The International Maritime Rescue Federation Mass Rescue Operations Project:

The use of surface units

Overview

The IMRF’s mass rescue operations (MRO) guidance is provided in 30 separate chapters at www.international-maritime-rescue.org. For downloadable documents referenced in this chapter please use the drop-down menus or return to the MRO project main page under ‘Resources’. For a general introduction please see chapter 1, ‘Complex incident planning – the challenge: acknowledging the problem, and mass rescue incident types’.

This chapter discusses:

- the ‘surface units’ that may be available
- the types of work they may be assigned to
- the use of surface units in
  - search
  - rescue
  - support
  - and coordination roles
- the use of ‘non-professional’ units such as leisure craft
- releasing units when they are not, or are no longer, required

1 Discussion of the use of surface units

1.1 Specific issues relating to the coordination of surface units involved in an MRO are covered in chapters 19 (on SAR mission coordination) and 20 (on-scene coordination). Issues relating to the retrieval of people in distress are discussed in chapter 8; accounting for everyone involved in chapter 9; and the transfer of survivors to places of safety in chapters 10 & 11. Providing on-board support as well as, or instead of, rescue is discussed in chapter 15. The use of aircraft is discussed in chapter 23, and the efficient communications necessary to overall success are considered in chapter 25.

1.2 All of these are aspects of, or relate to, the use of surface units in an MRO, and the reader is referred to the relevant chapters listed above – and to the guidance in IAMSAR Manual. Volume III, which is carried by ships trading internationally, is the main reference document for these ‘additional SAR facilities’. Particular guidance may be found in Volume III Sections 6, 14 & 16.
What surface units?

2.1 For the sake of brevity we have used various collective phrases in this guidance, including ‘surface units’ as distinct from ‘aircraft’. But what are we thinking of here? ‘Surface units’ which may become involved in maritime MROs include:

- designated maritime SAR units as defined in IAMSAR: see below
- designated land SAR units in circumstances in which they can assist – a grounding or stranding, for example, or the arrival of people in survival or other small craft
- merchant ships on international voyages 1, of all types: container ships, tankers & other bulk carriers, other cargo ships, cruise ships & ferries, offshore support vessels, etc
- merchant ships on domestic voyages, again of all types although these will generally be smaller and perhaps less prepared for SAR
- Government vessels: customs, border guard etc and military vessels
- Ships’ rescue and other boats
- Port and other local authority vessels
- Tugs / vessels capable of towing
- Specialist support vessels with, for example, firefighting / boundary cooling capability
- Fishing vessels
- Leisure craft.

2.2 IAMSAR defines a ‘SAR Unit’ or ‘SRU’ as “a unit composed of trained personnel and provided with equipment suitable for the expeditious conduct of search and rescue operations”. IAMSAR distinguishes such units from ‘SAR facilities’: “any mobile resource, including designated search and rescue units, used to conduct search and rescue operations”. The real difference between a ‘SAR unit’ and any other ‘facility’, as defined, lies in the amount of training and specific equipment available. The crew of a SAR unit should be more capable in an MRO than those of a SAR facility which is not a SAR unit – but all SAR facilities can be of use, and in an MRO none should be discounted too quickly.

2.3 Various types of surface units will be available in various places and at various times. Smaller craft, for example, will tend to remain inshore, and will be more numerous by day. Port authority vessels will be near their home ports. Ferries operate on fixed routes, to a timetable. Most designated SAR units are shore-based and have particular areas of operation; land units are obviously restricted, and so on.

2.4 Referring to the definition of a mass rescue operation, we know that – by definition – we will not have enough designated SAR units to do all the work required in an MRO. Depending on the circumstances – remoteness, and to some extent weather and sea conditions – we may have few such units, or none at all. In all cases in which an MRO is required we will need the assistance of other SAR facilities.

2.5 As discussed in chapter 13, the additional facilities likely to be available should be included at the planning stage, and the SAR Mission Coordinator (see chapter 19) should consider all the facilities available at the time of the incident. It is possible that some will not be of use in the conditions prevailing at the time –

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1 Most ships on international voyages are subject to the provisions of the Safety of Life at Sea (SOLAS) Convention, while ships on solely domestic voyages may not be. In a SAR context this is important because SOLAS requires specific planning, training and equipment aboard ships on international voyages – the requirement to plan for the recovery of people from the water, for example. Ships not subject to the relevant regulations may not be so well prepared.
but no type of ‘surface unit’ that might be useful should be discounted simply because of what it is. Units may appear at first sight to be ‘too big’, ‘too small’, ‘too unmanoeuvrable’ etc: but is that really the case?

