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Safety at sea: a pre-study on Swedish MIRG service capacity and development



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Project title

Safety at sea: a pre-study on Swedish MIRG service capacity and development

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Svensk sammanfatttning

Maritime Incident Response Group (MIRG) grundades efter branden på passagerarfärjan M/S Scandinavian Star 1990 och utför sjöräddning i svenskt territorialvatten och ekonomisk zon. Några nyliga exempel på insatser där MIRG deltagit är bränderna på Almirante Storni (SHK 2023:01) och Stena Scandica (DMAIB, 2023).

Den här rapporten presenterar en förstudie som genomfördes på initiativ av Svensk Sjöfart. Studien undersökte potentiella gap mellan nuvarande och önskad MIRG-förmåga, med syftet att hitta områden där ytterligare forskning och utveckling behövs. Projektet finansierades av Lighthouse och av Stiftelsen Sveriges Sjömanshus. Huvuddelen av projektet utgjordes av tre workshops: två SWOT-analyser (Styrkor, Svagheter, Möjligheter och Hot) och en fokusgrupp. Aktiviteterna samlade deltagare från svenska rederier, räddningstjänst, Sjöfartsverket, Kustbevakningen och Myndigheten för Civilt Försvar (MCF).

Deltagarna var eniga om att MIRG erbjuder en viktig tjänst som bör bibehållas i framtiden. Under projektets workshops noterades ett antal utmaningar och möjligheter för den framtida utvecklingen av MIRG. Följande behov identifierades:

- Definiera tydliga mål och förväntad kapacitet för MIRG, grundat på en behovs- och riskanalys
- Göra en översyn av MIRG:s styrning och finansieringsmodell
- Bedöma tillgängligheten för MIRG, särskilt i glesbefolkade områden – geografisk spridning av MIRG-grupper, transportmöjligheter och operativ uthållighet vid längre insatser
- Granska kommunernas förutsättningar för att upprätthålla MIRG-förmågan, t.ex. vad gäller tillgänglig personal, resurser och tid
- Harmonisera insatsledningssystemen för sjöräddningens aktörer, förstärka kommunikationen under insatser, och stärka kunskaperna om olika aktörers roller och ansvar vid olyckor
- Ökat kunskapsutbyte mellan MIRG, andra räddningsaktörer och rederier, även över de nationella gränserna
- Ökad träning för organisationsöverskridande samarbete vid insatser, samt för insatser på fartyg av varierande typ, design och installerad teknik.

I studiens slutsatser föreslås framtida forskning och utveckling inom områdena riskanalys och kravställning, internationell benchmarking, analyser av träningsbehov och lämpliga utbildningskoncept, lösningar som förstärker insatsledning och samarbete, samt kunskapsutbyte mellan sjöräddningsaktörer och rederier i den svenska maritima sektorn.

Summary

Founded in the aftermath of the fire on passenger ferry M/S Scandinavian Star in 1990, Maritime Incident Response Group (MIRG) units perform maritime search and rescue (SAR) within Swedish territorial waters and economic zone. MIRG was recently deployed to the fires on board Almirante Storni (SHK 2023:01) and Stena Scandica (DMAIB, 2023).

This report presents a pre-study initiated by the Swedish Shipowner's Assocation investigating potential gaps between current and desired levels of MIRG performance, with the aim to identify areas in need of further research and development. The study was financed by Lighthouse - Swedish Maritime Competence Centre and the Swedish Mercantile Marine Foundation. The main project activities consisted of three workshops: two SWOT (Strengths, Weaknesses, Opportunities and Threats) analyses and one Focus Group. These workshops involved decision-makers, operative personnel and ship operators from the Swedish rescue services, Maritime Administration, Coast Guard, and Swedish Civil Defence and Resilience Agency.

Participants shared the opinion that MIRG offers an important service that should be sustained in the future, although a number of present and future challenges and opportunities were noted. Participants saw the need to:

- Define clear goals and expected capabilities of MIRG, informed by needs and risk assessment
- Review MIRG governance and funding structures
- Assess MIRG availability, especially in remote areas - geographical distribution of units, means of transportation and operational endurance in longer missions
- Review conditions for MIRG service management and upkeep at the municipal level, i.e., availability of personnel, resources and time
- Harmonize response management systems of rescue stakeholders, including clear lines of communication and increased shared awareness of stakeholder roles and responsibilities in emergencies
- Increase exchange of knowledge and experiences between MIRG, other rescue stakeholders and ship operators, also across national borders
- Increase training for multi-stakeholder collaboration and variations in ship types, designs and technologies.

Further research and development is suggested within the areas of risk assessment and operational requirements, international benchmarking, training needs and concepts investigation, support for mission leadership and collaboration, and exchange of knowledge between SAR actors and shipping companies in the Swedish maritime sector.

Contents

1 Introduction

This report presents the results of a pre-study initiated by the Swedish Shipowner's Association, targeting the Swedish Maritime Incident Response Group (MIRG) service. The study was financed by Lighthouse and the Swedish Mercantile Marine Foundation.

Founded in the aftermath of the fire on passenger ferry M/S Scandinavian Star in 1990, MIRG units perform maritime search and rescue within Swedish territorial waters and economic zone, with recent deployments to the fires on Almirante Storni (SHK 2023:01) and Stena Scandica (DMAIB, 2023). In discussions leading up to the project, MIRG stakeholders reported a need to review the current organization and investigate how its effectiveness might be increased, i.e., to identify potential gaps between current and desired levels of performance. During development of the project application, it was established that the study should cover both the practical working conditions of MIRG units and the needs of ship crews in distress.

The study had a sociotechnical point of departure, meaning that project activities engaged actors representing various stakes in the MIRG service (operative personnel, decision-makers and ship crews), and that it covered both technical and organizational issues in relation to MIRG. The purpose of this pre-study was to consolidate perspectives and experiences from a wide range of individuals engaged in the MIRG service and lay the foundation for extended research, investigations and development. The bulk of project activity was carried out in the form of three workshops. In these workshops, stakeholders from the Swedish maritime cluster, civil protection and preparedness services, as well as regional rescue services, explored the current service portfolio and future prospects of MIRG. The results from those workshops are the main materials presented in this report.

1.1 Reading guide

This report is split into six chapters. Chapter 2 offers a brief background to the development and implementation of the MIRG service. Chapter 3 describes the study and its design. Chapter 4 presents the results of three workshops (involving personnel from MIRG management & control, MIRG operations and ship operations respectively), following the structure of the workshops themselves. Chapter 5 contains a discussion of the project results, and Chapter 6 offers conclusions and recommendations on further MIRG research and development.

2 Background

This chapter presents the current MIRG concept, its history and its legal framework.

