue Region that is the responsibility area of the Danish realm as agreed by the governments of the eight Arctic Council members at the Arctic Council ministerial meeting in Nuuk in 2011 (Arctic Council, 2011). The Greenland maritime SAR Region equals around 3 million square kilometres and is clearly a huge area for an organization as the Joint Arctic Command with 70 employees in Nuuk and 100 all in all (forsvaret.dk).

In connection with SAR operations, JRCC has all military units in Greenland at its disposal from the Royal Danish Navy and the Royal Danish Air Force. The Danish Ministry of Defence also has a contract with Air Greenland that allows JRCC operative access to the use of Air Greenland capacities for SAR purposes. In a larger emergency situation, the Danish Arctic Emergency Preparedness Force can be mobilized and deployed in Greenland within a couple of days. This clearly illustrates that maritime SAR in Greenland is the responsibility of the Danish Government, primarily the Danish Ministry of Defence, and the Danish armed forces. The operative management is situated at JAC including JRCC. None of the military units at disposal for SAR operations are either acquired or designated solely for SAR tasks but for their main tasks of defence, maintenance of sovereignty and surveillance (Skibsfartens og Luftfartens Redningsråd, 2016).

1.5.2 Organizational model, command systems and external relations

Since the Greenland Police is part of the Danish National Police, it is part of the general organizational model:

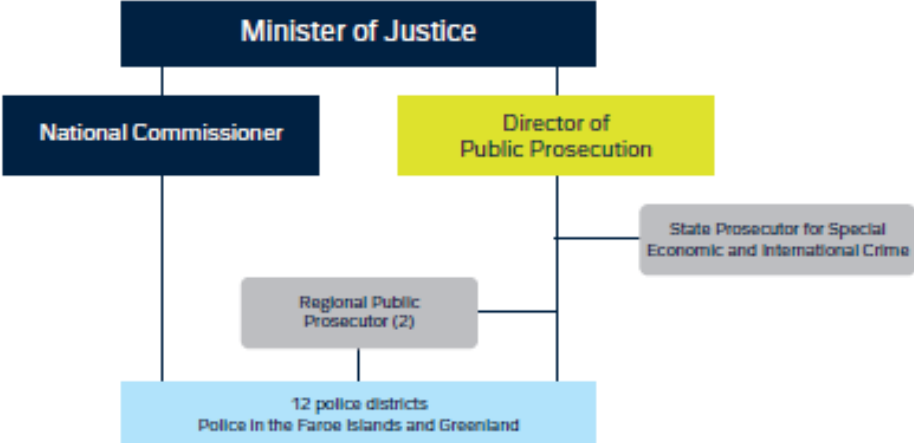


FIGURE 51. ORGANIZATIONAL CHART FOR THE DANISH NATIONAL POLICE

As figure 51 depicts, the organization of the Danish National Police is structured in three levels: The minister of justice at the top, the National Commissioner of the police at the second level, and the police districts at the bottom level.

The management model of the Greenland Police district is also a three-level organization:



## Principles for lead managements

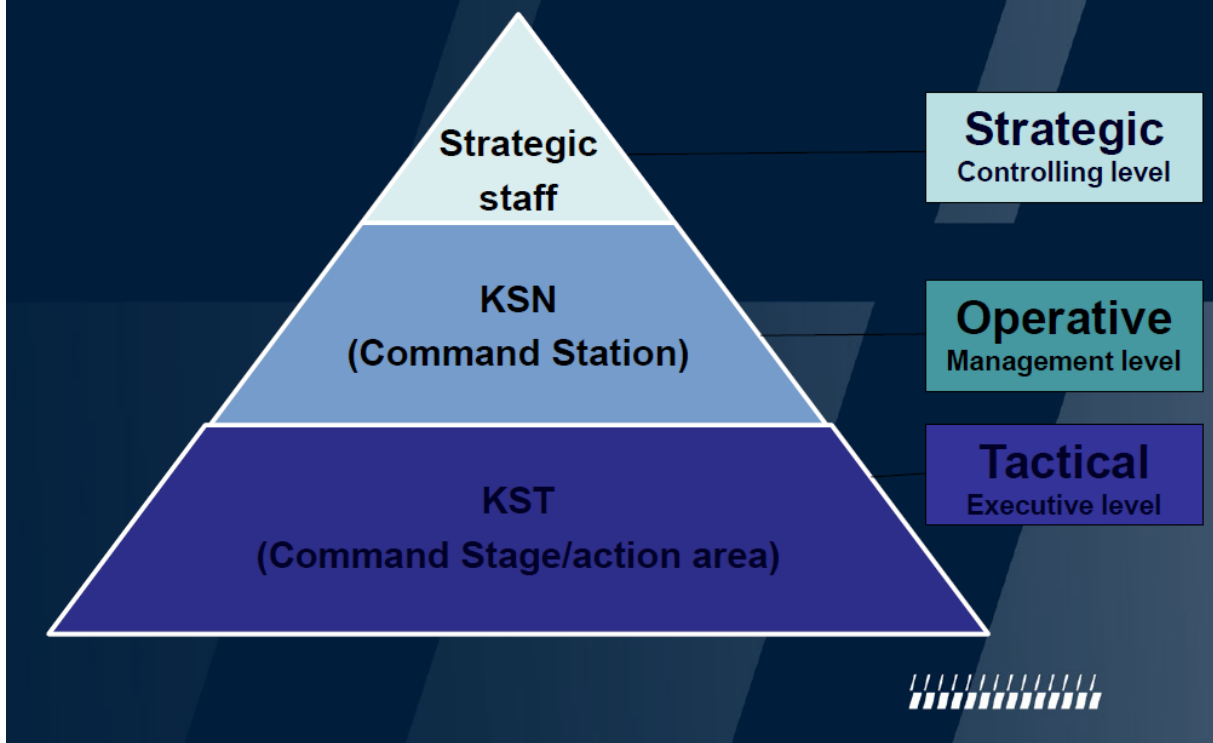


FIGURE 52. ORGANIZATIONAL CHART FOR THE GREENLAND POLICE

Figure 52 depicts, at the top, the strategic level of the Chief Constable and other leadership staff with command over the whole district. At the middle, operational level is the central command station. And the third, tactical level is the actual executive staff.