2.6 IAMSAR Volume II Chapter 1.3 provides guidance on the identification of SAR resources.

3 Broad areas of work

3.1 As discussed in chapter 19, there are three broad areas of work in a mass rescue operation: search, rescue and/or support. The first two functions are very likely to overlap each other, and may coincide with on-board support operations aimed at facilitating evacuation; or on-board support may be provided in the hope of avoiding the need for evacuation and ‘traditional’ SAR. The SMC should plan for each of these eventualities, at least until on-board support is no longer practicable.

3.2 The SMC will also need to appoint an On Scene Coordinator (see chapter 20) and, as discussed in chapters 17, 19 & 21, may also need an Aircraft Coordinator and a small number of ‘sub-coordinators’.

3.3 The various types of SAR facility available should be considered in the light of these various requirements. What units are required for search, rescue and support? Of the units available, which are best suited to each function? If one or more of these functions is not presently required, which units should be held in reserve in case the situation changes? Which unit commanders should be appointed to the various coordination roles, and can their units carry on other SAR or support functions at the same time? Finally, which units can or should be released?

3.4 We will consider each of these questions in turn, mostly focussing on function rather than the specific vessel types listed above.

4 Search

4.1 Chapter 9 discusses the need to account for everyone at risk in an MRO. As discussed in chapter 13, the SAR facilities best suited for search activity – usually designated SAR units – are, in many cases, also likely to be the best suited for rescue work: a resource we are short of in an MRO. Many of these units would also be the first choice for the various on-scene coordination functions required. It can be argued that the most efficient plan will be to use facilities which will find rescue difficult or impossible, and which will not be fully occupied in coordination roles, as search units.

4.2 We have also noted that, in some circumstances, search activity may be a very significant part of an MRO, covering a wide area: when a fleet of small craft has to be found, for example. But in others the search may be purely precautionary and/or much more focussed, such as in the controlled evacuation of a single casualty unit like a passenger ship or offshore installation.

4.3 The SMC must consider the requirements against the resource available at the time. It is not the case that certain types of SAR facility will always be best for searching. It depends on the circumstances.

4.4 Small, manoeuvrable units will be preferred for most small-area, focussed searches – but a big, less manoeuvrable ship can still play a search role here, stationed down-drift from the immediate scene of operations (in the ‘goalkeeper’ role).

4.5 Conversely, large ships unsuitable for tight search areas or for rescue work in the prevailing conditions can be well used in a large search area – perhaps on single legs passing through the area, if sufficient
ships are available (see below) – leaving more capable SAR units to conduct rescue work. If resources permit, a small rescue unit – perhaps the ship’s own rescue boat, if it can be launched in the prevailing conditions – can be assigned to each search unit, to investigate sightings and to retrieve people found, while the larger unit continues its search pattern without deviating from its track.

4.6 Land SAR units can assist in MROs occurring near or on the shore, when searches of the shoreline should be conducted. The use of aircraft for searching is covered in chapter 23.

5 Rescue

5.1 We must remember that ‘rescue’ essentially means three things: retrieving people in distress; attending to their immediate needs; and transferring them to a ‘place of safety’. It is not simply a matter of ‘picking people up’. Different types of SAR facility will be more or less capable of each of the three parts of rescue.

5.2 Obviously, SAR units trained and equipped for retrieval will be more capable of it than big ships and other such facilities where training and equipment is limited. Low freeboard areas, manoeuvrability, lifting devices and experienced crew are all very useful in at-sea rescue, and designated rescue units should have them all. But there will be insufficient such units available in an MRO.

5.3 Other vessels on scene should therefore also be assigned to retrieval. Smaller craft such as fishing vessels, pilot boats, patrol boats, customs launches and suitable leisure craft might be used (although see below as regards the last category). If there are no such craft on scene, or not enough of them, ships and other large units may be able to deploy their own rescue craft. If this too is insufficient, or impracticable, ships will have to attempt retrieval direct. See chapter 8 and the IMO guidance referred to in that chapter.