2.1 From RITS to MIRG

In the aftermath of the fire on passenger ferry M/S Scandinavian Star in 1990, the Swedish Civil Contingencies Agency (then Räddningsverket, as of 2026 the Swedish Civil Defence and Resilience Agency (MCF) was tasked by the government to create a capacity for search and rescue at sea, entering into agreements with the Swedish Coast Guard and the Swedish Maritime Administration (SMA). This led to the formation of RITS (Räddningsinsatser Till Sjöss, Rescue Operations at Sea) with units based in five regions – Stockholm, Gothenburg, Malmö, Helsingborg, and Härnösand and Kramfors. (MSB, 2010). The following years saw several revisions of RITS, going from a maximum coverage in six geographical regions to the current organization involving the rescue service associations Greater Stockholm, Greater Gothenburg and Eastern Blekinge. In the course of these re-organizations, RITS was renamed Maritime Incident Response Group (MIRG) in line with the international denomination for maritime search and rescue teams.

Municipalities enter into agreement with the SMA to uphold the MIRG capacity and readiness, including the procurement and management of equipment and materials. Special training for MIRG operators is arranged by MCF.

Each MIRG unit is composed of six firefighters who have received special training in maritime rescue operations and firefighting in maritime environments. These units have the overall objective to assist ships where the crew has exhausted their means of controlling a fire. MIRG units are commonly transported by Search and Rescue (SAR) helicopters to the scene, but other means of transport may also be used depending on the circumstances.

Two recent ship fire incidents were frequently referred to in the project workshops. Almirante Storni was a German bulk carrier loaded with timber which caught fire while bunkering outside of Gothenburg, Sweden, in December 2021 (SHK 2023:01). Stena Scandica is a Swedish ro-ro passenger (RoPax) ferry that experienced a car deck fire and subsequent blackout while sailing outside of Gotska Sandön, Sweden in August 2022 (DMAIB, 2023). Swedish MIRG units provided support in both incidents.

Regulation of SAR and ship firefighting capabilities

2.2 SAR regulation

National SAR regulations are mandated by the International Convention on Maritime Search and Rescue (often referred to as the SAR convention, IMO 1979), an IMO treaty obligating the parties of the convention to establish maritime search and rescue services, coordinating rescue among governmental organizations. Fulfilling the convention involves the creation of rescue coordination centres and rescue units that are capable of responding quickly to distress calls. The SAR convention states that rescue units shall be provided with facilities and equipment appropriate to their tasks, and that the SAR organization (and operations, when necessary) shall be coordinated with neighbouring

states. The convention also establishes grounds for SAR operating procedures including overall coordination, on-scene coordination and command, and practical guidance around rescue operations from start to finish. The overall ability to conduct SAR is also mandated by International Convention for the Safety of Life at Sea (referred to as SOLAS convention) (IMO, 1974), stating that each contracting government should ensure distress communication, rescue coordination and adequate rescue operations at sea around its coasts. This includes the establishment of necessary search and rescue facilities, taking into account the density of seagoing traffic and navigational dangers.

To support equal SAR performance internationally, the IMO together with the International Civil Aviation Organization (ICAO) have developed the International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual (1999). This three-part document provides guidance on the organization of national SAR systems, mission coordination and practical execution of SAR services.

The Swedish state and municipalities are mandated by the Civil Protection Act (SFS 2003:778) to establish capabilities that can prevent and mitigate crises and disasters. The law includes general provisions regarding the organization of rescue services, such as the formulation of municipality action plans including risk assessment, and the dimensioning of resources to manage rescue operations. All of these capabilities are to be effective both in peacetime and in times of crisis or war. The law gives permission to the government, a municipality or government authority to seek help from and to provide help to Denmark, Finland, Iceland and Norway, according to existing treaties.

In relation to maritime accidents, the civil protection act stipulates that a state department shall be responsible for maritime rescue under the umbrella term "state rescue services". Maritime rescue applies to life-threatening incidents within Swedish territorial waters and within the Swedish Exclusive Economic Zone, including the great lakes Vänern, Vättern and Mälaren, excluding streams, channels, ports and smaller lakes. In the act, responsibility for maritime rescue is assigned to the SMA. The administration is supervised in this capacity by the MCF, which is also to guide and inform the municipalities around the fulfilment of the law. The Civil Protection Ordinance (SFS 2003:789) provides more detail around the organization of maritime rescue. This ordinance specifies that maritime rescue operations shall be coordinated from the Joint Rescue Coordination Centre (JRCC). The SMA is also tasked with creating a program for maritime rescue including and accounting for existing and planned maritime rescue resources, and plans for collaboration between municipalities, regions, government authorities and involved organizations.

On a more general level, The Preparedness of Government Agencies Ordinance (SFS 2022:524) states the responsibilities of certain governmental authorities in peacetime crises and situations of heightened state of alert. The relevant parties, including the SMA, are referred to as "emergency authorities", and should be able to withstand threats, prevent vulnerabilities and maintain operations, both in peacetime and times of crisis. Peacetime crises are defined as situations that deviate from normal conditions, threaten large number of people or significant parts of society, cause severe disruption of public services, and require rapid and coordinated response from several actors. The ordinance, SFS 2022:524, requires emergency authorities to collaborate internally and externally, ensure technical readiness and means of communication, develop capabilities, build up sufficient resources, train their staff and take part in joint emergency training, and learn

from past events. In addition, emergency authorities should also conduct regular risk and vulnerability assessments investigating threats to, and contingencies for, any critical infrastructure that falls under their jurisdiction.

2.3 Maritime regulation

According to Swedish maritime law (SFS 1994:1009), the master of a ship in distress is required to do anything in their power to rescue the people on board, the cargo and the ship itself, and must not leave the ship as long as there is a reasonable opportunity to save it, and as long as their life is not in grave danger. This law also mandates any ship in the vicinity of a casualty to assist to the best of its ability. All passenger ships and other ships with a gross tonnage (GT) above 20 GT are mandated to have a safety organization with crew members having certified competence in firefighting.

SOLAS (IMO, 1974) describes mandatory fire safety measures for cargo and passenger ships, with an emphasis on technical safety measures pertaining to ship design features and equipment meant to prevent or limit the spread of fire. SOLAS also requires ships to organize parties responsible for firefighting, and states that these parties shall have the capability to complete their duties at all times while the ship is in service. The SOLAS convention establishes the master's discretion in making decisions and taking actions to protect life at sea or the maritime environment. Safety management on board is mentioned in SOLAS with reference to the International Safety Management (ISM) Code (1993). The ISM Code covers general ship safety management such as safe operational practice, risk assessment, emergency preparedness and continuous improvement. This code once again establishes the master's overriding authority in making decisions relevant to safety and pollution prevention.

Demands on crew and officer fire management competencies are established in the International Convention on Standards for Training, Certification and Watchkeeping (STCW) (IMO, 1978). This convention requires that any seafarer who is part of the fire safety organization on board must go through basic safety training as part of their certification. Members of the crew that are designated to lead firefighting operations must also complete advanced firefighting training, which has an emphasis on firefighting tactics and command.

