INSARAG | 30 YEARS

Preparedness Response

# INSARAG GUIDELINES | 2020

## Volume II: Preparedness and Response

### Manual A: Capacity Building

OCHA United Nations Office for the Coordination of Humanitarian Affairs

# Contents

## Abbreviations

| | |
|---|---|
| BoO | Base of Operations |
| EMS | Emergency Medical Services |
| EOC | Emergency Operations Centre |
| ERG | Emergency Response Guide |
| ICS | Incident Command System |
| IEC | INSARAG External Classification |
| IER | INSARAG External Reclassification |
| Hazmat | Hazardous materials |
| INSARAG | The International Search and Rescue Advisory Group |
| IRNAP | INSARAG-Recognised National Accreditation Process |
| LEMA | Local Emergency Management Authority |
| NAP | National Accreditation Process |
| NDMA | National Disaster Management Authority |
| NGOs | Non-governmental organisations |
| OCHA | United Nations Office for the Coordination of Humanitarian Affairs |
| OSOCC | On-Site Operations Coordination Centre |
| PPE | Personal Protective Equipment |
| RDC | Reception/Departure Centre |
| SOGs | Standard Operating Guides |
| SOPs | Standard operating procedures |
| TRG | Technical Recognition Group |
| TSG | Technical Support Group |
| UCC | USAR Coordination Cell |
| UN | United Nations |
| UNDAC | United Nations Disaster Assessment and Coordination team |
| UNISDR | United Nations International Strategy for Disaster Reduction |
| USAR | Urban Search and Rescue |
| VOSOCC | Virtual On-Site Operations Coordination Centre |

# 1 Introduction

United Nations (UN) General Assembly Resolution 57/150 (16 December 2002) identifies that each country has the responsibility first and foremost to take care of the victims of disasters and other emergencies occurring on its territory. It has the primary role in the initiation, organisation, coordination and implementation of humanitarian assistance within its territory. Therefore, it is essential that countries develop a robust emergency management framework based on a national assessment of risk.

Capacity building in this manual defines the process of identifying and supporting existing urban search and rescue (USAR) resources or developing new capacity through the creation of systems and processes, recruitment of suitable staff, the procurement of equipment, training of personnel and its integration into the existing legal framework for emergency management sufficient to support and sustain the capacity.

The principles of USAR capacity building that support the objectives of UN General Assembly Resolution 57/150 and the INSARAG Abu Dhabi Declaration of 2015, include:

- To fully support and promote the development of national USAR capacities and building and urges all Member States to ensure ownership of the process to strengthen national capacity.
- Recognising the work undertaken by INSARAG to develop innovations in and recommendations for operational and organisational guidelines for the capacity-building of national USAR Teams, and encourages Member States to support such efforts, fully recognising that international response is a complement to national capacity.
- An emphasis that capacity building should cover all five components of USAR capacity (search, rescue, medical, management and logistics) and can range from community-based first responders to the development of a Heavy USAR capacity.

Governments are urged to build national USAR response systems and mechanisms into its national legal framework and emergency management planning process. The Local Emergency Management Authority (LEMA) (or National Disaster Management Authority (NDMA), as the government's lead disaster response agency, should be well versed in the need for and deployment of national resources (including USAR) to disasters of any sort within its sovereign boundary.

Commonly included within the legal framework of each country, there is the utilisation of a national command and control centre, often referred to as an Emergency Operations Centre (EOC) within the LEMA structure. An EOC serves around the clock as the central command and control facility responsible for carrying out the principles of emergency preparedness and functions at a strategic level in an emergency situation and ensuring the continuity of operation in an affected country.

An EOC is responsible for the strategic overview, or "big picture", of the disaster, and does not normally directly control field assets, instead making operational decisions and leaving tactical decisions to lower commands. The common functions of all EOCs is to collect, gather and analyse data; make decisions that protect life and property, maintain continuity of the country, within the scope of applicable laws; and disseminate those decisions to all concerned agencies and individuals. In most EOCs there is one individual in charge of the facility, the LEMA Emergency Manager.

Additionally, from a perspective of developing new USAR capacity, the INSARAG Response Framework provides a basis for the sequence of this development process, that is:

- To develop a robust national emergency management framework based on an assessment of risk.

- To develop the management and administration infrastructure and consider the alternative response options. The alternative response options are:
    - Develop community-based first responder networks.
    - Develop elements of these networks into a specialised level.
    - If required, develop USAR capacity from those resources.
    - Undertake an assessment of their response capacity.
    - Review lessons learned from the assessment and continue to maintain and develop capacity.

For those engaged in search and rescue, either at national or international levels, there is a need to undertake a continuous process of capacity building. This capacity building manual was developed to assist those that have just started developing resources, those who have already established resources, as well as those that support each resource.

This manual will attempt to differentiate between the usual actions taken by organised first responders and how they can expand their capacity to develop technical rescue capacity (Chapter 2: Building Local Capacity). Chapter 3: Building National Capacity will focus on the formation of USAR capabilities that can be designated as national capabilities.

A complicating factor in this work is the term “USAR” which is often misunderstood or improperly applied. In the last decades USAR has often been used to describe any type of rescue operation, be it a road traffic accident, hiker lost in the wilderness, water related events, as well as a climber stuck on a rock ledge. This manual defines response resources as:

- Community-based spontaneous volunteer: Can be seen in any type of response, from the concerned citizen rendering aid at a road traffic accident, to one attempting to assist after a sudden-onset event.
- First responders: Recognised as an organised response typically provided by fire services, emergency medical services (EMS) personnel, civil defence units, police, and others.
- Specialised responders: Include local technical search and rescue teams and national USAR Teams.
- International assistance: Defined as international USAR Teams.

# 2 Building Local Capacity

Worldwide, fire services (volunteer and professional), civil defence, and militaries along with non-governmental organisations (NGOs) and charities have assumed a major role as primary responders to rescue incidents that involve, among other things, structural collapse, trench cave-ins, confined spaces, industrial and agricultural machinery water emergencies, and people trapped above or below grade-level. These emergencies are grouped into a category of rescue called technical rescue.

Technical rescue incidents are often complex, requiring specially trained personnel and special equipment to complete the mission. Natural forces such as earth tremors, precipitation, extreme temperatures and swift water currents often complicate technical rescue incidents. The presence of flammable vapours and toxic chemicals can also increase the level of risk.

The safety of teams conducting technical rescue operations is of a special concern. First responders throughout the world perform technical rescues on a daily basis. Some complex technical rescue incidents may last many hours or even days as rescue personnel carefully assess the situation, obtain and set up the appropriate rescue equipment, monitor scene safety, and remove hazards before they can finally reach, stabilise, and extricate the victims.

The presence of hazardous substances or elements such as flammable vapours or dust often forces rescuers to take additional precautions and time to ensure that operations are conducted safely. Experience has shown that hasty rescue operations can endanger the lives of both rescuers and victims. At the same time, rescuers know that a victim's survival chances are often dependent on quick extrication and transportation to a hospital. Some organisations are better prepared than others to perform technical rescue operations. To deal with complicated rescue operations, many organisations have created special technical rescue teams. A technical rescue team is a specialised group of personnel having advanced training and specialised equipment to safely and efficiently conduct complicated rescue operations.

Considering the mandate, the specialties and capabilities of individual teams vary greatly, depending on their level of training, number of trained personnel, and availability of specialised rescue tools and equipment. For example, some organisations have the training and equipment to perform rescues at collapsed structures by cutting through concrete and removing heavy debris, while other teams are limited to working with picks and shovels to remove debris.

Many organisations have single-discipline rescue teams such as a water rescue team. These teams are trained and equipped to handle one type of rescue. Others have multi-discipline teams that are prepared to perform more than one type of rescue operation.

The formation of a functional and safe technical rescue team, whether single- or multi-discipline, requires careful planning, a large time commitment from the team members, equipment research and acquisition, risk analysis, training, and sustained annual funding.

This manual provides guidance on how to form a technical rescue team, which often starts with the formation of the Community First Responder that serves as the foundation for other capacity development, including USAR. It discusses many of the considerations that must be made before forming a team such as:

- Do we need a team for our community?
- What type of team does our community need?
- How do we conduct a risk assessment to identify rescue hazards?

- How do we start a team?
- What training is necessary for team members?
- What dangers are involved in technical rescue?
- How can we fund the team?
- What type of personnel will we need on the team?
- What laws and standards pertain to rescue?
- What equipment will the team need?

The roadmap to illustrate the stages of developments and requirements from a single responder to a national level USAR capacity is attached as Annex A: Roadmap for USAR National Capacity.

## 2.1 First Responder

The formation of the Community First Responder is usually the first step taken by any community or organisation to equip and train itself to respond to an emergency. This formation comes in various shapes, sizes and capabilities and is determined largely by the types of risks or hazards that the community is facing. Most, if not all, are formed based on voluntary basis.

In the other hand, first responders can be officially recognised as an organised response typically provided by fire services, EMS personnel, civil defence units, police, and others.

## 2.2 Technical Rescue Capabilities

The First Responder (community or organisation) that is mandated to perform rescue operations will be more often presented with a unique or complex rescue situation requiring special skills and equipment to safely resolve. Some organisations are prepared to handle such events, but in many cases, the skills and equipment needed for these events exceed the capabilities of the responding organisation. From this, many organisations have formed or considered forming technical rescue teams to address these complex situations.

Most newly formed teams begin by training members in a single discipline, such as rope rescue or water rescue. Once this capacity is developed, it may expand into other areas of rescue so that it is a multi-discipline team which can handle several types of advanced rescue. An organisation may also choose to establish different teams with individual capabilities.

Various rescue disciplines exist. The rescue disciplines discussed in this manual include:

- **Confined space rescue:** A confined space is an enclosed area with limited entry or egress, which has an internal configuration not designed for human occupancy such that an entrant could become trapped or asphyxiated. It may have inwardly converging walls or a floor that slopes downward and tapers to a smaller cross section. These spaces include sewers, vats, caves, tanks, and other areas. Rescues from such spaces are dangerous, especially if the interior environment is toxic or oxygen deficient.
- **Water and ice rescue:** Rescues from lakes, swamps, flooded areas, swift or calm water bodies, and the ocean fit into this category. There are several different specialties within water rescue including swift water, calm water, underwater, surf, and ice rescue. Each of these requires specialist training.
- **Collapse rescue:** This involves building collapse or other structural collapse as seen in large urban areas affected by a sudden-onset event (earthquake). Many collapse rescue teams have been

established in earthquake prone areas. They may also be needed in cities that have many older buildings or new construction projects.