5.4 Ships can facilitate retrieval by circling the operating area to calm the sea within it to some extent. This technique is mentioned in the IMO’s guidance and in IAMSAR Volume III Section 4, and it can be very effective – but it does require sea-room and, especially in an MRO, careful coordination and good communication between the units participating.

5.5 It is one of the OSC’s functions (see chapter 20) to advise the SMC on best use of the facilities on scene. Usually the OSC can see what is happening direct while the SMC cannot, and usually (in cases in which surface units are involved) the OSC will be a professional mariner, able to appraise the conditions and the consequent capabilities of the units on scene. The OSC can, for example, see if small craft are having difficulty, and – in discussion with their commanders – can determine which of the larger vessels on scene are best suited to the retrieval task.

5.6 Not all maritime rescue happens at sea. An MRO on the shoreline may also involve land SAR units, who will be best placed to rescue people heading for the nearest beach in survival craft etc.

5.7 Once people are retrieved, the rescue moves to its next phase – the transfer to a ‘place of safety’, providing for survivors’ initial needs while on passage: see chapters 10 & 11. Here the situation becomes more complicated, for a small unit well-suited to picking people up may not have the facilities or personnel to care for them on board for long (and thus does not really qualify as even a temporary place of safety). It may be best to transfer people recovered by a small rescue unit into a larger one, for their own well-being and to enable the first rescue unit to go back for more. But this too may be complex: transfer between the two units is not risk-free, and may be too difficult to be attempted.

5.8 Again, it is for the OSC to discuss the options with the commanders of the units concerned and to advise the SMC as to the best way forward. Difficult decisions may have to be made. The risks of transfer from
a small unit to a large one may have to be accepted, for example, if other people are still waiting to be retrieved.

5.9 The reader is again referred to the discussion in chapter 10 of what constitutes a ‘temporary place of safety’. A large ship does not automatically qualify, despite being a large and safe platform, for she may have only a small crew and limited accommodation, food, water and medical capability. Survivors may have to be kept on open decks – which raises new safety concerns. On vessels carrying flammable cargoes, for example, survivors must not be allowed to smoke. Security may also be an issue in some circumstances.

5.10 Where there is a choice of units able to take survivors aboard, the OSC and the ships’ masters should agree priorities and distribution if time permits, keeping the SMC informed.

5.11 When the ratio of crew to the number of survivors is low and/or when the transfer to the place of safety ashore will take some time, there is a risk of crew fatigue, with consequential risks to safety. The crew have to run their ship as well as tend to, or monitor, the survivors. The SMC may be able to arrange additional support – medical and welfare support in particular, but also personnel to help control the situation aboard – for rescue units that require it. As noted in chapter 10, the SMC should not assume, just because survivors are aboard a rescue unit, that that unit’s crew will be able to look after them unaided. Rescue is a holistic process, and the SMC is responsible for coordinating the whole of it. The commanders of rescue units are also responsible for asking for help if they need it.

5.12 The selection of the place of safety to which the survivors are transferred should primarily depend on what is best overall for those survivors. However, the choice of vessel to effect the transfer may have a bearing on the matter. Large ships, for example, may be unable to enter small harbours nearby. A transfer at sea into smaller craft may not be the best option; and the SOLAS and SAR Conventions stipulate that ships undertaking rescue work should be inconvenienced as little as possible when it comes to landing those rescued (see below), which can also be a factor. At the other end of the scale, small rescue units may need to seek shelter in nearby harbours when it might be preferable from an overall point of view if they landed their survivors at other, more distant but better resourced places.

5.13 In many cases it will be a matter of securing survivors as best possible first and deciding where to take them second. Nevertheless, the decision is one for the SMC, in consultation with the rescue units and the relevant authorities ashore. See chapter 24.

6 Support

6.1 As discussed in chapter 15, one response in a mass rescue operation is to seek to provide assistance to, or aboard, the casualty. This will either remove the need for the casualty to be evacuated at sea, or will facilitate that process. Suitable surface units may be able to provide that support.