3 Methodology

This study utilized a qualitative and exploratory approach. Three online workshops were conducted engaging a total of 29 participants, using Microsoft Teams (Microsoft, 2025) and Miro online whiteboard (Miro, 2025).

Each workshop addressed a specific group of stakeholders. Workshop 1 focused on management and control of the MIRG service, workshop 2 addressed the MIRG operational perspective, and workshop 3 explored the perceived needs of active seagoing personnel and representatives from Swedish shipping companies.

Workshop 1 and 2 employed "Strengths, Weakness, Opportunities and Threats" (SWOT) analyses while Workshop 3 had the format of focus group. Participants, procedures and analysis of material are further described in the following sections.

3.1 SWOT analysis

In workshop 1 and 2, SWOT analyses were used to explore current challenges and future opportunities for MIRG. SWOT was developed in the late 1960s to facilitate strategic planning for organizations under change (Hill & Westbrook, 1997). Encouraging a holistic and systematic approach, SWOT analyses support organizations in achieveving a good fit between external, or contextual, factors (called threats and opportunities in the analysis) and internal characteristics of an organization (strengths and weaknesses). The aim of a SWOT analysis is to provide support in complex decision-making processes by ordering and reducing the amount of information available to guide the decision makers (Arslan & Turan, 2009). The first publications using SWOT analyses stem from the 1960s, but the origin itself remains unknown according to Helms and Nixon (2010).

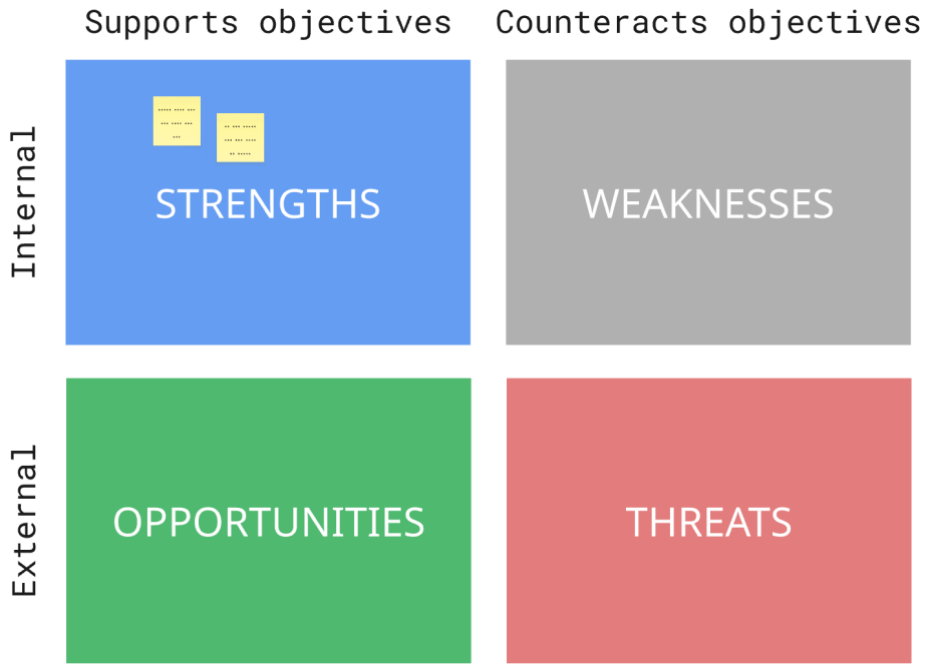

Figure 1 – Example of a SWOT interactive workspace

While traditionally utilized for strategic management decision and policy development, within recent years, the SWOT method has been applied to a large variety of domains and problem spaces. Some examples exist of applying the method within the maritime

domain. Arslan & Turan (2009) used SWOT to enhance safety analyses and risk reducing measures for marine casualties in the Istanbul Straight, combining SWOT with the Analytical Hierarchy Process (AHP) method. Other authors have suggested improvements to institutional efficiency in maritime higher education based on questionnaire data analyzed with the help of the tool (Paraggua, Mobo, Acuavera, Villavicencio & Pasa, 2022), and SWOT has been used to identify what constitutes successful bridge team organization (Arslan & Er, 2008). Finally, Praetorius, Hult and Sandberg (2020) used SWOT to explore how Swedish shipping and maritime education & training (MET) organizations in Sweden can meet challenges and seize opportunities in the current transition of maritime operations towards a higher degree of automation and autonomy on a national and international level.

3.2 Focus group

Workshop 3 employed a focus group method to gather perceptions from individuals engaged in ship safety organizations, i.e., people who may encounter MIRG units and the wider SAR network in the event of an on-board fire.

A focus group brings a selected group of people together for an informal discussion, sometimes on the basis of pre-defined questions, guided by one or several moderators. The purpose of a focus group is to allow a multitude of opinions, perceptions and experiences to a specific topic into the discussion. Participants are encouraged to interact freely with each other. This interactive dynamic allows them to identify shared views, divergent perspectives, and underlying assumptions that may not surface in individual interviews. This method is commonly used for gathering information and building knowledge at the early stages of research (Acocella & Cataldi, 2021).

3.3 Workshop participants

Workshop 1 involved personnel active in the management and control layer of the MIRG service, representing the SMA, regional rescue service associations, the Coast Guard and the MCF. The workshop engaged a total of 12 participants, including 3 moderators.

Workshop 2 gathered operational personnel within the organizations that are part of MIRG: MIRG operators and commanders, SAR coordinators and helicopter personnel from the SMA, and Coast guard operators and administrative personnel. A total of 13 participants, including 2 moderators and one observer, participated in the workshop.

Workshop 3 brought together shipboard and land-based personnel from Swedish shipping companies (roles of captain, chief engineer, Designated Person Ashore (DPA), and marine superintendent), representing Ro-Ro, PCTC, Ro-Pax and tanker shipping. The workshop was also attended by a representative from the Swedish Shipowner's Association. A total number of 12 people including 3 moderators attended the workshop.

3.4 Workshop procedures

In workshop 1 and 2, participants were given an introduction to the project, the SWOT method, and the aims of the workshop. Participants then transitioned to the online Miro tool, where a workspace had been prepared representing the four dimensions of SWOT.

The workshop addressed each dimension in turn. For each block, participants initially worked individually for 10-15 minutes, jotting their reflections on digital sticky notes. After this followed a period of approximately 20 minutes where participants discussed the contents of the notes and grouped them into categories. At the end, participants reported their main concerns and take-aways in a summarizing discussion.