- **Trench/cave-in rescue:** Trench or cave-in rescue could occur in almost any jurisdiction. Trenches are often found in areas of new construction where pipes or cables are being buried. The most common trench rescue scenario involves rescuing a construction worker trapped when the trench walls collapse.
- **Rope rescue:** High-angle or low-angle rescues are likely to occur around cliffs, ravines, caves, mountainous areas, high-rise buildings, communications towers, water towers, or silos. These rescues may require complex rope and hauling systems to safely secure personnel and extricate victims.
- **Industrial and agricultural rescue:** Industrial machinery presents many challenges to rescuers. Many industrial rescues involve confined spaces or heavy extrication to free victims trapped by machinery. It could also involve individuals trapped under or inside agricultural machinery or silos.
- **Vehicle rescue:** Vehicle collisions (no matter which type) may result in the entrapment of one or more passengers. Extrication of these victims requires specialised knowledge, training and equipment.
- **Transportation rescue:** Crashes, collisions or derailments that may result in entrapment of passengers. Extrication of these victims requires specialised knowledge, training and equipment.

## 2.3 Considerations Before Forming a Team

This chapter describes the types of factors that must be evaluated when considering whether to form a technical rescue team. For the purposes of this manual, a team will refer to a group of persons who are trained and equipped to perform technical rescues in one or more specialised areas.

Many considerations must be made before starting a rescue team, including whether a team is really needed, whether local officials will financially support a team, whether responders are committed to forming a team, what are the risks associated with a rescue team, and what laws affect the formation of a team.

The following questions should be considered by the proper authorities before attempting to develop a technical rescue team.

### 2.3.1 Is a team needed in our community?

This question can be answered by conducting a risk analysis of the local community. The ultimate decision for choosing to develop technical rescue expertise should be based on the needs of the local community. The sponsoring organisation (such as the government or the donor) must honestly and accurately assess the risk level in the community and if the risk is real, the sponsoring organisation should make every effort to secure the necessary resources to perform a rescue safely and efficiently. If a need does exist, but this need is being satisfied by an outside response team that is available to respond into the jurisdiction, then developing a separate team may be unnecessary.

### 2.3.2 What type of team is needed for our community?

Another consideration centres on the type of team that would be needed. Should the team have a single function, or is expertise needed in multiple disciplines? Again, this question can best be answered after conducting a risk assessment.

### 2.3.3 Do we have commitment from the organisation membership for this?

Planners should thoroughly consider the ability of existing emergency response personnel to take on a new challenge. The level of commitment needed to start a technical rescue team is extremely high since it requires dedicated leadership and participation on the part of the entire membership. Many times, only the members who are undergoing the training are considered and forget to evaluate the impact of this training on their co-workers who assume additional responsibilities during technical rescue-related absences. From this perspective a total commitment and clear understanding of the impact of this responsibility must be shared throughout the organisation in pursuing a technical rescue responsibility.

### 2.3.4 How much will it cost to form a team, and is funding available and sustainable?

Planners must thoroughly evaluate both the start-up costs and the ongoing operational costs for this type of venture. Start-up costs may be very expensive but depend on the equipment the resource already possess, and the type of team emergency officials want to initiate. Most start-up costs go toward equipment purchases and training. Operational costs may include ongoing training, equipment maintenance, and salaries if paid employees are utilised.

Planners must consider whether the funding already exists for a new rescue team and how likely it is for the sponsoring organisation to obtain funding. Funding may come internally from the city or externally from donations by outside organisations.

### 2.3.5 Would elected officials and city management support a Technical Rescue Team?

The formation of any rescue team will require support and commitment from officials outside of the sponsoring organisation, and in some case requires endorsement by the government. They will have the ultimate say about funding a team. The basic expenses such as purchasing special equipment or funding training can only be met if there is full support from outside officials. Their support is also necessary if emergency managers try to share resources with other communities.

In many instances the decision by local authorities to develop an expertise in technical rescue is prompted by an incident of significant magnitude in which the local responders were found to be unprepared to handle the situation. Emergency managers may feel the need to develop technical rescue skills but, in the absence of a major incident, are unsure of how to justify this type of expenditure.

Consider the questions that will be asked by fiscal personnel or elected officials about these expenditures such as:

- Why do we need all this expensive equipment?
- How many incidents did we have last year?
- We have done just fine in the past, why do we need it now?

An emergency manager may be acutely aware of the current limitations of current capabilities and the potential criticism that may result if the response resource is not prepared when a major incident occurs. Emergency managers should recognise the risks that are involved if the sponsoring organisation commits emergency workers to a work environment that they are insufficiently trained or ill-equipped to handle. Consider whether the USAR Team can explain these risks to managers and elected officials and what their reactions will be. The sponsoring organisation should be prepared to provide documentary evidence to support the development of a dedicated USAR Team

### 2.3.6 Are other resources available from neighbouring communities?

As the planning of an assessment of current technical rescue needs, consider the option of sharing these resources among two or more communities. Utilising a shared or multi-agency response is fiscally responsible and can provide an appropriate level of service.

### 2.3.7 What challenges are posed by forming a team?

Conducting technical rescue, like firefighting, is dangerous. Certainly, risks can be limited by providing proper training about safe rescue techniques and by purchasing equipment designed to make rescues safer, but the sponsoring organisation must consider what dangers will confront rescuers and whether it and the rescuers are willing to face these dangers in a real incident.

Statistics indicate that a sizable number of deaths in confined spaces involve untrained and/or ill-equipped rescuers. Technical rescuers may face many risks including asphyxiation within a confined space, fall injuries from operating on ropes, and drowning while operating in swift water conditions.

One of the greatest mistakes made when forming a team is to think that the sponsoring organisation can create a team without basic training and basic equipment. Some organisations have attempted to start a team or perform dangerous rescues without having even basic equipment or training. This is extremely risky from the standpoint of both the rescuers and the victims.

### 2.3.8 What laws, regulations, and standards affect development of a team?

One of the most complicated and misunderstood areas affecting technical rescue is legal mandates and standards. A host of mandates and standards have been written which affect different types of rescues. Compliance with these regulations is required for all rescuers for safety purposes.

Before starting a team, the Team Leader must consider what laws regulating response will affect a team and the costs of compliance and non-compliance. Failure to comply with a regulation during a rescue can result in fines or other penalties.

Additionally, the Team Leader must ensure the resource will complement existing national disaster legal framework, and that the team is considered a part of national disaster planning.

### 2.3.9 What training requirements exist?

National training requirements must be considered when planning for a rescue team. Mandatory training requirements vary from country to country or even among localities. Most technical rescue training mandates are self-determined by a country or locality that may require the sponsoring organisation to follow a particular standard of training.

## 2.4 How to Form a Technical Rescue Team

The formation and development of a technical rescue team is a considerable undertaking. While the formation of all aspects of a team, both administrative and operational, is quite intensive, the maintenance and recurring training is even more challenging. It can be an expensive undertaking requiring new training and equipment, and most importantly, careful planning.

This chapter recommends steps to be taken in the formation of technical rescue team. The steps are organised into four phases of team development:

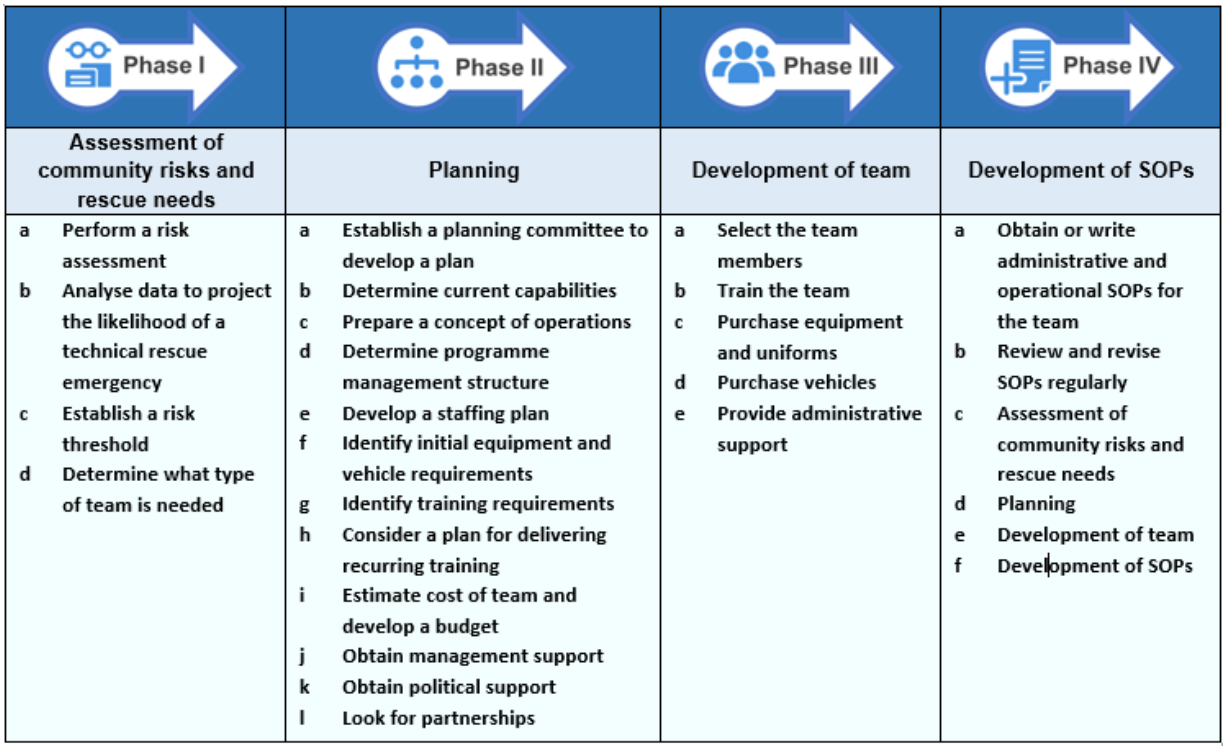



*Figure 1: The four phases of phases of team development.*

Given the complexity of forming a technical rescue team, each step must be carefully considered so that important issues are not missed.

### 2.4.1 Phase I: Assessment of Community Risks and Rescue Needs

**Risks and rescue needs**

In determining whether a team is needed in the community, the sponsoring organisation must first do some research to evaluate the risks in the area. A risk analysis will help them to determine what the level of risk is and what potential hazards exist so a decision can be made whether a team is needed. This is a particularly important part of starting a team for two reasons. First, political leaders will want to know what risks exist to justify funding a team.

Second, the sponsoring organisation will want to know what risks confront them, what type of hazardous scenarios to train for, and what rescue equipment will be needed to address the risks. A thorough risks analysis should define the sponsoring organisation's objective for a team and justify the effort of forming a team.