6.2 Tugs, or other vessels capable of towing, may be able to secure the casualty – ‘salvage as SAR’; a holistic response discussed in chapter 15. Similarly, other specialist support vessels may be able to provide external support: vessels with firefighting systems, for example. Some vessels – salvage vessels and military vessels in particular – may be able to send trained teams aboard to assist the casualty’s crew with firefighting or other damage control. The transfer of staff to assist with external communications, or as an on-board coordinator as described in chapter 17, or to provide medical and/or welfare assistance, may also be a possibility.
6.3 Again as described in chapter 15 and its reference documents, support may also be provided to people aboard survival craft etc, pending retrieval, or even instead of it if survivors can remain aboard the craft as they are brought to a place of safety.

6.4 The SMC should be able to arrange additional support to people remaining aboard the casualty, or in survival craft, in the same way as described for people aboard rescue units.

7 On-scene coordination

7.1 For the reasons discussed in chapter 20, a surface unit with sufficient SAR-capable personnel and communications equipment will usually be a good choice for the key role of On Scene Coordinator – and a designated SAR unit not needed for immediate rescue work (or with enough capacity to be able to undertake it at the same time as acting as OSC) will usually be chosen. A surface unit is usually preferable to an aircraft in this role because of greater on-scene endurance and, probably, a better understanding of the capabilities and limitations of the other surface units involved.

7.2 It may be, however, that designated SAR units on scene will be better used in other roles, while a large ship, for example, less able to engage in the necessary search, rescue or support work directly, can focus on on-scene coordination. The choice of OSC is discussed in chapter 20.

7.3 Other, ‘sub-coordinator’ roles are also considered in chapter 20, and in chapter 17. While an on-board coordinator may be deployed from a surface unit, the commanders of such units are more likely to be asked to coordinate searches or to marshal small craft, if these roles are required.

7.4 How best to coordinate the activities of all the surface units involved, and to interlink them with the aircraft responding, should be a matter for discussion by the SMC, OSC and ACO as appropriate. Tasks should be allocated to the most suitable units – an assessment which is easier to conduct if there is some time lapse before units arrive on scene. But what must be avoided is a ‘free-for-all’. Units rushing in, uncoordinated but anxious to help, can be a danger to themselves, other responders and the survivors – and will usually be less effective overall.

7.5 The guidance on multi-unit searching contained in the IAMSAR Manual (Volumes II & III) should be consulted for large search operations. IAMSAR contains less guidance on coordinating rescue, or rescue with an element of precautionary search and/or support work in the vicinity. This is understandable, as there are so many variables in the rescue and support contexts. However, some basic guidance can still be offered.

7.6 One useful coordination process is to establish a ‘cordon’, to avoid having units enter areas in which they are more likely to get in the way than to be of help. The cordon will usually be a circle centred on the casualty. Ships not required for the operation at all (if there are any such) should be asked to keep well clear of the cordon, where responding units should be gathered either to await a tasking that will take them inside it, or to receive survivors ferried out to them by more manoeuvrable units.

7.7 In the latter case a plan of the operation would resemble a spoked wheel, with receiving vessels waiting around the rim, a safe distance from the casualty and from each other, while rescue units move up and down the spokes, retrieving people and transferring them to the receiving vessels. It may be that one or two rescue units can be assigned to each receiving vessel, enabling a rapport to be developed which will ease the transfer operation. This structure is simply illustrated below.
In this example, four ships, shown in blue, are acting as receiving platforms. Ships ‘A’ & ‘C’ each have one surface rescue unit (in green) assigned to them; ship ‘B’ has two; and ship ‘D’ has two helicopters, one picking people up from the casualty (in red), the other delivering them to the receiving ship. The helicopters’ movements will be coordinated by an ACO, and the surface rescue units by the OSC so that, ideally, neither the casualty nor the receiving ships are dealing with more units at a time than they can readily manage.

The ships stay safely on the cordon, and the approach and departure tracks to and from the casualty are so arranged that the rescue units do not interfere with each other. Other units arriving will be asked by the OSC or ACO as appropriate to stay outside the cordon until they can be built into the plan, perhaps adding a fifth ‘spoke’, or replacing one of the original units; or undertaking other on-scene tasks such as searching. (Search units are not shown in the simplified diagram above.)