Workshop 3 was organized in the form of a digital focus group discussion involving crew members from Swedish shipping companies who shared their field experiences and discussed their perceptions of the MIRG service. After an introduction, participants worked through a set of questions prepared by the moderators. The format was similar to the previous workshops: participants first worked individually to answer each question by recording their reflections on digital sticky notes, then discussed the various responses jointly. The following questions were used to structure the workshop:

1) Is MIRG needed?
2) What kind of assistance do you wish MIRG to provide?
3) What are your expectations on MIRG?
4) What is demanded for smooth collaboration with MIRG? And
5) How may collaboration with MIRG be strengthened?

3.5 Analysis of materials

All workshops were recorded in Microsoft Teams and transcribed verbatim using the Whisper AI transcription tool (OpenAI, 2025). Results from the AI transcriptions were checked against meeting recordings in cases of uncertainty or obvious error. Analyses rested on these transcriptions together with the notes made by workshop participants in Miro, and side notes taken by the moderators.

The analysis consisted of qualitative data coding (Gibbs, 2018), an inductive process where materials are sorted under common themes. The sorting of the Miro board sticky notes made during the workshops served as a starting point for categorization. Second, an inductive content analysis of the verbatim transcripts was conducted to provide more detailed descriptions of what had been captured in the online whiteboards. This also made it possible to trace discussions among participants. Coding continued, refining previously identified themes, until arriving at the structure presented in the Results chapter of this report.

In the process of coding the materials, all overt references to individuals were removed.

4 Results

The following sections present the coded findings from the analysis of workshop materials. Each workshop is presented under its own heading. For workshop 1 and 2, the SWOT elements have been used to structure the contents. Subheadings represent the categories produced by the qualitative coding of materials (see section 3.5).

4.1 Workshop 1 – MIRG management & control

Workshop 1 was concerned with the management and control of the MIRG capability, involving participants working within the SMA, Rescue Services, Coast Guard and Swedish Civil Contingencies Agency.

4.1.1 Strengths

Among the participants of workshop 1, there was a strong consensus around the strategic benefits of the MIRG service. Having specially trained personnel available at all hours was described as a great strength, and the cost of upholding this capability was perceived to be low, given the way MIRG leverages existing resources within municipal rescue service organizations.

Participants emphasized the high level of competence among MIRG operators. This specialized expertise, it was argued, not only enhances the operational performance of the units themselves. It also helps strengthen shipboard firefighting competence across the collective of firefighters in the municipalities where MIRG units are present. This may, for example, improve preparedness for ship fires in port. A similar side-effect was mentioned in relation to collaboration between response organizations. Within the MIRG concept, different organizations contribute with different types of resources (i.e., personnel, leadership, transport and materials), and as they cooperate around MIRG operations and exercises, the overall response system is strengthened.

4.1.2 Weaknesses

Issues related to governance

In workshop 1, the majority of discussions about weaknesses revolved around the governance and mandate of the MIRG service. Participants stated that MIRG is not supported by the constitution, nor by appropriate directions, and that authorities should normally not act outside of what the constitution stipulates. MIRG, organized by the state but operated by the municipalities, is an exception to this rule. Participants stated that the existing division of responsibility between state and municipalities is partly unclear, something that has consequences on the operational level.

Barriers to continuous development

A consequence of the perceived unclarities regarding authority and ownership for MIRG is that continuous development, such as technical evolution, exercises and training, may suffer. According to the participants, the SMA has had to cut costs, and the resources needed to uphold MIRG service are sometimes questioned. On the municipal level, on the other hand, participants noted that financing of MIRG activities and development has improved compared to some years back. It was, however, also mentioned that municipalities employ different models when calculating what compensation to request

for upholding the MIRG service, leading to differences in funding between regions. In the workshop, participants suggested that a shared model for calculating costs and applying for financing should be established and jointly applied by both municipalities and the state.

Participants held that there is a standing need to investigate and procure new equipment for MIRG, to organize replenishment and servicing of materials, and to expand training. Within the municipalities, however, allocating sufficient resources to MIRG development may be challenging, not only from a financial point of view, but also in terms of freeing up the required personnel. In this context, the rescue services are sometimes met with local political resistance. Here, the SOLAS convention has been used as an argument for holding back further development, on the grounds that ships (according to the convention) should have their own fire safety organization.

Uncertainty around collaboration

According to participants, unclarities around the governance of MIRG have consequences at the operational level. One participant noted that the different MIRG stakeholders have different cultures, forms of financing, responsibilities and ways of working, and those differences affect their expectations on how MIRG should function. One example mentioned was the interpretation of "alert plans" (the strategy for allocating and calling rescue resources to the scene of an incident). General rescue service practice is to immediately call all available units to the scene of an accident, later recalling units as they are deemed redundant, but this has not been the practice of MIRG. In the case of Almirante Storni, for example, it was the opinion of the participants that MIRG in Stockholm became involved too late. Some participants, however, argued that following the rescue service practice (i.e., always calling all MIRG units) would lead to vulnerabilities, should additional incidents occur within the same time frame.

Recent incidents, such as the fires on Almirante Storni and Stena Scandica, have pointed to the need for improved collaboration and leadership structures in multi-party response operations. In the workshop discussions, it was suggested that amongst the MIRG unit members, few are probably aware of the exact leadership structure in multi-agency emergency response. There was a suspicion that this lack of knowledge is also present in other stakeholder organizations. It was also mentioned that there have been several investigations into management and collaboration among Swedish land-based fire and rescue services following on the large forest fires of 2014, but that state emergency services have not benefited from the same kind of development.

Lack of general capacity and geographical coverage

As described by participants, the decision to concentrate MIRG to three rescue service organizations in the southern part of Sweden was made based on the placement of harbors, ship traffic patterns and corresponding risks. This imposes tactical constraints in the event of an accident. An accident in the north would likely place large demands on helicopter transport, but airborne transport may sometimes be limited by weather conditions. Additionally, because of the small total number of MIRG units nationally, units from all three regions need to be called at once to guarantee that personnel can be relieved. Nevertheless, if a mission extends over a longer period of time, these units may easily become depleted. In addition, participants stated that the decision to concentrate units to the south may need to be re-evaluated in the light of current developments

within the total defense domain, if that work demonstrates a larger need of MIRG preparedness in the north.

Lack of transport capacity

Transporting MIRG units to the scene of an incident typically involves the use of SAR helicopters. In this context, participants noted that the currently used helicopters are smaller than those used when the RITS/MIRG service was created, meaning that the loading plan (i.e. what equipment to bring) needs to be scrutinized in detail and adapted to perceived needs. For longer transport, helicopters may also require refueling, adding to the response time of MIRG units. This is particularly true for the northern parts of Sweden, where the distance to MIRG units is much longer.

Lack of learning

Under the topic of weaknesses, several participants made comments related to training and learning. Actual MIRG responses are few, and thus there are few opportunities to learn from practice. According to participants, conducting more joint training, involving MIRG units from all three regions, has been an ambition for several years. It was noted, however, that it can be difficult to gather all the relevant resources for large-scale exercises. Here it was suggested that a more flexible format is needed, allowing for more frequent exercises at various locations. The main barrier to realizing such a concept was perceived to be economic constraints. It was also held by participants that there is a need to review MIRG training on a more general level, creating clear goals, learning objectives, and updated training schemes.