The sponsoring organisation can start this by first doing an analysis of potential worst-case scenarios to guide it toward development of a realistic Risk Assessment. Start with asking the basic questions:

- What is the largest natural and/or man-made hazard facing the community?
- What would the organisation do if the worst-case scenario happened today?
- How would the community to react if the organisation was not prepared to respond?
- How could the population and environment be affected if no local capacity exists?

**(a) Perform a Risk Assessment**

A risk assessment should be based on historical data on rescues allied to an analysis of newly introduced risks. Begin by assessing past rescue needs in the assigned response area. The sponsoring organisation may look to past incidents or planned new construction to determine the frequency of technical rescues in the area. Other potential sources of data include the national office of statistics, construction or contractors' associations, building officials and inspectors, and safety managers at local businesses.

Experience may indicate the likelihood of technical rescue-type incidents during major construction projects. The sponsoring organisation must also consider target hazards that exist in the assigned response area now or anticipated in the future. Target hazards are specific risk areas that confront the team in a rescue emergency.

A review of the natural features of a locality will reveal some hazards. Rivers, rapids, cliffs and rock-climbing sites are but a few of the areas where incidents may occur. A review of existing building plans may highlight certain types of commercial or industrial facilities that might require the services of a specialty team. Contact the local building authority to identify new or planned construction that may contain target hazards.

Make a list of target hazards which present special rescue challenges requiring special technical rescue equipment or advanced rescue training to safely and effectively control. Lastly, the sponsoring organisation should survey personnel about their knowledge of hazards.

Regardless of the size or economic make-up of the community almost every locality is subject to some type risk, such as a major transportation accident or construction collapse, that would necessitate technical rescue expertise. The prevalence or concentration of a specific industry in a community may guide emergency officials to prioritise and develop expertise in areas of technical rescue that have the greatest likelihood for generating an occurrence with that type of industry or activity.

**(b) Analyse Data to Project the Likelihood of a Technical Rescue Emergency**

To demonstrate the likelihood of a technical rescue incident, begin by showing the frequency, or rate of which incidents have occurred in a given period of time in the community or even in other jurisdictions.

Common risks and target hazards found in communities:

- **Underground tunnels/waterways/sewers:** Confined spaces, toxic gases, oxygen deficiency.
- **Rivers/flood ducts:** Swift water rescue, calm water rescue, toxic water environments.
- **Flood-prone areas:** Surface and underwater rescue, ice rescue.
- **Industrial facilities:** Hazardous materials (hazmat), toxic gas emissions, confined spaces, machinery entrapment.
- **Cliffs/gorges/ravines/mountains:** Above grade and below grade rescue.
- **Agricultural facilities:** Dust explosions, confined spaces, hazards materials, fertilisers, machinery entrapment.
- **Cesspools/tanks:** Toxic gases, oxygen deficiency, confined spaces.
- **New constructions:** Structural collapse, trench rescue, machinery entrapment.
- **Old buildings:** Structural collapse.
- **Wells/caves:** Confined spaces, hazardous environments.
- **High-rise buildings:** High angle rescue, elevator rescue.
- **Earthquakes/hurricanes/tornados:** Collapse rescue, extrication, disaster response, floods.

- **Solid waste transfer facilities:** Hazmat, toxic gas emissions, confined spaces, machinery entrapment.
- **Transportation networks:** Hazmat, toxic gas emissions, confined spaces, machinery entrapment, derailments.

**(c) Establish a Risk Threshold**

The final determination in a risk assessment should involve weighing the potential risk to the community and the potential risk to emergency responders who must perform the rescues. The presence of hazards in a community creates a risk that someone will become injured or need assistance from rescuers.

Likewise, if the community expects the team to provide rescue assistance, the lives of the rescuers performing a rescue will be put at risk. Risks vary in severity. The presence of one risk may be very mild, whereas the presence of another very severe. The severity of a hazard must be considered as part of a final risk determination.

In terms of a water rescue team, the risks created by a small pond are much less than those created by a swift water channel. Likewise, the probability of the occurrence of a rescue incident involving a swift water channel is usually greater than that involving a small pond. The community with the small pond may determine that the risk level created by the pond is too minor to warrant a special water rescue team, whereas the community with the swift water channel may determine otherwise.

If the rescuers are expected to perform rescues in hazardous environments, they will face risks including toxic environments and inhalation injuries (confined space rescue), drowning (water rescue), falls (rope rescue), secondary collapses and crush syndrome (collapse rescue), and explosions (silo rescue).

Each community will have to make its own determination about what an acceptable level of risk is, and what is the risk “threshold” that will necessitate the formation of a special rescue team. The community and local officials should know exactly what the rescue team’s rescue capabilities and limitations are, what risks confront the community, and the dangers that rescuers face in performing rescues. The community should not expect rescuers to perform certain rescues without proper training and equipment.

It is important to differentiate between trained rescuers and spontaneous responders at this point. Trained personnel know the limitations of their capacity while an untrained spontaneous responder will not. Responders of any type must always be cautious not to place themselves in a position where they can become the next victim. The sponsoring organisation however must consider that when there is no forethought or when rescue operations are clearly botched, there is likely to be public outcry.

The risk analysis should help the sponsoring organisation determine whether a team is necessary. If it demonstrates that a team is required, the next step is to determine what type of team is needed. What risks is the sponsoring organisation trying to address? Will the team handle only basic rescues, or will it be expected to perform complex rescues?

What types of emergencies will this team respond to? Define the extent of the capabilities the sponsoring organisation thinks are needed. These may include:

- High angle/rope rescue.
- Trench collapse.
- Structural collapse.
- Confined space.
- Agricultural rescue.

- Vehicle rescue.
- Mass transportation rescue.
- Industrial rescue.
- Machinery entrapment.
- Calm or swift water rescue.

Should a multi-disciplinary team be needed to cover several hazards, such as water and confined space rescue, the sponsoring organisation may want to begin by forming a team in only one of these disciplines, become proficient in it, and then expand to a second discipline.

It is recommended to first establish proficiency in the most important areas and expand later as the team builds on the initial capacity and after initial skills are developed in this area.

### 2.4.2 Phase II: Planning

**(a) Establish a Planning Committee to Develop a Plan**

Select a committee to develop the sponsoring organisation's plan and appoint a chair. The development committee should contain competent planners as well as individuals who might become the Team Leaders of the technical rescue team during its development and operation phases.

In forming the committee, the sponsoring organisation may want to place certain individuals that already have rescue experience or other related experience on the planning team.

First define the goals for a technical rescue team development committee. What is the committee's charter? What are the objectives and parameters? When do they need to complete their planning?

The committee should understand the goals and ensure that the goals are focused. A timeframe should be given for the team to complete a plan. At least one member of the rescue team's top management should be a part of the committee to help give it direction and to verify that it stays on course.

The plan should address resources and operations for the following areas:

- **Organisational structure:** What is the hierarchy of the team? How do the administrative and operational elements blend? What is the decision-making process?
- **Personnel and Staffing:** Who will be the Team Leader(s)? What types of skills will be necessary to join the team? What will be the size of the team?
- **Equipment:** What equipment will be needed? What equipment do the individuals provide, what does the team provide?
- **Vehicles:** What type(s) of vehicle(s) will best serve the assigned response area and rescue mission?
- **Training:** What initial training and recurring proficiency training will be needed?

The specialties covered with the team and the needs of the jurisdiction will help the sponsoring organisation to formulate a mission statement for the team. The mission statement is important because it will give direction and focus to a new team.

Once the sponsoring organisation has determined the type of team needed, it should develop a specific plan of action for creating the team. This plan should cover all aspects of team development including personnel, equipment, and training.

Organisation structure: Who will lead the organisation, will maintain records, equipment inventories, and provide programme oversight?

Political support: Will the sponsoring organisation need to obtain this, or does it already have support from local leaders?

**(b) Determine Current Capabilities**

Identify what equipment and training the sponsoring organisation already possesses. Some of the equipment needed is probably already on hand. Additionally, some of team members may have already taken rescue classes. The more capabilities the sponsoring organisation can identify it already has, the faster and cheaper it will be to start a team.

**(c) Prepare a Concept of Operations**

Develop a basic concept of operations and a set of operational procedures. The concept of operations will assist the sponsoring organisation in thinking through how it intends to operate and what resources it will need. It will also help the sponsoring organisation demonstrate to programme management and the public of the potential consequences the community could face if such a resource is not developed, while at the same time showing how the team will be used.

Outlines of the operational procedures are needed early in the process to demonstrate to management that the sponsoring organisation have thought through the programme and have not left anything out. The sponsoring organisation can fill in the detail procedures as it gets closer to putting the team into service.

**(d) Determine Programme Management Structure**

An organisation considering the formation of a technical rescue team should identify and task personnel to address the fundamental requirements of the programme. These personnel would comprise the programme management team. A senior person should be identified as the senior programme officer. This individual is the central administrator who coordinates all ongoing programme responsibilities (i.e. scheduling meetings, developing proposals and correspondence, assigning tasks, tracking accomplishments, etc.)

Most developing teams have found it necessary to name at least one rescue training officer. This position is responsible for the myriad issues involved in developing, conducting, and tracking training certification. Likewise, the assignment of an equipment officer is extremely important. These positions address issues related to equipment research and procurement, reception of new equipment, organisation of the equipment cache, and ensuring that a maintenance and exercise programme is addressed for all tools, supplies, and equipment on a recurring basis (weekly, monthly quarterly, etc.)

Due to the significant amount of development and staff work required when initiating a new programme, the assignment of a staff/scribe position is quite beneficial. Tracking information related to equipment and personnel details is made more manageable with the assistance of a computer for word processing, database, spreadsheet programmes etc.

**(e) Develop a Staffing Plan**

One of the most critical development steps to accomplish in the formation of a new technical rescue team is to determine how many people are needed for the team. In general, staffing requirements must address filling all identified command/management staff as well as addressing the minimum number of personnel to effectively and safely conduct tactical operations.

Staffing size will depend on the type of rescue team; a trench rescue team could need more personnel than a water rescue team. In general, all major technical rescue disciplines are staffing intensive, at least during the initial start-up phase of operation. Trench rescue and structural collapse operations may be the most intensive, easily requiring at least four or five specialists, overseen by command positions and assisted by non-certified personnel.

Advanced rope operations may require a sizeable cadre of personnel for raising operations. The majority of personnel operating raising or belay lines need not be certified personnel (but must be under direct control of certified personnel).

The staffing plan should also address the number of personnel required per rescue unit (vehicle). Many first response organisations staff heavy rescue squads or other specialised units to address specific tactical requirements. Other organisations may not be able to accomplish this due to size limitations or other restrictions.

The plan must also include redundancy for all operational positions; the INSARAG Guidelines require a redundancy ratio of 2:1 for these positions. As example, if the team requires 12 rescue personnel for despatch, the team must have 24 rescuers available. Redundancy accounts for member illness, injury or absence without putting the team out of service due to staffing.