7.8 The situation illustrated in the figure is only an example, of course. Circumstances such as the proximity of navigational hazards may prohibit a full ‘wheel’ being formed; and the proximity of harbours may enable the shuttle transfers to be direct to land. There will be variations in every case – but the basic principles of orderly approach to the scene and transfer of survivors away from it to places of safety, temporary or otherwise, are the key points here, as is the concept of, preferably, assigning particular rescue units to particular receiving platforms. The plan must be flexible – but there should be a plan!

8 Use of ‘non-professional’ facilities

8.1 In chapter 13 we discussed the possibility of ‘non-professional’ units – chiefly leisure craft – responding to an MRO within their range or occurring in their vicinity. Although some of these craft may be highly manoeuvrable and their crews very capable, the chief concerns are that it may be difficult to establish communications with them or to assess their capability. But they must still be considered, as they may respond anyway, and may be of use.

8.2 Chapters 17 & 20 discuss the coordination of such craft. They should be marshalled, probably by a ‘sub-coordinator’ who will establish communications with them and report back to the OSC. Like other units, it is recommended that capable units in this category be held at a cordon until they can be assigned specific tasks. Others, deemed less capable, can be released and asked to keep clear.
9  Releasing units

9.1 Throughout this discussion we have tended to take the view that, as a mass rescue operation is one in which, by definition, there are insufficient SAR facilities to hand, every facility available should be considered a potential response resource. While standing by this principle, we must also acknowledge that an MRO is not simply a matter of alerting everyone, sending them to the scene, and keeping them there until the operation is over! Apart from being inefficient, such a response risks creating more difficulties – using up SAR facilities' on-scene endurance, for example, before there is work for them to do, or creating hazards through sheer over-crowding and confusion. The MRO planner before the event, and the SMC during it, should consider all the resources available, but should deploy them wisely and with specific tasks in mind.

9.2 In some situations this will still mean moving units to, or near to, the scene and asking them to stand by there, in case they are needed. This is most obviously the case when the casualty commander is hoping to contain the incident so that a full SAR response is not needed. The SMC, however, should still be planning for a situation in which the attempts at containment fail, so that a full-scale, ‘traditional’ MRO is needed. S/he needs resources nearby, ready for such an outcome.

9.3 But even in an MRO there may be units which should be released from the response and asked to keep clear. We have mentioned ‘non-professional’ craft above: some may be very useful, but others, or too many of them, may be more trouble than they are worth, getting in the way of more capable units or trying to operate beyond their own safety margins. Safety concerns may also be a deciding factor for ‘professional’ units; particularly small ones in difficult weather or sea conditions.

9.4 Other units may be genuinely unusable in the circumstances – large vessels that cannot approach the scene because of insufficient depth of water, for example. It must also be remembered that the SOLAS Convention does not oblige a ship’s master to assist whatever the circumstances. Regulation V/33, which applies to most vessels at sea, requires 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. This obligation to provide assistance applies regardless of the nationality or status of such persons or the circumstances in which they are found. If the ship receiving the distress alert is unable or, in the special circumstances of the case, considers it unreasonable or unnecessary to proceed to their assistance, the master must enter in the logbook the reason for failing to proceed to the assistance of the persons in distress, taking into account the recommendation of the [IMO] to inform the appropriate search and rescue service accordingly.”

9.5 Where possible, the SMC should seek to minimise the inconvenience to responding vessels. SOLAS regulation V/33 goes on to say that:

“Contracting Governments [of States which have ratified the Convention] shall coordinate and cooperate to ensure that masters of ships providing assistance by embarking persons in distress at sea are released from their obligations with minimum further deviation from the ships’ intended voyage, provided that releasing the master of the ship from the obligations under the current regulation does not further endanger the safety of life at sea. The Contracting Government responsible for the search and rescue region in which such assistance is rendered shall exercise primary responsibility for ensuring such coordination and cooperation occurs, so that survivors assisted are disembarked from the assisting ship and delivered to a place of safety, taking into account the particular circumstances of the case and guidelines developed by the [IMO]. In these
cases, the relevant Contracting Governments shall arrange for such disembarkation to be effected as soon as reasonably practicable.”

Chapter 3.1.9 of the 1979 SAR Convention, as amended, contains essentially the same text.