Similar observations were made concerning collaboration with MIRG services in neighboring countries. Participants stated that there have been very few instances of training for multinational collaboration. Since different countries have different rulesets as well as different operational methods for SAR, problems could occur in a situation where collaboration is needed.

In relation to learning, it was also noted that although recent accidents such as the fires on Almirante Storni and Stena Scandinavica were subject to investigations, there is no existing mechanism to systematically review MIRG operational performance, exchange evaluation results between organizations, and to make use of such information for development purposes. For land-based rescue service operations, an after-action report is always produced, but there is no equivalent practice in the case of state emergency rescue. To the extent that municipal rescue services perform reviews after MIRG missions, participants stated that they tend to focus on their own organization, meaning that experiences concerning multi-actor collaboration are not reviewed. Resources for conducting this type of evaluation are currently limited, and up until now it has not been prioritized by the SMA. In addition, there is no organized distribution of lessons learned to other municipalities that do not host MIRG units, even though such information could be valuable.

4.1.3 Opportunities

New forms of governance

On the topic of opportunities, discussions again focused on the governance of state rescue services. Participants argued that MIRG should be a national assignment from the

government and part of the national preparedness strategy, with financing through governmental grants, similar to developments within other fields, such as disaster medicine. Such a reorganization would require a reassessment of the utility and potential needs for MIRG interventions on a national level, clarifying the level of ambition and corresponding dimensioning of the MIRG service. According to several participants, the current forms of governance and financing of MIRG are the core of many of the experienced problems. On the other hand, it was also stressed that the current MIRG service has many strengths and that the organization has built a substantial amount of experience, resources that should be leveraged if the organization is restructured. In addition, a high level of commitment to MIRG was reported at all levels of the organizations involved in the workshop.

On the operational level, participants stated a need to review and develop operational management for state emergency response, as well as to harmonize the management systems across authorities and agencies in a way that better supports leadership and multi-stakeholder collaboration in MIRG interventions. One example given in this context was the need to determine more exact procedures for port of refuge, so that a coherent operative leadership is maintained from the scene of the accident all the way to port.

Investigations of recent maritime fire incidents have also identified a need to further develop operative leadership and collaboration. Participants felt, however, that these investigations have not fully captured all relevant challenges related to the coordination of SAR stakeholders, and that no authority is currently pursuing these questions further. In this context, the possibility was mentioned to develop management systems in line with "enhetligt ledningssystem för kommunal räddningstjänst" (ELS, unified management system for municipal rescue services) and to review the cooperation framework "Gemensamma grunder" ("common grounds", a framework for crisis collaboration) developed by MCF, possibly refining it in order to capture the nature of MIRG operations.

Transport of MIRG units and resources

Transport of MIRG units was identified as a substantial weakness in earlier discussions, but discussions only briefly addressed potential areas of development. One opportunity mentioned was to make use of helicopters owned by other actors, such as the military, police and civilian organizations, although such helicopters may not always allow firefighters to rappel down to the ship in distress. It was concluded that more investigation is needed to address this issue, and that transport concept choices are heavily dependent on other developments regarding MIRG organization, strategies, and procedures.

Development of training

On the topic of training, participants stressed that although incidents in the waters surrounding Sweden may occur close to other countries national borders, there have been very few examples of joint exercises involving MIRG groups from different countries. Participants noted that initiating such cross-border exercises within the Nordic region presents a clear possibility, and that a similar need to train collaboration and leadership within multi-stakeholder incident response also exists at the national level.

As a way of making more use of MIRG competence, participants saw opportunities to increase MIRG operator involvement in shipboard firefighting training for land-based firefighters.

Increasing MIRG utilization

Participants suggested a few ways of reinforcing MIRG by linking up to developments in the defense area. First, MIRG could be considered in relation to national total defense, where it might be possible to argue for expanded MIRG coverage. In discussions it was argued that the demand for MIRG services is likely to increase as civil defense and defense cooperation receive more attention, but that any such involvement would need to be investigated as part of a larger review of MIRG responsibilities. One opportunity mentioned within this context would be to review the project "Räddningstjänst under höjd beredskap" (RUHB, rescue services in high alert situations) from the perspective of MIRG engagement. According to participants, however, discussions about total defense and firefighting capabilities have so far mainly addressed interventions on land.

A second possibility mentioned in the workshop would be to frame the MIRG service as a NATO issue, e.g., the ability to assist neighboring NATO countries in times of crisis. According to workshop participants, there is currently no focus of firefighting capabilities at sea in ongoing work on NATO Readiness Measures (RM).

In the local perspective, it was suggested that MIRG units could also be employed to fire incidents in municipal areas, such as ship fires in ports, lakes or inland waterways. This would serve both to maintain MIRG competence and boost cooperation between MIRG and land-based rescue service assets.

Defining level of ambition and core requirements

Summarizing the discussion on opportunities, participants argued that in order to determine appropriate governance, financing and organization of MIRG, there is a need for the government to review the MIRG service in detail. This would need to entail a thorough analysis of operational requirements based on both current and future operational contexts of MIRG, clarifying the types of threats and operational circumstances that MIRG units are likely to face in a longer time perspective. One document referred to in this discussion was the newly published Mass Rescue Operations Guidance from the International Maritime Rescue Federation (IMRF, 2025), which is meant to complement the IAMSAR manual.

It was also noted that although regulations mandate shipping companies to maintain fire safety by both technical and organizational means, real-life experience shows that fighting a fire may quickly exhaust the capacity of a ship's crew, and that the MIRG service should be dimensioned with that in mind. Participants suggested that more information could be sought from international accidents where MIRG has played a role, both for learning purposes and to demonstrate the importance of MIRG.

4.1.4 Threats

When discussing the main threats to the MIRG service, participants once again returned to the subject of governance. In the words of one participant, Sweden has not decided whether we should have this capability, nor what level of ambition should be achieved. It was argued that due to perceived unclarities around MIRG, ensuring and developing

MIRG capabilities depends on the personal commitment of individuals in the stakeholder organizations. This engagement stems both from the idea that MIRG adds value to society and from the fact that local fire services need to be able to respond to fire incidents at sea, regardless of whether MIRG exists or not. Participants stated that many people working in rescue services share a sense of responsibility and a strong willingness to act, and that the relatively loose governance for MIRG may have been able to persist because of those organizational traits. In the municipalities, however, engaged individuals face pressures to limit MIRG development to the benefit of other needs, thus making the MIRG organization more brittle.