**(f) Identify Initial Equipment and Vehicle Requirements**

An analysis of the equipment needs should be conducted separately for each discipline. Then the separate lists can be combined into a single equipment procurement list. Most response agencies may already possess much of the identified equipment. In this case, it may only be necessary to gather the equipment in a central location or develop a resource list denoting each item's location and a mechanism to gather it for response use.

This process may dramatically reduce the funds needed to procure all necessary equipment for the team's operations, however it will require time in an emergency to gather the equipment if it is not kept at a central location. Some organisations have sent members to training classes to learn what rescue tools are necessary for a new team. This is an excellent way to establish basic knowledge of equipment capabilities, which is important for identifying what is needed.

In most cases, if funds are limited, the purchase of equipment should be prioritised based on the greatest need for one or more of the identified team disciplines. Purchases that increase personnel safety should receive higher priority, while purchases that expand capabilities should be a secondary priority. In any case, safety and the need for a certain amount of redundancy in equipment must be stressed.

Obviously, if a key tool or piece of equipment malfunctions, or is unavailable due to maintenance, the ability of the team may be critically impaired. It may be easiest to request copies of equipment lists from other technical rescue teams and use one or more of these as a starting point for the equipment cache development.

Once the sponsoring organisation has determined what equipment is necessary for the team, it can consider which vehicles can carry the equipment and team members. The sponsoring organisation may be able to fit the equipment on an existing unit, or it may need to purchase a new vehicle. Some teams use a cargo trailer, convert an old unit, or request a vehicle be donated by a local business.

**(g) Identify Training Requirements**

The training to competently and safely address each individual capacity is intensive. The greater the number of specialties a technical rescue team assumes responsibility for, the more difficult is the task of bringing personnel up to the necessary training and skill levels.

In the planning stage, the sponsoring organisation must identify what training it will need, what training is available, and how it will be delivered. Training needs will be determined by the team's focus. These needs will also be determined by any local or state training requirements (this is particularly important in states regulated by their ministry for occupational safety and health). When will the training be delivered? Who will deliver the training, and how does the team develop its own cadre of trainers?

**(h) Consider a Plan for Delivering Recurring Training**

Maintenance of skills is critical to the competency of rescue team members. Develop a plan which establishes minimum continuing education standards for members. Some of the recurring training can be done on an individual basis, but the entire team should convene for a team training session several times a year.

Check with the national training authority to see if it has already established continuing education *requirements for rescue team members. The cost of recurring training must also be considered.*

**(i) Estimate Cost of Team and Develop a Budget**

Preparing cost estimation for the team is time consuming and requires research, but it is a very important step in the development of a team. Local officials will require a detailed budget plan before approving a team.

The first step in planning a budget is to list separately the major types of rescue the sponsoring organisation plan to undertake (i.e. water rescue, confined space rescue, trench rescue, etc.). Consider each of these as an individual heading. Under each area, list the training, equipment, and apparatus that will be needed to start the team.

It is important at this phase to also include costs associated with the design and development of appropriate training areas. These areas must accommodate training required for the skill sets that are being developed. A central training area is acceptable, but consideration must also be given to having access to identified target hazards in the community (industrial plants, cliffs, tunnels etc.) to ensure realistic training is accomplished.

List all the equipment and training the sponsoring organisation would like to have – do not leave anything out. Costs for each of the following areas must be considered:

- Personnel hours.
- Training and continuing education.
- Texts and materials.
- Consumables (ropes, saw blades, batteries, nails, First Aid equipment).
- Communications equipment.
- Personal Protective Equipment (PPE) (hearing, respiratory and eye protection).
- Confined space atmospheric/environmental monitoring equipment.
- Audio-visual equipment.
- Training areas.

- Training props (concrete slabs, timber etc.)
- Classrooms.
- Insurance.
- Travel expenses.
- Medical requirements including vaccinations, medical examinations, post mission recovery etc.
- Tools and specialised rescue equipment.
- Vehicles.
- Protective Clothing (helmet, gloves, boots, clothing etc.)

Next, follow national regulations and procedures for the purchase of equipment. This will require heavy research. Do not just rely on costs in a catalogue. Thorough research on pricing involves talking with manufacturers or distributors to find out product capabilities and limitations so that the sponsoring organisation can compare different products. The sponsoring organisation also may be able to discuss special pricing. Prices should be rounded-up in the budget so that it is not under-budgeted.

Once the sponsoring organisation has completed pricing and product research, compare the different products and prices to determine what is best for the current situation. Total the cost of each training, equipment, and apparatus item to determine the maximum start-up cost. Those items not immediately essential to initiating a team may be tabled and budgeted in the future. This too will help lower the initial start-up costs.

The sponsoring organisation must determine what items are essential to begin a team. The total of the cost of the essential items is the minimum start-up cost.

**(j) Obtain Management Support**

This is probably the most important step in developing a technical rescue team. The sponsoring organisation must market the added benefit the programme will bring to the community, local businesses and government officials. All players will need to recognise the benefits of this kind of programme and support it.

Is the programme technically feasible? Get all necessary supporting materials ready and rehearse before going public with the plan. The sponsoring organisation may only get one chance to show the value of the programme and can assume that some of the audience will not be favourable or supportive. Be ready for this. Cite other organisations in neighbouring regions or countries that have teams and summarise how their teams are beneficial.

The sponsoring organisation objective in this step is to get permission to develop the Technical Rescue Team. Obtain support of the sponsoring organisation first, and then present the team concept to the local elected officials. Usually management will want time to think over the idea. Try to set a realistic timeline for the approval decision.

If the sponsoring organisation operates independently of any outside jurisdictional oversight, it can minimise this step. However, if it does not know how its membership feels about a rescue team, don’t assume they will buy into it without significant convincing.

**(k) Obtain Political Support**

Develop a plan to obtain political support. This is necessary to secure sustained annual funding for this programme. The sponsoring organisation will need political support to get funding if it does not have an

independent funding source. Remember that eventually the sponsoring organisation will have to go to these elected officials to procure funds for the project.

Be prepared to answer questions about the team. Common questions asked by management and elected officials include:

- Why do we need a technical rescue team – don't we already have those capabilities?
- How much will this endeavour cost – do we really need a team for rescues that happen so infrequently?
- How often will this team be used – can't we get rescue services from other jurisdictions?
- Can we share the costs of a team with another jurisdiction?

If the sponsoring organisation has gone through each of the previous steps, it will be prepared to answer questions like these. Be ready to make specific, concise points to justify the request for approval of a new team. Below is a list of tips that may help the sponsoring organisation win political support:

- Be sure to have support from the sponsoring organisation before going to the elected officials.
- Discuss the concept of a team with relevant elected officials.
- Prepare a list of hazards in the response area and note the dangers and risks associated with each. Give this to the elected officials.
- Create a video or slide presentation that will demonstrate the hazards that exist in the area. Be sure to note the risks presented by each to both citizens and rescuers.
- Discuss what will be the acceptable risk thresholds.
- The sponsoring organisation may gather action pictures of rescue teams already formed to demonstrate team capabilities.
- Have charts prepared that demonstrate the need for a team and show the number of rescue incidents the sponsoring organisation has ran in the past and expect to run in the future.
- Have charts prepared that outline a plan for developing the team.
- Be prepared to discuss regulations, such as those for confined spaces, which may require the sponsoring organisation to train personnel to a certain rescue level to make certain rescues. This alone may justify the team.
- Become familiar with other rescue programmes around the region or country that will serve as examples.

**(l) Look for Partnerships**

Partnerships are especially helpful to gain political support and secure funding. Local industry may have confined spaces and, under national regulations, may be required to have a confined space rescue team. The local industry, however, may not have the personnel necessary to have a team, and may request assistance from the sponsoring organisation to serve as their confined space rescue team.

The INSARAG Regional Group would be a suitable platform for UN Member States and USAR Teams to share and explore possible support from the regional network, including regional donors.

### 2.4.3 Phase III: Development of Team

**(a) Selection of the Team Members**

Selection of the required team members must be based on the overall teams' needs and requirements. The team must comprise the core members that can be deployed immediately for the task. Additional members could be recruited on volunteer basis and their services will only be rendered upon availability. Key

considerations such as the acquired skills, knowledge, expertise and competency need to be considered in the selection of the member. One of the best and uniform methods for selecting team members is to conduct interviews.

Start by soliciting personnel who are interested in joining the team. Have them complete a short questionnaire about why they want to join the team and what skills they could bring to the team.

Any person who has outside skills in areas such as construction, rappelling, EMS, etc. will bring added skills at no extra cost to the organisation. It is imperative that the sponsoring organisation clearly delineates the additional demands and responsibilities that will be expected of those joining the team before they officially join.

For instance, they may be expected to participate in continuing rescue training in addition to maintaining their primary profession. In a volunteer organisation, it is especially important to delineate expectations in advance because technical rescue team demands will probably take much more time.

Another consideration when selecting a team is to recruit members who have emergency medical training. Many rescues will require personnel to perform technical rescue team and emergency medical skills.

**(b) Train the Team**

The team will need a thorough initial training programme on all the equipment and the rescue techniques. Train the people to handle the specific target hazards in the response area (please refer to Annex B).

It is critical to ensure that the training programme includes a mix of hands-on and technical classroom topics. INSARAG methodology suggests a foundational approach be taken to any training programme to ensure a stair-step method is followed. This lessens the potential that the basic principles of search and rescue training are not overlooked or given lesser status.

Realistic training scenarios will require working with area contractors or other organisations to donate trenches, buildings, or other facilities, even after training grounds/props have been developed by the sponsoring organisation.

**(c) Purchase Equipment and Uniforms**

Purchase the equipment the team will need based on its mission objectives and based on equipment needs previously defined. Start with the basic equipment and add the more complex technical rescue equipment as progress is made.

**(d) Purchase Vehicles**

During the planning phase, the sponsoring organisation specified the general type of vehicle it would need (trailer, four-wheel drive, etc.). In this step, detailed vehicle plans are necessary, including equipment storage, to ensure that equipment will fit in the vehicle. The sponsoring organisation should allow about a one-third growth factor for future equipment additions. Make sure there is a secure storage area for everything to avoid damage or injury. If a trailer vehicle is planned, verify that the trailer hitch is sufficient to handle the weight of the trailer and equipment.

This may require warehouse-type storage as well as what is mounted safely on the vehicle(s). Also, consideration of whether local climate variations (and security) will result in the need for garage parking of the vehicle(s).

**(e) Provide Administrative Support**

One part of the planning process of technical rescue team development that is usually overlooked is the administrative effort necessary to get the team started. Members of the team or support staff should be assigned to maintain the records for the team.