The Joint Arctic Command is also part of a hierarchical institution:

## DEFENCE COMMAND DENMARK



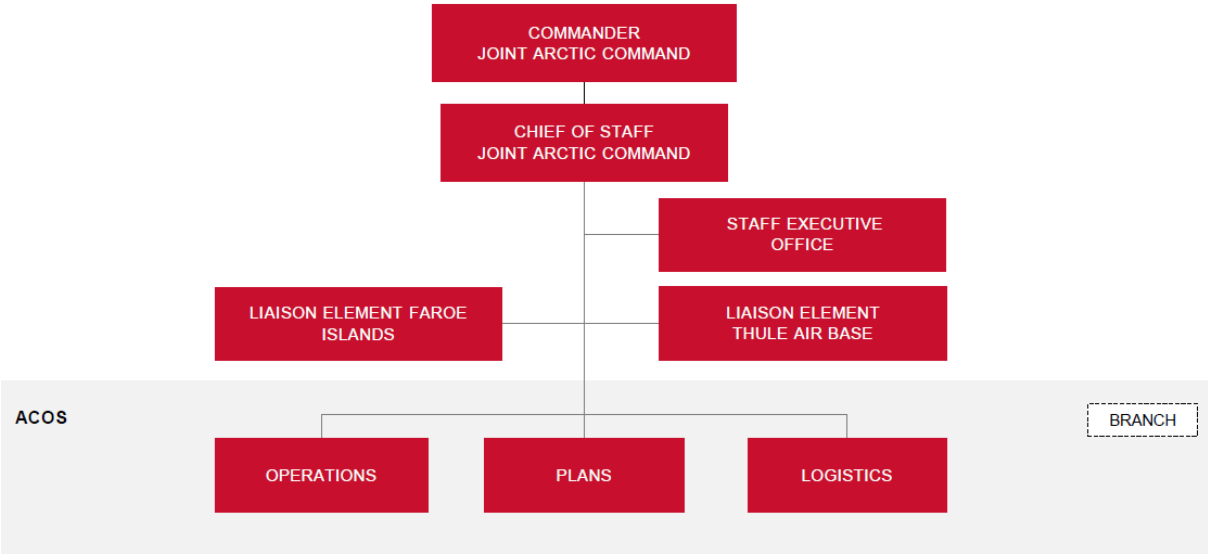
FIGURE 53. ORGANIZATIONAL CHART OF THE DANISH DEFENCE COMMAND

Figure 53 shows the chief of defence at the top level and the Joint Arctic Command at the same horizontal level as other units of the defence organization.

The Joint Arctic Command is itself a hierarchical organization:

# DEFENCE COMMAND DENMARK

## JOINT ARCTIC COMMAND



**FIGURE 54. ORGANIZATIONAL CHART OF THE JOINT ARCTIC COMMAND**

With the Commander at the top and a number of departments at the bottom horizontal level, these department are partly self-governing as they are also small in number of personnel affiliated with each department.

Since the SAR responsibility in Greenland is divided between the Greenland Police and the Joint Arctic Command, the first decision to be made in case of a SAR emergency alarm is which of the two institutions will be responsible as SAR Mission Coordinator (SMC) in each case depending on whether the SAR incident is situated within local and coastal waters, in which case it is allocated to the Greenland Police, between the coastal line and the 200 nautical miles limit or the limits of the Greenland SAR Region, in which case it is allocated to the Joint Arctic Command.

The two Greenland SAR responsible institutions have agreed on this principled outline for the allocation of responsibility as SMC:

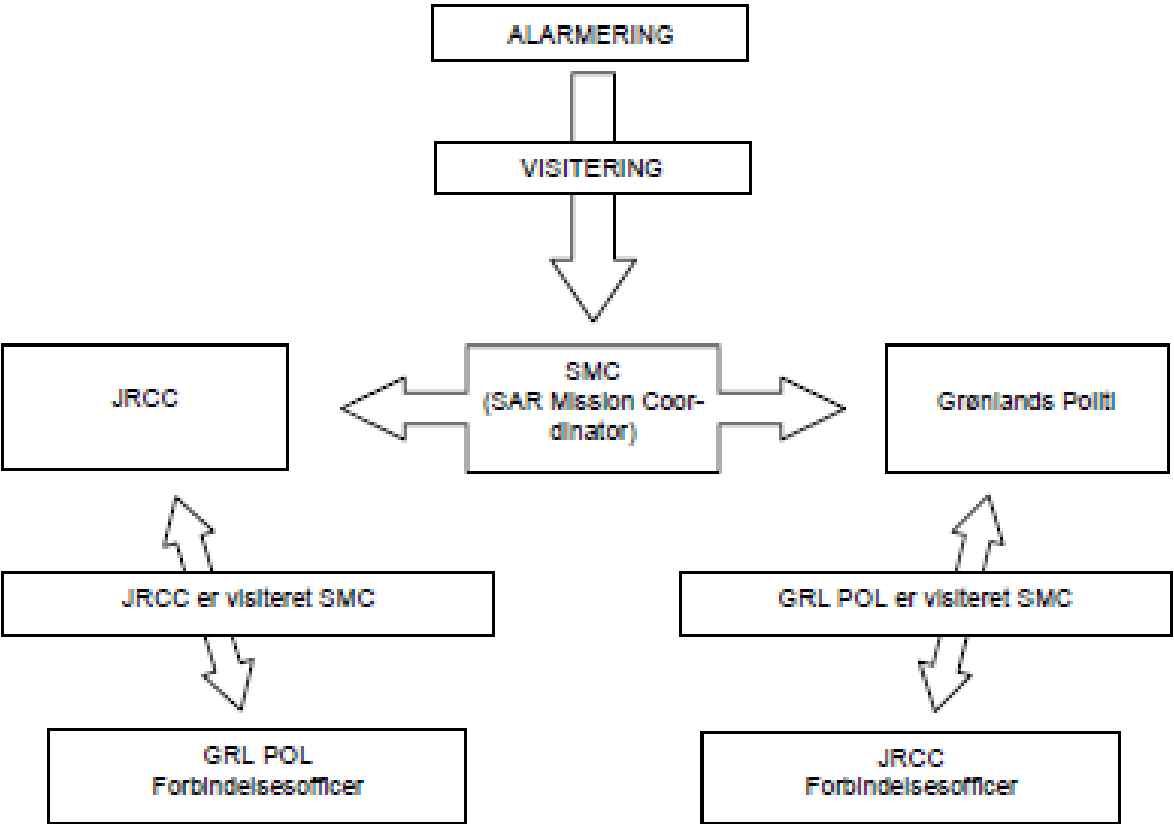


FIGURE 55. PROCEDURES FOR ALLOCATION OF RESPONSIBILITY AS SAR MISSION COORDINATOR

Figure 55 depicts the principled outline that the SAR responsible authorities in Greenland have agreed on for the procedures for allocation of responsibility as SAR Mission Coordinator (SMC): When an emergency call is received (“Alarmering”) by one of the SAR responsible authorities in Greenland (either JRCC Greenland or Greenland Police Command Station (“KSN”), the other SAR responsible authority is contacted to determine who should be the responsible SAR Mission Coordinator (SMC) - called the visitation process (“Visitering”). A SAR event may change SMC as soon as it is realized that the other SAR responsible authority can more effectively coordinate the operation. The designated SMC must always seek to make decisions in cooperation with other SAR responsible authorities. If a SAR incident, after the designation of the SMC, develop in a way in which it is deemed necessary to call reinforcement from JRCC or/and the Greenland Police, liaison officers (“Forbindelsesofficer”) are exchanged between the SAR responsible authorities. (Skibsfartens og Luftfartens Redningsråd, 2016: 4.)

As a hierarchical organization, the Greenland Police, of course, has a command structure, but no existing plans are made public and it seems that the mitigating of a variety of incidents is difficult to codify in an overall plan. As a military organization, the Joint Arctic Command might be close to the NATO organizational principles or command and control philosophy for joint operations, where a command is seen “an intrinsically forceful, human activity involving authority as well as personal responsibility and accountability” (NATO, 2017). However, both

in the case of Greenland Police and Joint Arctic Command SAR operations, the number of people involved in SAR activities is relatively small - be it in the case of a one-person manned police station, a helicopter crew or a small vessel crew - and in such circumstances the involved officers often has to handle on their own decisions instead of receiving commands or follow standard operating procedures. As small units with a composition of the personnel from different branches of the Armed Forces (Air Force, Army and Navy) and other departments within the ministry of defence, the personnel will have different culture and skills, even if they have the same employer (Correspondence with JAC). Rather than a stable structure, the organization may more resemble an on-going process. Therefore, rather than a system of commands, the small units in the organization may be seen as systems of cooperation, even if the overall system of the Joint Arctic Command is a hierarchical organization with an overall command structure. In addition, the complex character of the tasks of JAC rather requires coordination and cooperation. Within management theory, complexity has traditionally been combined with decentralization - the more complex the context is, the more decentralized the decision-making structure is or needs to be (Mintzberg, 1973).

This is especially relevant in the case of Greenland. Since the responsibilities for SAR at the operational level are divided between the Greenland Police, with responsibility for SAR in local and coastal waters, and the Joint Arctic Command, with responsibility for SAR in the rest of the maritime territory within the Greenland SAR Region, a precondition for leadership decision-making within the framework of a complex system like this is a close cooperation between the two primarily involved institutions to create a situation of consensus on the division of tasks and responsibilities (Skibsfartens og Luftfartens Redningsråd 2016).

### 1.5.3 Operational hierarchy and management responsibilities

In case of a larger incident with more institutions working together, the Emergency Preparedness Commission, chaired by the deputy minister of the Ministry of Nature and Environment, will be summoned to discuss the situation and collecting necessary information at the strategic level: Does the Government of Greenland and Danish authorities support the operation, are the financially necessary spending authorized by the appropriate decision-makers etc. The Emergency Preparedness Commission will leave the operational decisions to the Greenland Emergency Preparedness Staff, headed by the Chief Constable of the Greenland Police, where apart from the police also the Joint Arctic Command, the Ministry of Health and the emergency preparedness authorities at the municipality management level (fire brigades etc.) are represented.

However, even if the Greenland Emergency Preparedness Staff is supposed to coordinate between participating institutions, the institutions still keep the responsibility within their respective sectors. The SAR Mission Coordinator will already have been appointed as part of the visitation process when the alarm was received (see section 4.2). Greenland Emergency

Preparedness Staff, headed by the Chief Constable of Greenland Police, is a tool for the Chief Constable to coordinate the operational tasks between the participating institutions and to secure the coordination between the different management levels within the police organization; the KSN (Police Command Station) coordinates police actions between the operational level and the strategical level, and between the operational level and the tactical level (Correspondence with Greenland Police). The Joint Arctic Command (JAC) also participates in the Greenland Emergency Preparedness Staff to coordinate with the other participating institutions. Ships deployed by JAC remains under operational control by the JAC. In case of larger incidents, an on-scene coordinator (OSC) will be appointed and will refer to JRCC Greenland. In this case, ships deployed by the JAC will refer to the OSC (Correspondence with Joint Arctic Command).