Due to the current situation, participants argued, there is not enough organizational learning and resources to fuel development of MIRG and to clarify how it could be optimized. This creates a kind of stalemate where the concept cannot reach its full capacity and thus becomes even more vulnerable to criticism. The context of MIRG operations is changing constantly, due to technical innovation (such as new ship fuels and cargo), political developments and dynamics in the ship traffic system. In these discussions, a fear was expressed that if the MIRG concept is not allowed to evolve, it may simply be abandoned or have its financing restricted. Several participants also commented that there have already been lengthy discussions on this topic without any clear results.

4.2 Workshop 2 – MIRG operations

Workshop 2 involved operative personnel in the MIRG service and focused on the practical work and working context of MIRG units.

4.2.1 Strengths

Support for others

According to the participants, the most important strength of MIRG is the ability to provide support for others, primarily to the crew onboard a ship in distress. Due to the cooperative nature of incident response and the closeness of stakeholder command centers, however, support can also be given to other actors in the incident response network (e.g., to the Joint Rescue Coordination Center).

People as resources

The participants emphasized that the people involved in MIRG are the most important strength. There is a high level of motivation, and MIRG collaboration has helped to establish open communication across organizational boundaries where collaborators know each other and each other's organizations well, something that benefits cooperation both during and outside of response missions.

Formal Organization

The formal organization and cooperation among different stakeholders in the MIRG were seen as important preconditions for response effectiveness. MIRG is a clearly defined concept that supports collaboration across organizational boundaries for specific purposes. The participants felt that regular meetings, documented agreements and recurring training provide the capability to handle a wide range of scenarios and types of accidents.

Expertise and competence

Participants emphasized that MIRG offers access to dedicated expertise and knowledge from different organizations to best meet adverse events. The group represents a good mix of relevant competences, and training supports mission specific behaviour and capabilities. Expertise and competence do not only support MIRG during missions but also enable knowledge transfer across organizational boundaries.

Mission specific capabilities

As stated by participants, it is a clear strength that logistics, such as e.g. means of transport and relevant equipment, to handle adverse events and complex accidents are in place enabling MIRG to respond rapidly if needed. Further, specific training and joint drills help to build a continuous collaboration strengthening mission-specific capabilities.

4.2.2 Weaknesses

The participants identified several weaknesses in the current MIRG setup that could negatively impact the capability. As MIRG operations are highly complex, with low frequency and high severity events demanding well-trained and highly skilled personnel, it was seen as important to become aware of potential weaknesses within today's system. The weaknesses identified by the respondents can be grouped into four categories: organization, routines and capability description; training; resources and equipment; and leadership and cooperation.

Organization, routines and capability description

Today, MIRG mainly consists of five organizations (three rescue services, coast guard and the SMA) that each have their own organizational structures and priorities. Sometimes it is therefore difficult to align and prioritize the MIRG capability within daily routines and work tasks, especially seeing that events requiring MIRG involvement are rare. However, as pointed out by the participants, it is problematic that while events involving MIRG operations are low in frequency, the potential consequences, both for those involved in the rescue operation and for the general public, may be severe. Scenarios demanding MIRG involvement also tend to be well-covered by the media, and as noted by one participant, there will often be a risk of catastrophic outcomes.

Further, differences in organizational structure also feed into other weaknesses, such as differences in routines in firefighting and use of equipment, as well as in how many resources from an organization can be assigned to MIRG and participate in training and the development of training materials.

Training

A lack of training (both nationally and cross-border) was one of the weaknesses most emphasized during the workshop. Participants stated that due to the current shift in national safety and security priorities, many organizations find it difficult to assign resources to joint training. For an organization to be motivated to do so, it must recognize the importance of MIRG and the need to train for low frequency, high severity events. One of the respondents also emphasized that joint exercises, especially with MIRG capabilities from other countries, contribute to learning from others and provide a basis for potential improvements.

Participants also stressed that even though rescue services have similar training and organizations, there may still be differences in routines and use of equipment. To this end, joint training serves to align procedures, checklists and ensure technical compatibility across organizational boundaries. Joint training helps to establish a common vision and work routines, features that are important in MIRG operations that involve both professional firefighters, staff from other organizations, and ship crews. Joint training may also provide the groundwork for internal organizational improvements, such as updates of training materials and checklists (e.g. "packing lists"). According to participants, these are all benefits that may affect response time and the ability to adjust to the characteristics of different incidents.

Besides training the MIRG personnel itself, it was also mentioned that the surrounding maritime cluster should be provided with better knowledge about the organization and practical work of MIRG. This could for example be included in Basic Safety training for onboard staff.

Resources and equipment

This category addresses aspects of equipment (firefighting gear, bags to transport gear etc.), materials (packing lists, training manuals and guidelines etc.), and resources (time, money, transport to site etc.) that should be available to enable a successful MIRG capability.

Participants stated that most of the equipment available today needs to be updated to modern standards. It was also mentioned that different organizations use different means of communication and that these practices do not always align during missions. There is dedicated but limited equipment for MIRG, and this equipment may not always be available for a thorough familiarization, which in turn can impact effectiveness and efficiency in operations. Further, participants stated a general need to update current materials, e.g. packing lists, training manuals and guidance documents for missions.

In terms of resources and equipment, participants also mentioned several constraints, such as long distances to an incident location, limitations to what and how much materials can be transported by helicopter, as well as a lack of time and money to support recurring training and updated guidance.

Suggestions for improvement included a more modularized approach for different scenarios where equipment, materials and resources would match specific contexts, resulting in a more flexible capability and easier transport.

Leadership and cooperation

Successful missions rely on cooperation between different organizations, as well as effective leadership on site. It was stressed that despite having very experienced personnel, the low frequency of incident response, large uncertainties and high level of risk still make this kind of cooperation demanding. In the current organization, MIRG employs a singular on-site lead, who will see the mission through from start to end. Participants discussed that since missions can span several days, it would be beneficial to reconsider the current line management and staff organization to create a potential backup and opportunities to discuss and reflect upon decisions during the mission. Some of the respondents mentioned that MIRG is currently more like a paper product than a flexible capability. Participants saw a need to increase the knowledge of roles among

organizations, to create better support for the lead MIRG rescue missions, to provide a backup for leadership during longer missions, and to establish clear lines of communication across organizational boundaries.

4.2.3 Opportunities

The participants highlighted opportunities within four main categories: increased awareness for preparedness; organizational reconfiguration and new collaborations; and training, education and information.

Increased awareness for preparedness

According to participants, the current geopolitical situation has increased societal awareness around preparedness, which may offer an opportunity for MIRG to take on a new role within the Swedish civil defence strategy. MIRG was described as a well-equipped organization which could potentially be used in other types of assignments beyond traditional fire-fighting missions at sea. As an example, one of the participants highlighted the opportunity to serve as backup function for other services working to increase maritime safety, e.g., taking part in Search and Rescue missions, or in civil response and preparedness functions.