Example record-keeping tasks include:

- Team roster.
- Health records (to include inoculations).
- Deployment models.
- Deployment records.
- Standard Operating Guides
- SOPs.
- Regular work schedules of members (to determine how to schedule activities).
- Equipment inventories.
- Equipment repair/maintenance.
- Records (personnel and equipment).
- Team activation checklists.
- Training records.
- Training.
- Expenses.

The importance of identifying and developing a continuous training and re-training programme is addressing the tracking equipment and accounting of team member attendance at training. This is an important administrative step.

Additionally, the sponsoring organisation must track all expenses related to training and equipment. This information will help it conform to the approved budget, develop year-out budgets and will be necessary for reporting to administrators and elected officials.

**(f) INSARAG First Responder Training Programme**

To assist in the development of local community response, INSARAG has developed the INSARAG First Responder Training Programme. The flexible programme can be used by the national/local authority as a foundation for first responder capacity building in disaster prone countries. The programme, which can be adapted to suit local conditions, consists of:

- INSARAG First Responder Course.
- INSARAG First Responder Training of Trainers Course.
- Supporting material for the participants.

This course is designed for the local responders from the emergency services and members of local community organisations that will become involved in the emergency management of sudden-onset disasters. The INSARAG First Responder Course provides the participants with an overview of an organised approach to disaster response, with education provided primarily in the fields of rapid assessment, surface rescue, and initial medical care.

The key learning objectives to be attained for this course are as follows:

- Create an awareness of the generic hazards and risks within a structural collapse environment.
- Enable participants to conduct a survey of the impacted area.
- Enable participants to perform simple search and rescue techniques and render basic life-saving measures.
- Link community-based response to organised local emergency services.
- Provide an understanding of regional, national and international USAR support systems.
- Enable participants to organise volunteer rescuers on-site.

Details of the abovementioned programme are available at www.insarag.org and from the INSARAG Secretariat.

### 2.4.4 Phase IV: Development of SOPs

*(a) Obtain or write administrative and operational SOPs for the team*

SOPs are an integral part of a technical rescue team and should complement the approved Concept of Operations. Some organisations choose to function without SOPs, but these are vital to have a safe and organised rescue operation. SOPs establish technical rescue team organisation, processes, and techniques before an emergency incident occurs.

SOPs should answer questions such as who is in charge, what equipment will be used, what techniques will be used, who is qualified to perform a technique, what is expected of each responding unit, and what staffing is required at a rescue incident. Most importantly, they provide a structure by which a technical rescue team can respond safely in an organised fashion to the chaos and uncertainty presented at almost any emergency incident.

Development of technical response SOPs can often prove challenging. If the sponsoring organisation requires assistance, it should contact the INSARAG Secretariat who can provide an introduction to resources that have these SOPs on hand.

Technical rescue teams should consider forming two types of SOPs: administrative and operational. The procedures should be consolidated into one manual, and they should be fully integrated with the sponsoring organisation's existing SOP system.

- Administrative SOPs provide the framework for the personnel structure of the team.
- Operational SOPs describe things such as techniques and unit responsibilities that are used at an emergency incident.

**Administrative SOPs**

The administrative section should address:

- **Chain of command:** The administrative and operational sides of the chain of command for the technical rescue team should be clearly defied.
- **Specialty certification requirements:** The tactical capabilities that the team is responsible for must be clearly identified. The training requirements related to each discipline must be fully defined. This should include the initial training required for certification in each discipline, as well as continuing education requirements.

- **Unit/equipment requirements:** This section would define the types of vehicles and equipment for the technical rescue team. Any requirements related to the management, organisation, and maintenance of the team equipment cache must be addressed. This should include the development of a routine cache maintenance/exercise schedule to ensure the operational readiness of all tools, equipment, and supplies.
- **Unit staffing:** The staffing of specialty vehicles, if dedicated, should be identified. This would include any minimum staffing requirements, if mandated. Or, it may only be necessary to mandate the number of specialty personnel required to effectively handle technical rescue operations (the number may vary by incident type). In any case, the number of certified personnel and/or minimum staffing requirements should be clearly understood by all.

**Operational SOPs**

The operations section should address:

General operating procedures: This would cover the types of incidents the team is responsible for, the dispatch of standard/specialty units for any type incident, and general or first responder actions (i.e. standards for non-specialty personnel) to be taken upon arrival.

- **Incident-specific operating procedures:** A general overview of the tactical operating procedures should be defined. These may be separated by event type (i.e. trench, structural collapse, rope, etc.), if necessary. Unique requirements or considerations for each discipline should be addressed.
- **Regulations/requirements:** Certain technical rescue operations are impacted by local, state, or national regulations. These regulations should be included in the procedures.
- **Scene management procedures:** Most organisations already have an incident command system in place. The basic command structure can be used at any incident, including a technical rescue incident, but additional technical rescue command positions should be added to it. This section of the SOPs must detail how technical rescue incidents will be commanded. A command organisational structure designed for technical incidents should be prepared.
- **Tactical command worksheets:** Most technical rescue teams have developed some type of tactical checklist or command worksheets to assist technical rescue command personnel in the management of an incident. These may be developed for each discipline, if necessary.
- **Team activation:** Activation procedures must be developed and exercised by the full team to ensure their completeness and adequacy. These procedures should cover team callout, staging areas, equipment movement to the staging area, food procurement if required, list of personnel deployed and family contacts, daily status reporting to the sponsoring organisation if the team is deployed away from home, and other related lists.

*(b) Review and Revise SOPs Regularly*

SOPs should be reviewed on regular basis (at least annually) to ensure that the procedures are up-to-date and meet the needs of the team. In addition, after a major rescue incident, the procedures should be reviewed and revised if they proved to be faulty or gaps identified.

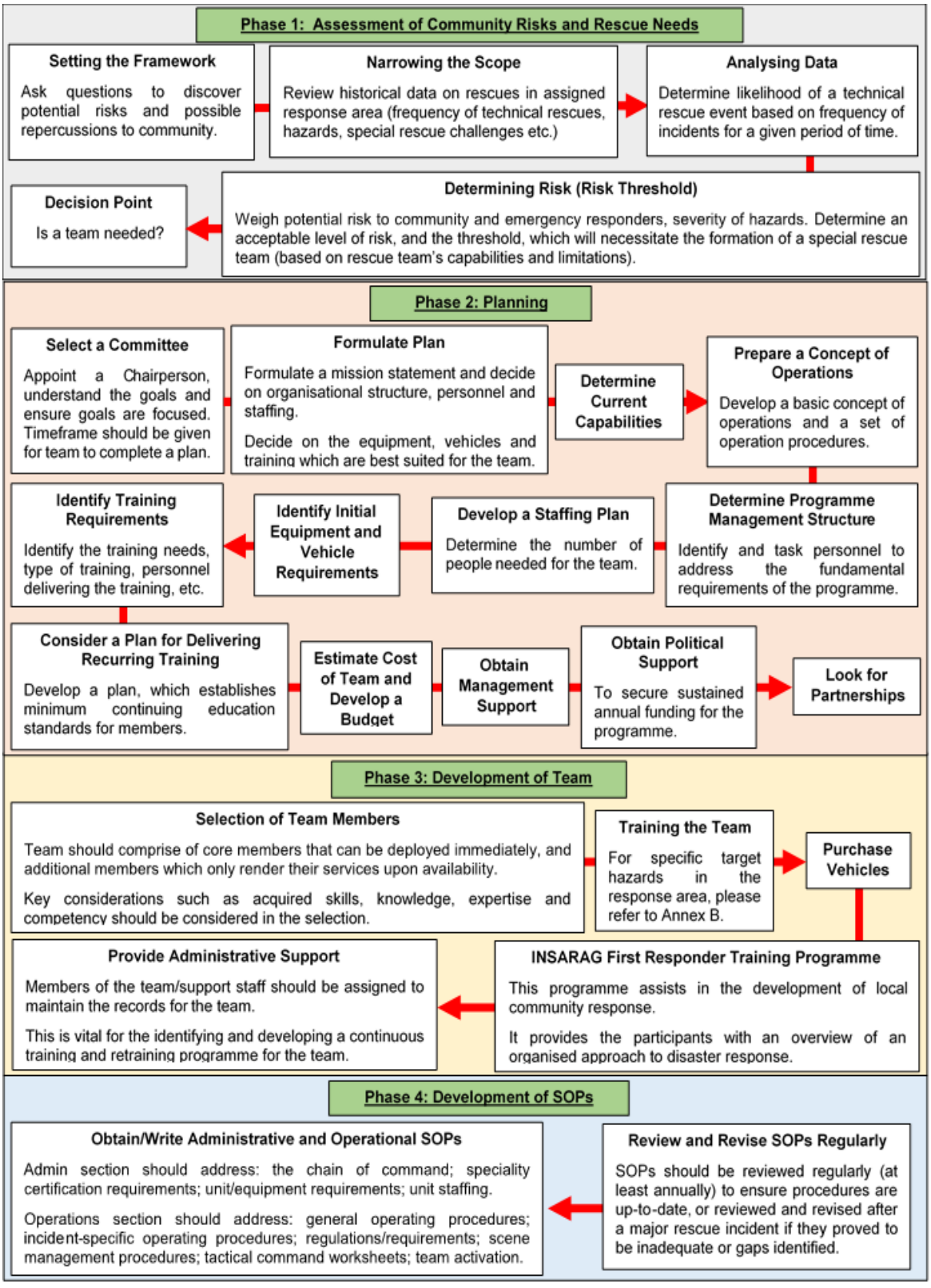



*Figure 2: How to Form a Technical Rescue Team*

## 2.5 Funding Requirements and Potential Sources

Technical rescue operations can be an expensive undertaking for many jurisdictions. Given financial constraints, locating funding sources can be one of the most difficult hurdles to overcome for new rescue teams. Existing teams often fight for their budgets each fiscal year and are always looking for new and creative ways to finance their operations.

This chapter discusses where the money goes when forming a team, sources of funding, and ideas for justifying a team's expenses.

### 2.5.1 The Financial Costs: Where the Money Goes

To help establish the type of rescue service needed in the community and the financial support the community is willing to give, it will be important to understand where the money need to be spent and how much is needed. To prepare for budgeting, care should be taken to account for the large number of consumables (timber, blades, medical supplies and so on), as well as operating expenses (equipment rental) and personnel costs (travel, compensation, insurance as example) required to delivery training.

a. **Initial training:** Training costs can range per student per course. Shortcuts should not be taken with training funds. Thorough training is necessary to have a safe and effective rescue capacity. The sponsoring organisation may consider training team members over a two- or three-year period to spread out the costs. Budget for personnel to receive basic awareness level training the first year and operations training the second year. A few select members could later be trained to the technician level or higher. Efforts should be made to have incident commanders participate in training, so they have an understanding of the rescue operations and equipment. This will also help when commanders develop SOPs for their rescue teams. It is also vital to develop an internal core of trainers to lessen the cost of a programme.

b. **Continuing education:** Funding for technical rescue teams must consider a commitment to continually train and retrain personnel. It is not enough to initially train and equip a team; to be effective members must constantly practice their skills and learn new ones. For example, it has been estimated that proficiency at technical rope rescue skills is reduced within six months after completing a rope rescue course if training is not maintained. Continuing education for technical rescue may be even more important because rescue incidents are usually rare, unlike other emergency events. Continuing education expenses are incurred from sending personnel to refresher courses or advanced courses that count toward recertification, or from holding a special continuing education drill.