If a sufficient level of capacities is not available in Greenland for a larger incident, the authorities will first try to get capacities from Denmark if this can be managed within the timeframe at disposal. If not, it has to be brought in from other states geographically closer to Greenland with a shorter response time. In the case that the supply of capacities has to be brought in from Denmark, the Danish Armed Forces and the Danish Emergency Management Agency will establish the Arctic Emergency Force that is a flexible military unit that can be composed according to the needs for the specific situation and context. The Arctic Emergency Force will normally refer to the JAC. If relevant, it will refer to the OSC in an on-going operation, but in the last instance it will refer to JAC. The Danish Armed Forces will be responsible for the transportation from Denmark to a hub in Greenland, and JAC will be responsible for the transportation to the scene of operation. If foreign military forces have to be brought to Greenland, they will operate at the tactical level and refer to the OSC. In cases where this is most appropriate, there is also the possibility to appoint the foreign forces as OSC (Correspondence with JAC). All in all, in cases of the mass rescue operation, the organizational composition of SAR is rather complex and difficult to coordinate.

#### 1.5.4 Plans and standard procedures presenting the main action patterns

Standard procedures for SAR Mission Coordinator are listed in the SAR operation manual “SAR - Grønland”, which is only available in Danish, compiled by the Danish Ministry of Defence according to i.e. the IAMSAR Manual and available at the website of the Joint Arctic Command (forsvaret.dk). It is a comprehensive checklist mentioning many to-do points:

The SAR Mission Coordinator must gather and evaluate information on:

- The exact time of notification or alert
- The missing vessel's name, registration number etc.
- Also, size, color and characteristics
- Number of occupants, name, gender, age, language.
- Equipment, including dressing, hunting and fishing gear etc
- Radio systems and automatic emergency transmitters

- Rescue and signaling means such as rafts, emergency rockets etc.
- Inventories of fuel and supplies.
- Departure time and place.
- Estimated time of arrival and place, planned route etc.
- Last contact with the vessel, place and time.
- Weather and ice conditions since last contact.

On the basis of the information obtained, the SAR Mission Coordinator must:

- Assess the need to start a SAR operation.
- Assess the need for deployment of rescue units.
- Inform other rescue centers in or outside Greenland
- chart civilian entities for deployment in the search.
- Inform and ask the public for information and assistance
- Send out a PAN message
- Performing broadcast of Mayday Relay.
- Determine the scan area and direct the insertion units
- Deciding on the end of the search.
- Notify - via police or shipping company - relatives about the search and rescue operation and the results
- Inform the press
- Inform hospitals etc.
- Certify civil bills that have been chartered to participate in the SAR operation

#### 1.5.5 Reflections on the operational patterns within SAR

The SAR responsibility is divided between the two main SAR institutions in Greenland: The Greenland Police and the Joint Arctic Command. Even if the procedure for allocating a specific task to one of the institutions are quite detailed, it still takes the willingness to cooperate to make it function. The two institutions differs as to presence and availability - normally the police will have a much shorter response time, since police stations are scattered all over the country even if they are few in numbers, while the Joint Arctic Command with relatively few ships in the area can be far away from the SAR site and often too far away to reach it by helicopter. However, only the Joint Arctic Command has the capacities to SAR operations in open waters. But when they cooperate, they can supplement each other.

An important factor as to efficient resource allocation, coordination, command and control may be the Emergency Preparedness Commission. It brings strategic decision-making to the political level and to the public via the press contacts that are the responsibility of the Emergency Preparedness Commission. And that is probably to a great deal contributing to the security of citizens and society's measures against accidents and disasters, which is one of the foremost political aims of the Government of Greenland for having a contingency management system (naalakkersuisut.gl).

Some might think that many differences and similarities concerning command structures and operational patterns exist between a civilian institution as the police and a military institution as the Joint Arctic Command. But this distinction concerning types of organization is not tantamount to effectiveness in cases of SAR operations. Of course, command systems are important in both a police institution and a military institution. However, several indicators show that this may not be the case in the way SAR operations are handled in a complex situation like Greenland emergency systems neither in the Arctic in general. Looking to the language aspects and the terminology, “command” is actually rarely used. Instead it is “cooperation”, “agreements” and “decisions”. This hints at the hypothesis that a formal command system and formal rank in hierarchical institutions as the Greenland police and the Joint Arctic command is not that important.

A study based on observations during the LIVEX 2016 exercise in and around Nuuk in the spring of 2016 seems to support this. A network analysis showed that emergency management tasks are often performed through informal coordination rather than “by the book” of a manual of standard operating procedures. Instead, the informal coordination network that emerges among engaged in a SAR mission who share interests and experiences and communicate directly with each other is more important. The staff at JAC that participated in the exercise was organized in different cells according to NATO-principles. However, the analysis demonstrated that formal rank was not the most important aspect, but previous operational Arctic experience was essential together with the ability of cooperating for the success of the SAR operations (Dahlberg, 2017). This may be a single example, and the field is not well theorized, but further research into the importance of actual experience, informal skills and an inclusive decentralized and cooperating environment in SAR operations certainly seems promising.

## Conclusions

Emergency preparedness and response, and especially large-scale maritime incident response operations in the Arctic context are high complexity operations and require robust cooperation between various agencies. Large-scale operations like mass evacuation and the following SAR response may call for support from neighboring countries. There is a need for specialized, high utility capacities and experienced and well-trained personnel. Large-scale incidents and mass rescue operations (MRO) are low-probability, high-consequence events that in most cases exceed the capacities of the preparedness and response system of any one country. The response agencies do not have much experience of these types of incidents in the Arctic region as they do not happen often. However, effective response to such major incidents require careful planning fast mobilization, a well-functioning logistics system, fluent coordination, and the use of resources from multiple organizations and neighboring countries.

This report has examined the emergency preparedness systems of Norway, Russia, Iceland, and Greenland in the fields of search and rescue (SAR), oil spill response, firefighting and violent action at sea. Within each country and each field, the report has looked into some key questions regarding the main maritime emergency preparedness and response institutions, organizational models, management responsibilities and the main operational patterns and procedures. The report first of all describe the main coordinating institutions and their main responsibilities within each sector.