9.6 Apart from liaising with ships’ masters as to their intentions, capabilities and concerns and ensuring that any ships recovering survivors are able to land them quickly, the SMC can assist by using units in such a way as to minimise the inconvenience to them while still maximising their usefulness in an MRO. It may seem odd to refer to an MRO as an “inconvenience”, but there is simply no point in retaining units on scene if they have no useful purpose or if they can be relieved and released.

9.7 As regards searching we have briefly considered using passing ships (if there are enough of them) to conduct just one leg of a search pattern each. This is easier for the search units, although it adds some extra planning and communications to the search coordinator’s load. It is also a good method to adopt in a busy traffic separation zone or other restricted area, when traditional search patterns may become hazardous as ships attempt to turn against the traffic flow.

9.8 As regards rescue action, and particularly ships asked to stand by in case they are needed, the work can be shared. Ships tasked early can be relieved by others as they arrive on scene later, meaning that the delay to each individual vessel is limited. The SMC, working with the OSC and the commanders of the units on scene, should assess which and how many ships to retain, including ones with particular capabilities. Ships and other units which are, in effect, superfluous to requirement should be released.

10 Keep it simple!

10.1 Avoid over-complex planning: there is a risk of creating a structure that is too complicated to implement ‘on the day’, or which does not fit the specific requirements of the MRO you are actually faced with.

10.2 An MRO plan needs to be flexible in order to be useful operationally. The more fluid the planning, the better it will be able to cope with different, and developing, scenarios. Discuss ideas – the ‘spoked wheel’ above, for example – with the other responders at the planning stage and be ready to implement the right ones, adapted as necessary, when the time comes.

10.3 Be ready, too, to adapt or change your plan as the MRO develops. Watch how your SAR facilities function, usually through reports from the OSC and/or ACO. If a plan is not working as you would wish, either explain it better or change it. Do not try to enforce a failing plan.²

11 Summary

- There are many types of ‘surface unit’ (including land SAR units) that may become involved in an MRO. All should be considered at the planning stage, and by the SMC and other coordinators when the plan is being put into action.

² We quoted Dwight D Eisenhower earlier, on leadership (chapter 2). He also said: “Plans are worthless, but planning is everything [...] When you are planning for an emergency you must start with this one thing: the very definition of ‘emergency’ is that it is unexpected, therefore it is not going to happen the way you are planning.”

Discussing likely problems and solutions beforehand is of great importance; but an unbending plan will hinder the response. A plan without flexibility can actually be worse than worthless...
○ Planners and coordinators should consider which units are most (or least) suited to the various functions that may be required: search, rescue, support and coordination.

○ An MRO will always require a search of some kind; possibly an extensive one. The SMC, with advice from the OSC, should consider assigning to the search facilities which cannot be better used in other roles, particularly rescue. As always, the search plan should take full account of the capabilities of the units asked to carry it out.

○ ‘Rescue’ means retrieving people in distress, attending to their immediate needs, and transferring them to a ‘place of safety’. Ideally, the most suitable units should be used at the retrieval and transfer stages – and they may not be the same for both. But compromise may be necessary.

○ Rescue needs to be as carefully coordinated as search action. Rescue units’ approach to the scene and transfer of survivors away from it to places of safety should be organised and controlled. Assigning particular rescue units to particular receiving platforms is beneficial.

○ Ships and other rescue units should not be assumed to be satisfactory temporary places of safety. Their actual capabilities should be determined, and any necessary support provided to them.

○ Support may be an alternative, or an aid, to ‘traditional’ rescue; but surface units will still be required to stand by.

○ Some units may be unsuitable for the MRO, by their nature or because of the prevailing conditions. They, and other units which are, or become, superfluous to requirement should be released.

○ The IAMSAR Manual should be consulted, and other chapters of this IMRF guidance considered, as regards different parts of the operation; search, rescue, support, coordination and communications.

○ The planning should always be flexible, and the ongoing operation should be monitored carefully to ensure that the plan being implemented is working for the units on scene.

12 Further reading

12.1 The reader is referred to the other chapters mentioned in the ‘Discussion of the use of surface units’ above and, in turn, to the further reading they recommend.

12.2 In general, the IAMSAR Manual provides the main international guidance on the use of SAR facilities; Volume II as regards their choice and coordination, and Volume III as regards their operation.