Organizational reconfiguration and new collaborations

A major opportunity highlighted by the participants is to modularize the services and seek new collaborations to increase the combined experience and expertise to able to handle different types of events. Today, MIRG is what one participant called a "standard service package", which provides an important service, but which also has the potential to become more effective and efficient if certain capacities are added.

One possibility mentioned would be to add nautical expertise to MIRG, something that could help with the initial assessment of what resources are needed for a certain mission. Additional expertise could potentially be recruited through collaborations between MIRG and other organizations within the maritime cluster. One suggestion for strengthening nautical and technical competences within MIRG was to, for example, collaborate closer with the ship surveyors from the Swedish Transport Agency. These inspectors often have a nautical background and work in a service that is provided 24/7. During a mission, such a resource could support MIRG in the assessment of the situation and could also improve communication between MIRG and the onboard crew, e.g., assisting with maritime vocabulary.

Another identified opportunity was to increase communication between the organizations that are currently part of MIRG by introducing more regular online meetings. This would help align expectations experiences and increase organizational learning. This might also contribute to reconfigure current approaches to how the capability is organized and deployed. As one of the respondents stated, there is an opportunity to make MIRG much more efficient and effective, but it would require a clear definition of the concept, novel tactics and methodology on how to modularize the capability, as well as new forms of leadership and collaborations with other services to allow a better match between events and the response capabilities and resources needed.

Training, education and information

In order to be able to seize new opportunities and potentially answer new assignments, participants saw a need to review training, education and information for and about MIRG. MIRG relies on effective collaboration not only among the organizations represented within the service, but also with crews of ships in distress. Therefore, it was argued, information about MIRG should be integrated in the training and education of the maritime workforce. An increased knowledge of what MIRG is and what it does might facilitate cooperation during missions.

Further, training and education could potentially be made resource effective by rethinking training modalities and scope. Currently, training has an emphasis on large scale exercises which are resource intensive and, for some organizations, difficult to attend. It was therefore discussed whether training could be optimized and varied with, for example, table-top simulations. Another opportunity highlighted was the ability to engage stakeholders from the maritime domain in joint training and training design. The shipping industry is currently undergoing major changes, such as transitions to alternative fuels, battery systems, more automated operation, as well as more optimized harbour and port operations. Industry stakeholders can provide important expertise on how to adapt training to address risks and compensate for knowledge gaps in current training and education.

4.2.4 Threats

The last part of the workshop discussed potential external threats to the MIRG capability.

Concept definition and expectations

Participants suggested that since MIRG is normally only involved in a few missions every year, it may not be obvious to all actors what the service contributes with in relation to the investment it requires. Therefore, information about the service to a wider stakeholder group is of importance.

As mentioned earlier during the workshop, shipping is undergoing large changes and the participants felt that there is a lack of risk assessments targeting novel risks and demands stemming from these changes. Without revised and additional risk assessments, it will neither be possible to define knowledge and skill requirements for certain types of missions, nor to ensure that they are adequate.

In the workshop, it also became clear that there is an uncertainty around whom is responsible for knowledge and skill requirements analyses in a shifting technical and geopolitical landscape. While the fire and rescue services have expertise in firefighting, whether this activity takes place in port or at sea makes a large difference. Participants from different organizations were not in agreement about whom is to provide certain competences in risk assessment, and thus also be responsible for ensuring adequate resources and skills.

Organizational framing and work regulations

Several participants stressed that the current shift in priority towards civil defence and preparedness has affected the availability of resources. Additional tasks are gradually assigned to the different organizations in MIRG, and it could become increasingly

challenging to ensure that sufficient resources are available when incidents occur. As MIRG carries out only a few missions per year, the MIRG service may be given a lower priority on the organizational level than other tasks, such as services related to civil defence.

In addition, as services are already stretched to fulfil multiple operational and organizational goals, regulations regarding work hours and work environment were mentioned as a threat or hindrance for effective collaboration, especially with regards to training for longer missions. While exercises are tailored for the achievement of specific mission objectives, they offer less opportunity to train and test the endurance of the MIRG capability.

4.3 Workshop 3 – Ship operations

Workshop 3 followed the format of a focus group discussion, centering on ship operations and the expectations of ship crews on the MIRG service.

4.3.1 Strengthening firefighting effectiveness and preparedness onboard

Participants agreed on the fact that the level of firefighting proficiency amongst crew members will always vary, and it was noted that although firefighting training provides a certain level of proficiency, it does not compare to that of professional firefighters. On these grounds, participants expressed a clear need for backup in case of larger fires onboard, and that the availability of MIRG provides a sense of safety and reassurance.

From an onboard fire risk management perspective, the availability of the MIRG service was perceived as an essential risk control measure. The participants consistently emphasized that having an external, professional firefighting assistance available enables a more structured and deliberate application of available firefighting resources on board, thereby reducing the likelihood of an escalation of the incident.

On the contrary, in absence of MIRG support, participants feared that risks in relation to a ship fire would escalate rapidly leading to more severe consequences, and that crew stress would increase substantially.

4.3.2 MIRG capabilities in relation to the ship's safety organization

Another aspect mentioned by participants was the operational value of the MIRG service in situations where firefighting operations extend over a longer period of time. Based on experience, some participants highlighted that only a narrow time window (estimated to be between 20 and 40 minutes) may be available for the crew to extinguish a fire on board. Fire situations may escalate rapidly, risking to deplete the capabilities and resources of crew members. Under these conditions, participants argued, having MIRG support available is a major operational benefit. However, participants also emphasized that different ships may have very different needs in terms of the support requested from MIRG. Some ships may benefit from support in decision-making, while other ships primarily have a need for more manpower in manual firefighting. Similarly, some ships carry a wide range of modern firefighting equipment, while other ships may have much more rudimentary tools. This, it was argued, points to a need for MIRG to adapt their approach to the particulars of each ship and incident. The participants agreed, however, around the need to create procedures or checklists for the interaction between MIRG

and ship crews, e.g., defining roles and information to be included in information exchange.

4.3.3 Lack of geographical coverage along the coastline of Sweden

Participants remarked on the limited geographical distribution of MIRG units, particularly with respect to the northern coastline of Sweden. Some concerns were expressed regarding these comparatively extensive coastal areas, and it was feared that the current placement of MIRG units might prolong response time. In general, participants had little information around MIRG responsibilities in terms of geographical coverage, and operators from the northern region expressed an uncertainty around what to expect from MIRG in case of a fire. These northern operators were also reported to arrange their own training with local rescue services rather than rely on interaction with MIRG. It was also mentioned that given some area specific conditions, such as ice conditions, companies might seek support from other countries, such as contacting the Finnish rescue services.