   Holding a drill is generally the cheapest alternative but, in most cases, it will not provide certification for attendees. Legal mandates may require regular recertification training, which can be a more expensive proposition requiring the sponsoring organisation to hire an instructor that can recertify personnel. Forty-eight hours of continuing education per year is not an unreasonable requirement.

c. **Equipment:** Equipment costs will depend on the type of rescue capacity the community requires. Basic equipment to perform many rescues such as rope, ladders, and breathing apparatus may already be available within organisation. In many cases, supplemental equipment to augment the rescue capabilities could be purchased. Advanced capabilities, however, generally require expensive specialised equipment. Costs for equipment storage and maintenance must be considered also. Large caches of equipment must be kept secured but accessible in an emergency.

d. **Transport vehicles:** The major vehicle expenses a rescue team will encounter are for purchasing or retrofitting, maintenance, and fuel. The amount of money spent on vehicles to transport a team and its equipment will also vary widely.

   Vehicles range in type from pickup trucks and sport utilities to box vans and heavy squads. Many teams pull gear in trailers. Opportunity exists for having vehicles donated. Many utility companies donate vans or trucks to non-profit entities; the sponsoring organisation may be eligible.

   Private companies have donated beverage trucks or tractor trailer boxes to teams. Using these local resources can reduce the budgeting amounts. Annual maintenance costs must also be accounted for, especially if an additional unit is added to a fleet of apparatus.

e. **Insurance:** The cost of insurance is often overlooked. The sponsoring organisation may need to purchase insurance for equipment, vehicles, personnel, or malpractice. An organisation may be able to absorb insurance costs into its existing policy. In this case, the sponsoring organisation must verify that existing policies will extend coverage for these new operations.

   An organisation may need to add or make changes to its insurance policy to make sure its members are covered for confined space rescue or water rescues – duties which may not be listed in the organisation's charter, by-laws, mission statement, or articles of incorporation. Local officials and lawyers should be involved in this process. Insurance issues for consolidated teams, mutual aid coverage, and out of jurisdiction training also must be addressed.

f. **Justifying expenses:** Local officials will want the sponsoring organisation to justify the expenses necessary to start and fund a rescue team. A team may be easier to justify in a community with a large risk potential; smaller or less frequent risks make justifying funding more difficult. The expenses must be justified to the many individuals who control the financing; attempts should be made to involve all of them in the programme development for the team.

   A Team Leader must justify the funding to the organisation, who then must justify it to the elected officials. Today, public budgets are placed under a microscope – a clearly defined mission for a team is as important to its financial success as to its operational success. Linking funding requests to existing local needs – especially past incidents and safety concerns, provides more legitimate justification of the funding requests. Local, state or national regulations can also be used to justify a team's expenses.

   An analysis of a country's occupation health and safety regulations and other rescue standards should be conducted. The sponsoring organisation should research local/national safety rules and regulations to justify team expenses. All decision-makers should understand that, unlike most emergency operations, providers of technical rescue may be subject to severe fines and sanctions if they fail to comply with established occupational health and safety standards while performing their duties. Many would-be rescuers have died attempting to perform rescues they were not trained or equipped to handle. Making the public and government administrators aware of these issues may help justify the team.

### 2.5.2 Funding Sources

Finances for a technical rescue programme may come from many different sources. Often, municipal tax funds are allocated to add technical rescue services to existing emergency service providers. Donated money and equipment can also be used. Grants may be difficult to secure but may provide the necessary seed money to get a programme established.

Examples of funding sources include:

- Direct funding from local and national government.
- Cost sharing.
- Public-private partnerships.
- Local clubs and community charities.
- User fees and cost recovery.
- Permit fees.
- Donor countries/organisations.

## 2.6 Personnel and Staffing

The backbone of a good technical rescue team is well trained, experienced personnel. The personnel can be either career or volunteer or come from other backgrounds. The success of a team will be influenced in part by the personnel selected and their ability to function together as a team. This section discusses many of the personnel and staffing considerations necessary when forming a rescue team.

### 2.6.1 Type of Personnel Necessary for a Technical Rescue Team

In most response organisations certain personnel naturally gravitate towards technical rescue programmes. The capabilities required for personnel on a technical rescue team often involve a high degree of mechanical aptitude and physical strength. Individuals who are skilled working with their hands and who exhibit ingenuity, resourcefulness, and inventiveness are valuable.

Trade skills (i.e. carpentry, plumbing, electrical, metal work, electronics, heavy equipment operators, etc.) can be extremely useful and pertinent.

Individuals with special skills or training can bring their talents to a team at no additional cost to the organisation. Carpenters may have the knowledge about how to build shoring. Construction workers may be familiar with heavy equipment operations. Civil engineers must have knowledge about structural integrity during collapse operations. Recreational rappeler's or kayakers may have skills for rope or water rescue. These qualifications should be assessed during the recruitment process.

Rescue team personnel must also be willing to meet the minimum standards required to achieve and maintain special training certifications. The standards may require that each member attend a certain number of training sessions on a yearly basis. Certain sessions may be legally mandated requiring attendance by all personnel.

### 2.6.2 Personnel Physical/Mental Requirements and Health Status Monitoring

Due to the demanding physical aspects of technical rescue operations, the personnel comprising the team must meet the Member State fitness requirements. Team members must be capable of performing functions such as handling, transporting, and setting up heavy equipment. In addition, team members must have the physical and mental fitness and resilience to cope with living and operating in austere conditions for protracted periods.

It is recommended that sponsoring organisations develop a policy to evaluate the health status of individual USAR Team members, both prior to joining the team as well as on a cycle basis (as determined by USAR Team policy) going forward. The absence of such a policy may increase the risk during deployment of:

- Serious illness, injury or death of a USAR Team member in an austere environment.

- Adverse outcomes affecting the USAR Team's ability to function, potentially leading to costly early demobilisation.
- Emergency medical evacuation which disrupts USAR operations.
- Adverse impact on the already stretched local health infrastructure.

The USAR Medical Director should participate in the development of such a policy. In the context of INSARAG Medical Guidelines, the USAR Medical Director is the individual tasked with establishing policy and procedure, has the overall clinical primacy and is responsible for ensuring the medical component of a USAR Team is in a constant state of mission readiness.

The sponsoring agency should develop a vaccination policy for all USAR Team members in collaboration with the USAR Medical Director. Accurate records of all inoculations and boosters (as may be required) should be maintained for all USAR Team members. The World Health Organization (WHO) or national health authorities can provide guidance on vaccinations requirements.

### 2.6.3 Selection of Personnel for Team

Personnel application and selection are an important component in the organisation and development of a technical rescue team. The selection process should screen candidates for their commitment, consider previous rescue training and experience and skills learned, as well as leadership, and appropriate fitness.

Many teams begin the selection process by announcing the formation of the team and requesting letters of interest or curriculum vitae from interested individuals. Personnel comprising the team certainly need to be interested, motivated, and committed to the programme.

Organisations may want to conduct written and/or oral interviews of candidate participants to ensure the candidates understand the commitment they are making and as a means to select the best qualified individuals. It also may require special physical agility testing, especially if this is not done when members join.

As part of the selection process, an organisation may require members to make a commitment to be a team member for a certain period of time. Some have required personnel to sign an agreement to remain on the team for a set period, such as five years. This can be justified in terms of the time, effort, and funding involved in training and maintaining the skills of the personnel on the team.

This is a valuable commodity and investment. It is harder to require volunteer personnel to sign an agreement, although an NGO can create an agreement that requires a volunteer to repay the organisation for courses if the volunteer leaves within a certain period after completion of the courses.

### 2.6.4 Incorporating Firefighters, Emergency Medical Services Personnel and Non-Rescue Personnel into Rescue Operations

A dedicated technical rescue team must become an integral part of the overall community's emergency response operations. Specially trained rescue personnel will direct operations, but generally they will need the assistance of non-specialty personnel, who can perform tasks that do not require special training. This need implies that not only must the technical rescue team's operating procedures and team training address this aspect, but rescue training for all members should be addressed.

Some organisations have developed a first responder level of training for all personnel that is based on a tiered response system. This defines actions that should or should not be taken by non-specialty personnel initially arriving on the scene of a technical rescue incident. They usually arrive on the scene first, and they may be on the scene for a significant period of time prior to the arrival of the specialty team.

Effective scene management procedures should address this eventuality. All personnel must be trained in scene safety, information collection, and hazard identification. All personnel should clearly understand technical rescue hazards and especially what not to do at the inception of an incident. As example, personnel must understand that they absolutely should not enter an un-shored trench to begin rescue operations. Neither should personnel enter a confined space without proper respiratory protection, atmospheric monitoring, ventilation, lighting, and back-up team support.

The most effective way to address these requirements is through the development, training, and implementation of stringent scene management procedures. In general, these should address at least the following:

Actions to be taken or not to be taken by first arriving personnel include:

- Information collection/scene size-up.
- Scene controls (remove bystanders/erect cordons/etc.)
- Assessment/mitigation of hazards/utilities.
- Command structure.

These actions set the stage for successful technical rescue operations. It is vitally important that the EMS (medically trained ambulance personnel) staff are effectively coordinated into ongoing operations during technical rescue incidents. Their main functions are to treat patients and to standby in case a rescue team member needs medical assistance.

As soon as a technical rescue area or scene is secured, EMS personnel must be allowed access to the victim(s) for medical assessment and stabilisation. Some teams have trained paramedics to the technical rescue level so that they can enter hazardous areas and provide direct assistance to the patient.

Throughout the course of the operation, which can sometimes span many hours, EMS personnel must continually monitor and ensure the stability of the patient and must be allowed access.

### 2.6.5 Incorporating “Citizen Experts” Into Rescue Operations

Career and volunteer organisations may consider recruiting individuals within their communities who have special skills valuable to a technical rescue team. Many teams have located search dog handlers who participate in searches but are not required to be trained in management, EMS, or complicated rescue skills.