The biggest challenge with large-scale maritime incidents such as major oil spills, mass rescue operations, ship fires, hazardous and noxious substance incidents, violent action or all of these combined, is that the response system capacities of one country, who is responsible for coordinating the response, is most likely not sufficient to respond to the scale of the incident. This means that the response efforts will be multi-agency, nationwide and possibly international in nature. And it will take more time than in more central regions with a well-developed infrastructure and more fine-grained network of resources. In the Arctic where resources are scarce and respond times are long, access to specialized capacities such as firefighting or chemical response resources take extra time. Multiple authorities and organizations will be involved, requiring robust coordination between all response efforts on sea, on land and in the air. Lack of personnel and especially persons to fill the key management roles may reduce efficiency and speed of action.

In these situations, the amount of strain on each person will increase. This calls for both a clear understanding of who is in charge, the roles of all involved, and how to interact with each other. Plans and means of communication are especially important in large-scale incidents as there are normally huge amounts of information running through the system and the system therefore needs to be interlinked amongst organizations at various levels at sea, on land and in the air. Challenges with communication, both technical and organizational, end up often being one of the key issues with efficient coordination, command and control. High task complexity and limited resources also calls for improvisation skills among managers and personnel.

The higher-level coordinators and incidents commanders must have sufficient knowledge and expertise of Arctic conditions in order to lead missions effectively. For example, poor communication network might lead to a situation where the operational coordinator on land cannot establish connections with vessels at the incident site and the coordinator on-scene



will have to take on additional responsibilities when it comes to overall incident coordination and planning.

Scarce resources in the Arctic areas and long response times also mean that accessible resources might come from other countries, private operators or other organizations that normally do not take part on emergency response. Knowledge of the regional resources, neighboring countries' systems, private operators' capacities, operational procedures, routines, management roles, and functions are important in order to avoid delays and unnecessary confusion, and to maximize efficiency. Several international meetings with the emergency preparedness authorities in Arctic countries have shown that there is a need for further understanding and familiarization with each other's systems, organizations and contingency plans.

### **Maritime Search and Rescue**

Coordination of search and rescue for maritime and aeronautical incidents in all the examined countries will be fairly similar due to international IMO conventions and the International Aeronautical and Maritime Search and Rescue (IAMSAR) manuals that all the countries follow. The basic structure of the SAR system including key roles and responsibilities, means and ways of communication, operational and tactical management tools and techniques, etc. are defined in the IAMSAR manuals. Besides international conventions, cooperation agreements are also established bilaterally and multilaterally in the Arctic.

For all the countries the international and bilateral agreements are an important part of efficient SAR cooperation. The RCCs of the European Arctic regions also frequently meet to discuss challenges, among others within the Arctic Council working group EPPR.

Large-scale maritime incidents may include both search and rescue efforts, firefighting, large-scale logistics efforts, medical and coroner, hazards mitigation, damage control and salvage operations, accident-incident investigation, and intense public and political attention. These challenges need to be coordinated together with other authorities and different stakeholders such as the ship owner/operator and vessel captain. SAR authorities may be responsible for all, or part, of the major incident response, but normally have to delegate some tasks, among others due to lack of capacity. This means that the SMC must be able to coordinate their efforts seamlessly with other incident responders. Some incidents might also fall under overall direction of another authority or incident command system such as in violence or anti-terror action. Because national safety and security authorities have various command structures, major incident response plans must typically allow for command, control and communications structures aligning simultaneous air, sea and land operations. Understanding each other's roles and producers within this framework, both nationally and internationally on all levels of management, will facilitate more efficient cooperation.

Although the basis for SAR services in all countries is the same and the necessary elements will be there, the way of organizing the system is different in all countries. All leading SAR authorities in Norway, Russia and Iceland are civilian organizations. All these authorities have different organizational structures, national plans and procedures, use of resources, training and some special SAR functions. For example, Iceland follows a model seen in many other countries where the Icelandic Coast Guard, under the Ministry of Justice is the leading SAR authority operating the Joint Rescue Coordination Centre (JRCC) and utilizing their own assets for response such as patrol vessels and aerial assets. Iceland also relies heavily on volunteers from the volunteer organization ICE-SAR on coastal and land areas. In Norway, the

coordinating SAR authorities are the two JRCCs (JRCC Stavanger in the South and JRCC Bodø in the North) directly under the Ministry of Justice and Public Security and led by the chief of police of the two police districts where the JRCCs are located. The JRCCs can utilize all available assets for response and is in charge of the government rescue helicopters. The Norwegian Coast Guard is a vital SAR response organization operating surface search and rescue units and often responsible for on-scene coordination at the incident site.

The Russian SAR system involves various ministries, agencies and organizations. This may reduce efficiency due to different authority. However, all agencies are integrated in the Russian Unified State System of Emergency Prevention and Response (USSoEPR) making coordination easier between all the agencies. The main institutions are the Ministry of Transport (responsible for SAR at sea), and EMERCOM (responsible for SAR on land and on rivers, lakes, landlocked seas, and in territorial waters out to 12nm). They are also responsible for providing staff and equipment, managing search and rescue systems; establishing Maritime Rescue Coordination Centres and Maritime Rescue Coordination Sub-Centre (MRCC/MRSCs operated by Ministry of Transport); allocating SAR equipment; coordinating SAR personnel preparedness; working out SAR operations arrangement and procedure, etc. In addition, the Russian Ministry of Defense and the Federal Security Service of the Russian Federation (FSB) with the Coast Guard Division are taking part at tactical level. The Ministry of Defense and the Federal Security Service use their own resources and specialists. The Federal Fishing Agency is also responsible for the safety of the fishing fleet and to perform search and rescue operations in the areas of fishing. Russia does not use voluntary assets for maritime SAR like Iceland and Norway.