4.3.4 Impact of communication issues on operational performance

Despite their overall positive perspective on MIRG, participants raised some issues in relation to collaboration with MIRG units. MIRG was perceived to rely heavily on their own procedures and equipment, rather than integrating with the crew into one response system. For example, MIRG uses the RAKEL system which works well for on-shore fire response, but tends to suffer from disruptions in onboard environments. Some of the participants also felt that there was a certain reluctance to rely on the crew's knowledge and competencies. In time-critical response missions, participants stated, interoperability and shared trust are essential factors.

4.3.5 Opportunities for mutual exchange of knowledge and expertise

The participants consistently agreed that a continuous dialogue and exchange of knowledge, expertise, and operational experience between MIRG and the operator could be beneficial for both parties, and that there is a standing need to spread information about MIRG among Swedish maritime stakeholders, such as shipping companies.

The participants stressed that for MIRG personnel to conduct effective firefighting operations, it is important for them to be familiar with different ship types and their structural characteristics. It was argued that this is particularly true for tankers, car carriers, and bulk carriers, which differ substantially in layout, design, and available onboard space. Participants emphasized that, given the time-critical nature of MIRG interventions, prior familiarity with vessel layout and design should be essential for efficient emergency response. While onboard crews will hold the most detailed knowledge of the vessel and can actively support MIRG activities, prior knowledge and familiarity were considered a clear advantage during emergency operations.

Another aspect highlighted by the participants was cultural competence and contextual awareness. Ships operating in Swedish waters represent a wide variety of flag states and ship crews are commonly multi-national. This diversity is associated with cultural differences that may also affect the onboard safety organization. Having knowledge about such differences was identified as an essential for emergency response effectiveness. Developing such an understanding, however, was described as inherently

difficult given the infrequent nature of MIRG deployments and the limited opportunities for sustained interaction with ship crews. Participants provided multiple examples where cultural misalignment might create operational barriers. It was also argued, however, that these barriers may easily be mitigated and prevented through systematic joint training, regular drills, and recurring technical forums that facilitate continuous knowledge transfer and alignment of operational practices.

5 Discussion

The workshops conducted within this project gathered a wide selection of MIRG stakeholders, including personnel in both operational and decision-making roles. Among these participants, a strong consensus around the perceived challenges, issues, and improvement opportunities for MIRG could be noted. This common understanding can be considered an advantage in the continued development of the Swedish MIRG service.

According to some workshop participants, maritime regulatory demands on shipboard fire safety installations and capabilities are sometimes used as an argument to de-emphasize the role and importance of MIRG. This argument, however, is contradicted by both historical experience and the needs and expectations stated by ship crew representatives in workshop 3. Ship crews are limited in number, and fire response teams are typically composed of crew members that vary in age and physical fitness. Even though these team members are mariners primarily, they may be deployed to fight fires in complex and cramped environments with large volumes of flammable materials and ample supply of oxygen (Bram et al., 2019). Even though ships are fitted with extinguishing systems and fire insulation to delay the spread of fire and provide more time for evacuation, it is also known that ship evacuation, in itself, is associated with many dangers (Lundh et al., 2010). Adding to the situation, maritime environmental regulation is driving a transition to more sustainable fuels, and the wide variety of technical solutions to enable this transition also produces new fire safety hazards. These facts are known to the maritime community and were echoed by participants in the operator workshop, who stated a strong support for MIRG and a wish to retain this service in the future.

Many participants from the MIRG service shared the opinion that the Swedish sea rescue function requires stronger governance. According to them, ambiguities in the existing legislation have resulted in a system where the continued development of MIRG and its operational readiness relies heavily on the personal motivation and commitment of individuals within the stakeholder organizations. Interestingly, the investigation by the Swedish Civil Defence and Resilience Agency (2010) providing groundwork for the previous MIRG re-organization echoed the same concern, stating that "Today there is no clear goal for the RITS units within maritime rescue, where their expected capability is stated" (MSB, 2010).

In the eyes of the participants, uncertainties in relation to governance may affect the practical effectiveness of MIRG, both at the management level (e.g., in relation to response management systems and leadership) and at the operational level (e.g., response times, manpower and resources).

First, MIRG operators saw the need to review the geographical distribution of MIRG units, their means of transportation, their operational endurance in emergencies that extend in time, and the way that these factors interact. In particular, lengthy missions may seriously strain MIRG's leadership capacity.

Second, participants in both the management and operational workshops expressed a need to harmonize the response management systems of rescue organizations, an area where efforts have been ongoing for some time without clear progress. Participants in all workshops shared the opinion that stakeholders need to become more aware of each

other's roles and responsibilities in emergency situations, and to establish clear lines of communication across organizational boundaries.

Third, there is a reported need to review the practical, local management of the MIRG service. Although municipalities receive funding to keep MIRG units operational, the people involved experience time and resource conflicts, potentially leading to deficits in MIRG preparedness.

Fourth, participants saw a need to increase exchanges and training for collaboration between MIRG units, other stakeholders, and across national borders. From the ship operator point of view, both MIRG units and ship crews could benefit from more extensive on board training and familiarization. In addition, conducting joint training on board a variety of merchant ships could expand MIRG's understanding of hazards specific to certain ship types.

Fifth, a ship operator comment that may be relevant for the development of MIRG strategy and tactics was that ships vary with respect to both technical and organizational firefighting capabilities, something that may require MIRG units to adapt their approach. This kind of adaptability may, however, place new demands on ship familiarization and access to up-to-date information on the individual ship in distress.

When continuing to develop MIRG, one prospect may be to compare the Swedish MIRG organization and operational experiences to those of neighboring European nations, especially seeing that some foreign MIRG units are deployed more frequently. Doing so could also favor MIRG harmonization within Europe, something that was requested by ship operator workshop participants.

6 Conclusions

MIRG currently operates in an environment marked by rapid technological innovation and international political unease. It is the conclusion of this study that the volatility of that operational context has not fully been factored into the management and organization of MIRG. Our results suggest that the need already expressed in the previous MSB investigation (2010) - to clearly establish goals and expected capabilities of MIRG - should be revisited. In the long term, there is an apparent need to review the regulatory framework and governance of MIRG, to match an established level of ambition with the appropriate resources.

Based on the results of this project, the following areas are in need of further activity:

- Assessing risk in MIRG operations. Comparing Swedish MIRG capabilities to relevant accident scenarios, taking current political and technological developments into account, to inform the future organization and dimensioning of MIRG
- Benchmarking the formal organization, regulation and mandatorship for the Swedish MIRG against those of other European countries
- Conducting a MIRG training needs analysis to make sure that training is grounded in operational needs and realistic accident conditions – this should also address education and training methods that can accommodate less resource intensive skill development

- Investigating ways of supporting MIRG mission leadership and coordination functions in MIRG missions
- Increasing collaboration and exchanges between sea rescue organizations, discussing equipment, manning, operational approaches and training needs
- Creating opportunities for mutual learning between MIRG and crews from a variety of ship types and operations
- Increasing knowledge about MIRG within the Swedish shipping cluster.

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