Some teams also include civil engineers, doctors, surgeons, and construction experts. The inclusion of experts in a team is not always a simple matter. These outside members may have less experience with field deployments or team construct and therefore may require additional training. Additional administrative tasks may be required such as the provision of injury or malpractice insurance.

The rescue agency may be concerned about the liability of using outsiders. It must consider whether it is willing to take on the liability for these experts during training, during travel to the incident, and at the incident.

One major consideration for the team to take note is when they are considering to be classified as an INSARAG USAR Team. The training, competency and deployment requirements of this expert must be fully understood and complied with. These requirements can be found in the Volume II, Manual C.

### 2.6.6 Minimum Number of Personnel Necessary for Each Rescue Discipline

The size of the cadre of personnel comprising the technical rescue team should be based on the type of team and rescue disciplines undertaken, the minimum number of personnel needed to accomplish a rescue mission safely, and the size of the command structure.

Each technical rescue discipline requires its own level of staffing of specially trained rescue personnel. Structural collapse operations, for example, may involve the initial deployment of one or more reconnaissance teams to assess a collapsed structure prior to rescue operations. In general, each reconnaissance team should be comprised of at least three personnel – two specialists working in tandem overseen by a supervisor assessing safety issues.

Trench rescue operations are physically demanding and require the movement and construction of heavy panels, timber, mechanical shoring and other specialised equipment. Fewer specialists may be required if a team has advanced, less labour-intensive equipment.

Advanced rope operations can be very complex. The more specialty personnel available to simultaneously set up the different parts of a rope system (i.e. raising systems, belay lines, anchoring systems, etc.), the quicker the incident response will be conducted.

**Note:** The desirable minimal staffing level for a confined space entry is two entry personnel backed up by two standby rescuers.

The level of staffing should also be predicated on the number of personnel required to staff command positions (in accordance with established incident management SOPs) as well as the number required to safely and effectively conduct the operation that is undertaken. Other than the normal complement of Incident Command positions (i.e. Incident Commander, Sector Officers, etc.), the technical rescue team should have its own subset of supervisory officers. This may be as simple as four individuals such as Technical Rescue Team Leader, Technical Rescue Safety Officer, Technical Rescue Equipment Officer, and Technical Rescue Personnel Officer.

The sponsoring organisation should also consider the number personnel that will be committed at an incident and how long they can operate before needing a rest break. If the incident were to last an extended period, planning should be done to ensure the sponsoring organisation have sufficient staffing levels for normal day to day operations in addition to the staffing needs of a special incident.

Once on scene, the Incident Commander can call for the appropriate number of specialists. It is important that the sponsoring organisation specify in the team's operating procedures the minimal number of specially trained and support personnel needed to respond on technical rescue calls or to perform specific functions.

**Note:** Safety at technical rescue incidents is both paramount and the responsibility of every individual; therefore, if the team does not have sufficient trained, equipped and qualified personnel to safely execute operations; it should wait until more personnel arrive.

## 2.7 Regulations and Standards Governing Technical Rescue Operations

Care must be taken that ensures the sponsoring organisation understands and abides by existing regulations and standards that pertain to work place safety. This applies to any various national laws and regulations that may apply to the rescue response area, including those of neighbouring jurisdictions and countries. The most significant regulations are those issued by national occupational safety and health agencies, which require employers to comply with mandatory minimum workplace health and safety

protections. These regulations are based on laws that establish the responsibility of an employer to provide a place of employment that is free from recognised hazards. Ignorance of the law is not an acceptable defence.

A “specialty team” such as a technical rescue team would be expected to have a higher level of skill and expertise than other individuals, even other members of the same organisation. Accordingly, technical rescue teams should pay close attention to applicable standards.

## 2.8 Technical Rescue Training

No tools or technology can compensate for lack of training and experience. Proper training is necessary for any rescue team to safely and effectively conduct rescue operations. This chapter discusses the evolution of technical rescue training, the future of rescue training, training requirements, how to plan training for the USAR Team, and curriculum for different training levels.

### 2.8.1 Sources of Training

There are many sources of rescue training available. There are private companies that will provide training in particular rescue disciplines. Many government agencies also offer rescue training, particularly for personnel from other organisations.

Most of these types of courses will certify that the student has completed the course and has achieved a minimum level of competency. However, the competency levels taught by individual trainers often vary due to the lack of standardisation in rescue training.

### 2.8.2 Developing a Technical Rescue Training Plan

It is important to develop training plans from the initial stages of team development. In many cases, members of organisations take training courses on their own and then develop a team on their own out of shared interest and competence in the subject. In other cases, members have no formal training whatsoever and are trained after the team concept is officially formed by their organisation. Several factors will affect the type of training programme necessary. These factors are discussed below.

#### The Area of Operations

A general knowledge of technical rescue can be imparted through training, but one of the most important factors in developing a training programme that meets the locality’s need is the nature of the area of operations. Training should be directed toward the geography and target hazards in the team’s area of operations.

Technical rescue training techniques can then be adapted to train personnel for responses to these hazards. Training should incorporate a thorough and systematic overview of the potential technical rescue hazards in the team’s response area. The team should develop contingency plans for the target hazards and train on rescue scenarios that could occur. Training is not complete without a thorough knowledge of how to handle rescues involving the hazards in the team’s response area.

#### Type of Team

It will be important to decide whether a multi-discipline or a single discipline team will be necessary. Depending on the type of team, how many personnel will be trained to the awareness/operations level; how many to the technician level; how many to the trainer level?

### 2.8.3 Specific Technical Rescue Training Examples

To give organisations an idea of the various technical rescue training curricula that could be established, sample outlines of some types of technical rescue course curricula can be found in Annex B. These sample outlines are intended only to present some of the topics that could be covered and are not necessarily complete outlines.

### 2.8.4 Recertification and Continuing Education

Recertification for technical rescue personnel is necessary to refresh practical skills and knowledge about the subject matter. In all types of technical rescue, skills must be honed and practiced to maintain a high readiness level.

New technologies and new techniques are constantly being developed to make technical rescue operations easier and safer. It is important to allow for continued training beyond basic training. Teams will learn to work better together, and an exchange of ideas and information will allow knowledge to be spread among experienced rescuers. An annual, skill-based test in competency, with the ability to retrain in deficient areas, may be the best way to keep an individual's skills and a team's level of competence consistent.

### 2.8.5 Documentation

Documentation should be kept for individuals, the team, and equipment, for both training and actual incidents.

**Individual records**

Teams should keep records of all training, including initial training and certification, and continuing education training for all personnel. Documentation should include training hours, skills demonstrated, skills performed, and skills tested. Evaluations by instructors and supervisors should be included.

**Team records**

Documentation should also be kept for the team as a whole, including types of training, hours, equipment used, and costs incurred. Use of new equipment and techniques, along with their limitations and advantages, should also be recorded. Personnel should be tracked for their level of training, readiness, and injuries.

**Equipment**

A log of major equipment, including life safety equipment such as PPE or rescue rope, should be kept to track use, repairs, problems, and replacement. This will help maintain a record should questions arise about a piece of equipment's use or safety.

**Incident records**

It is vital to conduct a thorough review of each technical rescue incident and to document it. This will allow teams to understand what occurred and to develop strategies to improve the safety, efficiency, and effectiveness of their training and preparation for future incidents.

Record keeping serves two main functions. First, it allows a team to establish a baseline for their readiness capacity and capability, so that they may use performance-based criteria to improve their operations. It also allows them to chart their progress and discover during periodic review the areas that need improvement.

Secondly, record keeping provides much needed documentation should legal issues arise from team operations.

### 2.8.6 Teamwork

One of the most important aspects of training in technical rescue is to teach rescuers to function as a team. Difficulties can arise when individuals do what they think is best, often working alone, inefficiently, and dangerously. Problems can also arise if rescuers from different companies or different organisations are forced to work together without having previously trained together. These problems can be overcome by conducting team training.

To perform technical rescues safely and effectively coordinated efforts on the part of everyone are necessary. Personnel must know their individual role and their job within the team. SOPs or guidelines should clearly illustrate the roles and responsibilities for each position on the team, up to the Incident Commander's responsibilities.

**Note:** The team members must constantly retrain to further develop their teamwork skills to function as an efficient and effective unit.

### 2.8.7 USAR Capacity Building Assessment Mission and Endorsement

Countries who wish to seek assistance in building USAR capacities can do so through the INSARAG's broad network of established USAR Teams, and such requests can be made bilaterally or through a request made to the INSARAG Secretariat, that will then channel such request to interested donor countries for consideration.

To support countries and organisations in the process of national USAR capacity building, and when such request is received, the INSARAG Secretariat will facilitate an INSARAG USAR Capacity Building Assessment Mission at a mutually agreed date, with the host country and global USAR experts, normally funded by donors or in-kind, or supported by the host country. The Secretariat also has a USAR Capacity Assessment Methodology Guide available on www.insarag.org to assist countries wishing to pursue this endeavour.

The primary objective of the mission is to provide objective feedback on the status of the host country's national USAR capacities and offer constructive recommendations in line with the INSARAG Guidelines. The assessment is based on the five components of a USAR Team as required by the INSARAG Guidelines. The mission may include a series of interviews with key stakeholders and some visits to several relevant sites as well as observing a skills demonstration in compiling its findings. Please contact the INSARAG Secretariat on insarag@un.org for more details on the USAR Capacity Assessment Methodology User Guide.

# 3 Building National Capacity

## 3.1 USAR Response Framework

The INSARAG Guidelines defines USAR as the "processes used to safely remove and medically treat entrapped victims from collapsed structures." Typically, these steps are used following large-scale structural collapse incidents caused by sudden-onset events such as earthquakes, cyclones or terrorist activity.

In order to understand the context of this manual, it is important that there is an understanding of the concept of continuous rescue at structural collapse incidents. This concept covers the chronological steps of rescue from spontaneous volunteers rushing to assist in the immediate aftermath of a collapse and the response of the local emergency services within minutes. It continues with the arrival of regional or national rescue resources within hours through to the response of international rescue teams in the days after the event. Based on the chronological steps in a rescue response, the INSARAG Response Framework is shown in Figure 3.


*Figure 3: INSARAG Response Framework*

The INSARAG Response Framework is a diagrammatic representation of all levels of response, starting with spontaneous community actions immediately following the disaster, which is supplemented initially by the local emergency services and then by national rescue teams, including specialised resources. Finally, there is the response of national and/or international USAR Teams, supporting national rescue efforts.

Each new level of response increases the rescue capacity and overall capacity but has to integrate with and support the response already working at the disaster. In order to ensure inter-operability between the levels of response, it is vital that working practices, technical language and information is common and shared across the whole response framework. Adoption of the INSARAG Guidelines, and more specifically Volume II of the Guidelines, would support ensuring this common and shared framework at all levels of

response. Therefore, the USAR Response Framework can be used as a basis to establish principles and working practices that relate to all levels of operational preparedness, capacity building, training and capability assessment.