In Greenland, the SAR responsibility is divided between the two main SAR institutions in Greenland: The Greenland Police and the Joint Arctic Command. The two represent very different organization, however the procedure for allocating a specific task to one of the institutions are quite detailed. When it comes to organization structures and culture, as a hierarchical organization, the Greenland Police, of course, has a command structure, but no existing plans are made public and it seems that the mitigating of a variety of incidents is difficult to codify in an overall plan. As a military organization, the Joint Arctic Command might be close to the NATO organizational principles or command and control philosophy for joint operations.

All countries have a national SAR management board, a commission where representatives of all relevant national agencies and organizations within emergency response can be called in to coordinate assets and efforts in major incidents. In Russia there are commissions at the federal, interregional, regional and local levels. In Norway, there are SAR management boards at two levels, national for the two JRCCs, and regional linked to the RSC at each police district. In Iceland the National Co-ordination and Control Center would be mobilized.

Making cooperation plans and having regular exercises with vessel operators increases knowledge and efficiency between the SAR authorities and ship owner crisis management staff. Strategic level cooperation for Arctic specific SAR is important for all three countries including the Arctic Council's Emergency Prevention, Preparedness, and Response (EPPR) working group and with Arctic SAR related projects and exercises, but also bilaterally including annual exercises between Russia and Norway, and Norway's close cooperation with Iceland on Jan Mayen.

Operational duties for SAR, including the search and rescue mission coordinator (SMC) role, in all countries are based on IAMSAR and therefore cooperation on operational level is also fluent between the countries. In situations where foreign units and assistance is requested for SAR, the request will always go from RCC to RCC making cooperation on operational level straightforward. Although the roles and responsibilities are similar in each country, the entry level competence, requirements, qualifications and training of SMCs is slightly different in each country. All nations will also have different patterns in working with other preparedness agencies' operational management including operational leaders from the police, fire and rescue service, medical service, armed forces, oil spill response authority, voluntary organizations and so on. SMCs need to have knowledge of the neighboring countries search and rescue region and resources in the area, but it is also good to recognize how SAR systems in the region are structured in different countries and what kind of services are supported by each country. For instance, in Russia firefighters are trained for land operations or fighting fire on a vessel that is docked in the harbor but have limited training at sea. SMC needs to consider tactical level capabilities, and prior knowledge on available assets and services will make planning more efficient.

National MRO plans and standard operating procedures could also be shared on the operational level to all relevant operational leaders. Maritime SAR in Russia is conducted according to SAR plans for people in distress at sea by a regional search and coordination centre. In Iceland, plans and standard procedures are according to Icelandic laws and regulations as well as the IAMSAR Manual. JRCC-Iceland has an operation manual, which includes a SAR operation instructions and action patterns in emergencies. In Greenland, standard procedures for SAR Mission Coordinator is listed in the SAR operation manual "SAR - Grønland", compiled by the Danish Ministry of Defence according to the IAMSAR Manual. In Norway, the JRCC has plans of operations categorized by the incident type. Having regular tabletop exercises between operational level management in different countries would give the SMCs a better overview on what kind of national procedures do the other countries have and learn good practices from each other. This would also include consideration for the evacuation and reception points, emergency evacuation centres and the responsibilities for the ship owners and other shore-side authorities.

One of the biggest challenges for operational level incident management is communication with all organizations, participants and stakeholders. Communication often becomes the challenge that hamper efficient cooperation and command, whether it was due technical challenges with the equipment and network or cultural challenges with language or an overwhelming amount of information and requests coming from various direction from sea and land or too little information and only few situational reports resulting into low situational awareness. In the Arctic region where communications may be poor and, in some places, nonexistent, the SMC and the ship owner crisis staff could end up in a situation where they cannot establish communications with the incident site. This means that whoever is in charge of coordination at the incident site will have to take in a lot of responsibility and leadership of the incident.

The tactical level SAR management is often under a lot of pressure even when the communications links and networks are functioning well. The on-scene coordinator (OSC) role in maritime SAR is again similar in all three countries because the OSC task and responsibilities are defined in the IAMSAR manual. Limited training in this role is a challenge. In Norway, the OSC would often be the commander in charge of a coast guard vessel, master of another

professional search and rescue unit (SRU), or a captain of a ship that is sailing near-by and is competent to take over the role. Similarly, in Iceland on-scene coordination is carried out by the unit considered best suited by JRCC-Iceland, whether it is patrol vessel, aircraft, civilian vessel or other platform. In Russia according to the Russian interaction plan, the master of a rescue vessel arrived at the emergency site at first, acts as "on-scene coordinator". The master of another vessel arrived at the emergency site at first, acts as "coordinator of above-water SAR" until the rescue vessel arrives. Large-scale response will most likely involve units from various different organizations including civilian, military, semi-military, and voluntary organizations as well as Good Samaritan vessels sailing near-by.

The on-scene coordinator will be in charge of coordinating all the units that arrive at the incident site to assist, plan tasks for all the units and is responsible for making sure that all are doing the tasks accordingly. OSC is also responsible for carrying out the search action plan provided by the SMC and modifying the plan based on the prevailing conditions.

In large-scale maritime operations, the OSC is an essential communication link between the RCC, the distress vessel and the units arriving on scene. Communications challenges - technical, cultural and organizational - are also present at the incident site. The OSC might not be able to establish the connection link due to technical restrictions with the communications network or technical platforms with some assisting units might be different. There could also be language and cultural challenges between the OSC, the distress vessel, SRUs and other vessels helping on-scene that might not be trained for SAR and do not speak same language or terminology.

The on-scene coordinator role is very challenging, stressful and often requires a whole team around the person who is assigned as an OSC.

The master of the distress vessel is responsible for the vessel, the passengers and the crew for all types of acute emergency and preparedness incidents where the vessel is involved. Rescue measures on board a vessel in distress are coordinated by the master. The master also needs to assess the conditions on-scene and of the vessel in order to make the best decisions for passengers' safety.

In order to support coordination and cooperation between countries and agencies, training with other authorities, voluntary organizations and ship companies is recommended especially when it comes to communications, unexpected situations, and mass rescue operations in High Arctic waters. Although there is a lack of full-scale MRO exercises in the Arctic waters, developing specialized training concepts and scenarios for managerial roles in various levels of emergency preparedness in the Arctic context would also provide more specified training opportunities- Improvisation is also an important part of decision-making under complexity. Thus, some training should be dedicated to practicing unexpected, low-probability situations such as a violent action attack. High-level, large-scale exercises are often scripted and well planned; however it is also important to have reasonably unscripted exercises to leave room for improvisation.

### **Oil Spill Response**

Many Arctic countries have stated that if there is a major oil spill in the Arctic region, one country's capabilities are not enough to respond to an oil spill incident in such scale. Oil spill response in the Arctic would have to be a joint effort with various authorities, organizations, companies, volunteers, and neighboring nations.

Oil spill response in Norway follows the incident command in line with the Norwegian Incident Command System (ELS) model. The basic structure is a small and flexible body with fixed functions. However, during bigger incidents the ELS can expand its operational body. In large-scale incidents or incidents under difficult condition, a strategic body may also be included to execute the strategic coordination.

The Russian Federation regulates offshore oil and gas activity in the Arctic through a complex system of rules derived from the constitution, multiple statutes and decrees. The Russian system is based on a hierarchical command structure established at multiple levels: the federal government makes decisions, while the regions execute them and also bear responsibility for conducting OSR operations in case of emergency. The federal authorities are responsible for all emergency situations in Russia, including OSR, and are organized and performed in the framework of USSoEPR, which integrates the state authorities and OSR resources.

OSR in Russia is a tiered system conducted at multiple levels by the federal executive authorities, the administrations of the Russian Federation's sub-units (including local administrations) and oil companies. The OSR system is divided into sea and land sectors that function under the auspices of two different ministries – EMERCOM for the land sector and the Ministry of Transport for the marine sector. Oil spill operations at sea are coordinated by the Maritime Rescue Coordination Centre (MRCC). On the local level, OSR operations are coordinated by operations centers of maritime transport RosMorPort's branches, shipping companies and other organizations engaging in petroleum exploration, production, processing and transportation.

The analysis of the contingency plans of private and state organizations operating on the sea shelf of the Russian Federation, shows that some companies adopt the structure of the Incident Command System. ICS has the advantage of combining different federal, state, and local agencies, and the responsible organizations into the same organizational system enhancing coordination of spill response activities and avoiding duplication of efforts. The emergency commission may appoint further functions to the ICS structure such as planning, logistics, etc. Depending on the incident location, size and types of response operations required, the incident command may request additional response assets and personnel from other operators in the region or vicinity.

The Russian OSR legislation and system itself is currently under change as the national OSR policy and system in Russia has not been fully developed. ICS structures described in the oil spill contingency plans include, in most cases, only the operations function and the managerial roles and functions are not fully clarified. There is a need for more in-depth analysis of how the incident management systems should function for OSR in Russia.

The Environment Agency of Iceland (EAI) is responsible for initiating oil-spill response and is in charge of operations in Iceland. The EAI has an Ocean and Water Team, responsible for marine and freshwater quality, under the Department of Nature, which is directly subject to the Director of the EAI. The EAI can request that the local Health Committee go to the site of emergency to evaluate the extent of pollution and assess necessary actions. The ICG is responsible for monitoring Iceland's marine areas for acute pollution. The Icelandic Transport Authority (ITA) is responsible for monitoring the quality of pollution prevention equipment on board vessels and assists in clean-up operations in offshore areas. The EIA has an agreement, signed in 2006, with a private oil distribution company called Olúdreifing on response and

clean-up. Olúdreifing is responsible for storing equipment and training personnel to use it. Any business or operators that can cause pollution shall have a response plan for acute pollution and this plan shall be ready and available before issuing an operating license. The EAI can request an examination of vessels, tankers and platforms at sea without a court order, if there is suspicion of danger to the environment.

As shown, the oil spill response systems in all the countries are quite complex, with many institutions and private companies involved. Making more simplified organizational structures are at hand.

To have the right type of equipment and handle it right is a challenge in this region, with different types of equipment at hand. It is important to learn more about how oil is behaving in an Arctic context and how to handle it, what kind of equipment and best practices do exist, and test a major oil spill incident through exercise in realistic conditions winter time in remote waters together with relevant local stakeholders, national authorities and neighboring countries.

### **Firefighting**

Major ship fires or explosions can have significant consequences for both people, the vessel and cargo, and the environment. The efforts of the crew in starting firefighting is important. However, the capacity is limited, and fast allocation of external firefighting assistance is crucial. Ship fires are complicated, and much training is needed. Thus, there are limitations in the number of personnel trained for firefighting at sea.

Most nations have established Maritime Incident Response Group (MIRG, RITS in Norwegian) teams trained for special maritime SAR situations and smoke diving on board vessels to support rescue measures and firefighting carried by the ship's crew. The main task for MIRG teams is to first and foremost concentrate on search and rescue of passengers and crew, who may have been trapped by fire, smoke and fire gases. Some MIRG teams are also specially trained and equipped to handle incidents involving hazardous and noxious substances.

In Russia, firefighting at sea is part of the USSoEPR subsystem. Russia has several levels of fire services. Responsibility for maritime SAR operations including firefighting belongs to the Federal Marine and River Transport Agency (RosMorRechFlot), which reports to the Ministry of Transport. Maritime operations are ensured by RosMorRechFlot via MorSpasSluzhba (State Maritime Rescue Service) and its regional branches. MorSpasSluzhba has vessels and equipment to provide firefighting at sea. The firefighters and rescuers of state and regional fire service can be involved in firefighting at sea. All missions are coordinated by EMERCOM's crisis management centers of the federal, interregional or regional level according to the severity of the crisis. EMERCOM has fire vessels and equipment to be used in coastal zones. The Northern Expeditionary Unit of rescue and salvage operations ensures navigational safety of fishing vessels and perform firefighting and search and rescue operations in the areas of fishing. Professional response to put out fires at sea demands a great deal of preplanning by the fire service to set up an emergency response team for such purposes. Like Norway, Russian fire brigades also activate the Incident Command System for firefighting situations on shore. The amount of experienced personnel for firefighting in open sea is limited.

In Iceland, firefighting in marine emergencies falls under SAR services in the Icelandic preparedness system, so the Icelandic Coast Guard (ICG) coordinates firefighting response in Iceland's search and rescue region. Firefighting at sea is subject to the national government

but firefighting on land is the responsibility of the municipalities and therefore all professional firefighters are municipal employees. There are no official agreements, plans or regulations for firefighting at sea in Iceland. Reykjavik Capital District Fire and Rescue Service (SHS) and ICG cooperated on a report reaching the conclusion that a formal agreement should be made for firefighting at sea.

Maritime incident response training is expensive and extensive and preliminary work on a co-operation agreement between the government and fire stations is underway. Recently the ICG has emphasized the importance of implementing a plan, such as MIRG, in Iceland. Both the ICG and SHS have emphasized the importance of formalizing maritime firefighting education, equipment and procedures, through an official agreement similar to those found in neighbouring countries. Coordination and implementation of such an agreement would have to happen with the support of the government. Budgetary issues and the difference of ICG being a governmental organization and SHS being a municipal organization might contribute to the fact that a formal agreement between the fire brigades and coast guard has not been made yet for maritime firefighting.

A Nordic RITS (MIRG) forum has also been established to strengthen cooperation and preparedness in Nordic MIRG services including information exchange, and developing practical operations, training and exercises. When discussing whether to establish a similar forum in the Arctic, one has to consider the viability of such services in the region and also the differences in the fire and rescue system in the Arctic countries. Considering that the systems for firefighting at sea in Iceland, Russia and Norway are different, training Norwegian MIRG teams and Icelandic and Russian fire brigades is important, focusing on familiarization with their systems, firefighting procedures, and communication and coordination solutions would be essential in order to achieve efficient coordination in multinational operations.

### **Violent action response and counterterrorism**

There is not much experience with violent action situations and counterterrorism operations at sea in the Arctic region. These situations require close cooperation between the law enforcement agencies, armed forces, coast guards and other emergency preparedness authorities, in addition to the captain. Violent action situations at sea may also involve injured passengers or vessel crew and therefore the SAR authorities will have to be closely involved in law enforcement operations.

Outside 12nm, the coastal state has no police rights to respond to violent actions or terrorism on board vessels flying a flag other than their own. The law enforcement does not have authority to board vessels flying foreign flags unless there is a violation of Art. 56 of UNCLOS or a request. Vessels in international waters are legally subjected to their flag state law, and the responsible person is the captain. If the national authorities receive an official request of assistance from the flag state, they will respond in the appropriate manner. The flag state can authorize a nation to take actions against attackers on board a vessel in international waters. The authorities have some jurisdiction to act on their own if there's an imminent threat of acute pollution which would endanger the ecosystem or other national resources.

In Norway, the district chief of police is in charge of all violent action response including terrorism. The national special force of the police and the military special forces will be activated at sea. In case of a violent action incidents at land, the police's standard procedures are described in the document "National Procedure – Emergency Institutions cooperation in Ongoing Life-threatening Violence (in Norwegian abbreviated to PLIVO). The PLIVO-

procedure covers the interaction between involved emergency response agencies and applies to a wide range of incidents where ongoing life-threatening violence occurs. This means that the PLIVO – procedure also applies to incidents defined as ‘counterterrorism’. PLIVO procedures is more difficult to introduce at sea. Norway does not have specific procedures for the interplay between police, paramedics and the fire and rescue brigades in case of violent action and terror at sea.

The counterterrorism system in Russia is well developed and include several government bodies and authorities with various tasks within the system. The Federal Security Service (FSB) is a federal executive body with the authority to implement government policy in the spheres of national security, counterterrorism, protection and defence of the state border, protection of internal waters, the territorial sea, the exclusive economic zone, the continental shelf and their natural resources. Alongside state authorities, this service carries out counteraction against terrorism by preventing, detecting and thwarting terrorists trying to cross the state border. The Federal Border Service and its coast guard division secures national maritime traffic in Russia’s territorial waters and exclusive economic zone and participate in counterterrorism operations at sea. In counteraction against terrorism the Armed Forces of the Russian Federation may be engaged to suppress acts of terrorism in the internal waters and the territorial sea, and to ensure safety of national maritime traffic. The counterterrorism system in Russia is based on special regulations that are often considered official or professional secrets. The report indicates that the counterterrorism incident systems are strictly centralized and managed by federal authorities especially in weapon use cases.

In Iceland, the National Commissioner of the Icelandic Police (NCIP) is responsible for actions and operations against violent action situations as well as counterterrorism in Iceland and in Iceland’s territorial waters. The NCIP makes a yearly terrorism hazard assessment. Police officers and Special Forces are transported with ICG’s helicopters or patrol vessels to location. All maritime law enforcement in Iceland is dependent on ICG equipment and transport.

Combined, anti-terror operations in the Arctic maritime domain will be complex due to various command, control and coordination structures of the countries, different levels of authority and a broad range of organizations involved. For violent action and terror, political and military tension and classified procedures may hamper cooperation across borders.

Deeper analysis of operational patterns and roles between institutions is complicated to analyze as there is not much information publicly available on counterterrorism and violent action situations at sea. Relevant topics for training in this regard would be joint operations including SAR services and law enforcement authorities with an emphasis on roles and responsibilities in each sector and how cooperation with incident command, control and coordination would evolve in maritime incidents involving injured persons and other critical aspects.

Thus, although the emergency preparedness systems are well developed and function adequately with respect to each nation’s characteristics and goals, there is still room for preparations through exchange of knowledge and training for joint multinational task forces in the Arctic context.



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