## 3.2 Establishing a National USAR Capacity

There are many things to consider once a decision is made to expand a local search and rescue capacity into a national USAR capacity. A different assessment will need to be completed before the initiative begins. Things to consider include:

- Is there a need for USAR in the country?
- What capacity level should be considered?
- What systems and mechanisms need to be established to manage, monitor and develop USAR capabilities?
- What kind of national laws, regulations and standards to be considered and developed?
- Who should be involved in conducting a national risk assessment?
- How do we expand recruitment and retention for new positions?
- What additional training is necessary for team members?
- Are there new dangers to personnel involved?
- How will the expanded team be funded?
- What number of members is needed? Which redundancy model should be used?
- What equipment will the team need?

**Recruitment of new members and retention of those trained**

Expansion of a technical rescue team to a USAR Team will require careful planning to ensure all operational and administrative requirements are met. After completion of the need's assessment, the next step would be consideration of how to recruit new members, and develop a plan on how they will be retained.

When considering a recruitment plan it is important to first recognise the changing mission of the team. A USAR Team is required to have the following functions:

- Management.
- Search.
- Rescue.
- Medical.
- Logistics.

Not specifically referred to, but equally important, is the inclusion of licensed structural engineers, hazmat specialists, communications, physicians and other medical staff, riggers, media relations, and, if intended for international response, trained personnel needed to staff a Reception/Departure Centre (RDC) and/or the USAR Coordination Cell (UCC). For definitions of RDC and UCC respectively, please refer to Annex D. For greater understanding of these two concepts and its application during an international response, please refer to Manual B: Operations and the USAR Coordination Manual.

The recruitment plan should consider personnel required to provide:

- Physical and technical search and rescue operations in damaged collapsed structures.
- Canine search if not already part of the existing team.
- Medical care to task response personnel and assigned canines.

- Medical care for the entrapped victims.
- Reconnaissance to assess damage and needs and provide feedback to the LEMA and/or UCC.
- Assessment/shut-off of utilities to houses, buildings.
- Hazmat surveys/evaluations.
- Structural/hazard evaluations of government municipal buildings needed for immediate occupancy to support disaster relief operations, stabilising damaged structures, including shoring and cribbing necessary to operate within a structure.

### 3.2.1 Capacity Building

The INSARAG network is strongly encouraged to assist disaster prone countries in developing the capacity of their national USAR Teams. In this context, the term “national USAR Team” refers to a USAR Team, which is utilised at the national level but not designed to deploy internationally. This can be a governmental team or non-governmental team. INSARAG has utilised the experience gained both in the INSARAG External Classification (IEC) process as well as in existing capacity building programmes of its members, including National Accreditation Processes (NAP), to develop recommended organisational and operational standards for national USAR Teams in order to provide Member States with guidance for the development of national USAR capacity.

The guidance is meant to provide globally accepted standards for national USAR Teams to develop an operational and organisational capacity. By promoting common standards for national USAR Teams, the INSARAG network aims to provide guidance for capacity building efforts as well as enhance the interoperability of national USAR Teams with international teams in major emergencies within their countries.

Furthermore, the recommended standards for national USAR Teams provide a valuable tool to the INSARAG community to promote and disseminate the INSARAG Guidelines and methodology to the vast majority of USAR Teams worldwide that are for national use.

The organisational and operational guidelines for national USAR Teams are developed as a guidance document for capacity building of national teams so that there are common operational standards around the world. Countries with INSARAG classified international USAR Teams (Classified USAR Team) are strongly encouraged to assist the capacity building process in developing countries and to provide guidance to other national teams in their own country.

Countries that are in the process of developing a national USAR capacity are encouraged to adopt (at the appropriate level) the INSARAG Guidelines for capacity building of national USAR Teams. This could be a target to be achieved. They could adopt the appropriate processes for the confirmation of achievement of these standards, such as the establishment of a national accreditation mechanism. As a first step, teams are strongly encouraged to conduct a self-assessment of their national USAR Team’s capacity based on the checklist that are found in the INSARAG Guidance Notes.

These processes and steps are reflected in Figure 4 below.

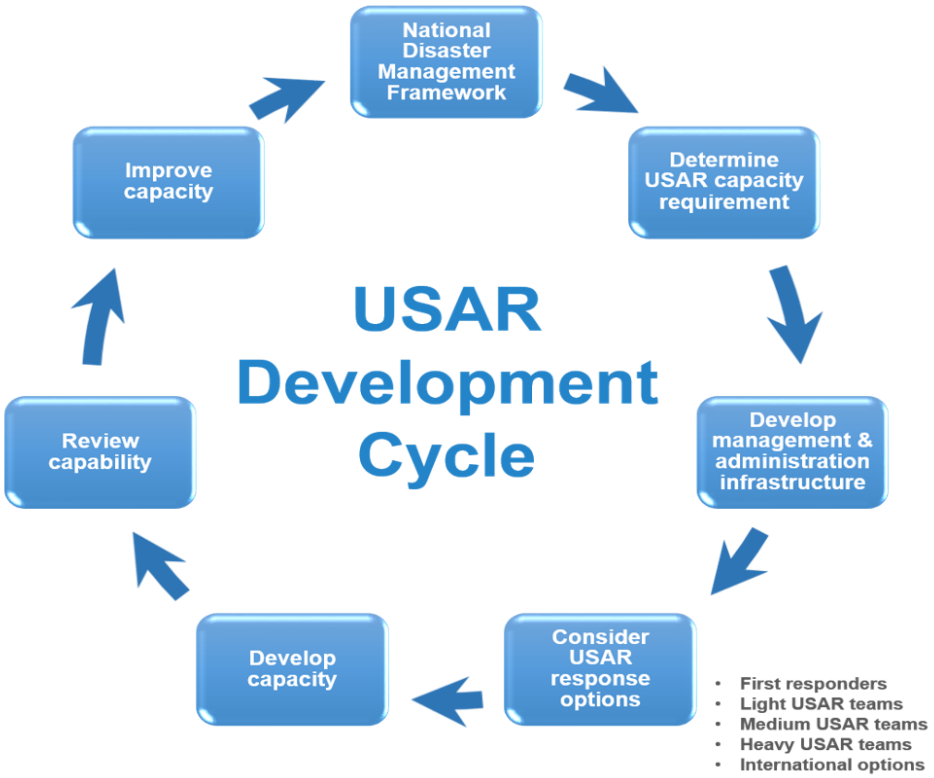



*Figure 4: USAR Development cycle.*

### 3.3 Developing a National USAR Management and Administration Infrastructure

Once the appropriate government officials (national, regional and/or local) have determined the need for a national USAR capacity, it should commence development planning commensurate with the level of needed USAR capacity. As work begins to develop the resource, the government should also revise its legal framework for disaster response to include the management, administration and utilisation infrastructure of the proposed USAR capacity.

There will be the need to design both the administrative and financial management tools for the USAR capacity. These documents will:

- Define the policy and procedures.
- Make provision for initial or 'start-up' funding for the preparation of USAR disaster response.
- Make provision for ongoing annual funding that should be sufficient to allow the USAR capacity to maintain a high standard and condition of operational readiness.
- The administrative and financial documents should also define:
    - The duties and responsibilities of management and administrative positions.
    - The organisational responsibilities and roles.
    - The process through which the USAR Team will administer annual funding.
    - The record management processes.
    - How property is accounted for.
    - How new members are selected.
    - How members receive initial training.
    - The ongoing training required to allow members to remain operational.

Once an effective management and administration infrastructure is in place, the alternative response options need to be considered which include:

- The approach selected should be based on both the likely rescues (number and degree of difficulty) required in the event of a disaster as well as the ability to procure appropriate equipment, recruit appropriate people and train them (initial and ongoing).
- That the majority of people rescued after a disaster are lightly trapped and therefore recoverable by the first responders and USAR Teams that are available locally and on scene quickly. This makes incorporating all levels of response into disaster planning critical.
- Unless more difficult and technical rescues are envisaged, there is no requirement to progress to another level and develop a more technically capable team.
- Structured teams with a Medium or Heavy capacity are more expensive to develop and maintain, and are not as quick to deploy due to the time it takes to assemble and move their staff and equipment, in comparison to the teams with Light capacity.

As seen when developing a local technical rescue team, it is often better to maintain a lower level capacity in an effective and efficient manner, than to try to develop a larger capacity resource and not be able to maintain the required skill and equipment levels.

Structured teams have the advantage over untrained spontaneous volunteers by providing for an organised rescue capacity thus reducing the risk of injury or death to themselves and the victims.

### 3.3.1 USAR National Accreditation Process

The vital component in developing national capacity is the establishment of a national accreditation mechanism. Such mechanism allows a country to establish, monitor and manage officially approved standards and adhere closely to the INSARAG guidance in developing its USAR national response systems. In line with the INSARAG Response framework, the establishment of a USAR National Accreditation Process is strongly recommended.

The word **classification** is attuned to the INSARAG Guidelines requirements for international deployment and the word **certificatio**n is one of the key components of the national accreditation process. The national authority, with the relevant laws and regulation, is the ultimate authority to establish and certify that teams meet the national standards, in line with the INSARAG Guidelines.

**Development of the National Accreditation Framework**

The National Accreditation Framework Development should have a high level of political support and commitment to ensure a sustainable and stable process. Hence, the USAR programme should be incorporated into the National Disaster Management system to ensure completeness of its development, implementation and funding. As such, commitment to an accreditation system is a critical prerequisite of the sustainability of standards and should be an integral part of the country's national regulations to allow the development and consolidation within public policy.

The following elements should be considered during the development of national accreditation systems:

- Focussed planning of the process by the national authority to develop the accreditation system.
- Identification of stakeholder institutions or organisations that are to participate in the development of the accreditation system, including the training of national USAR Teams.
- Appropriate, sustainable and qualified staffing for the development of the accreditation system.

- Participation of all relevant national players subject to the accreditation system to validate and support the accreditation process.
- Transparency within the system and during the accreditation process at all times.

The NDMA, as the process lead, can mandate – with an official document - an accrediting entity or body. Suitable entities may be, and are not limited to, an academy, national fire and rescue authority or civil defence. The entity must guarantee a transparent and participative implementation process of the accreditation system by ensuring agreements and solutions in favour of all relevant parties.

This entity must further ensure that the development process is consistent with national needs and promote the development as well as professionalisation of USAR groups, taking advantage of achieved experiences through the accreditation process. In this regard, the following is recommended for the creation of an accreditation process:

- The establishment of a Technical Committee for the accreditation that has a committed, sustainable legal mandate, financial support and technical conditions to function.
- The involvement of USAR national stakeholders to ensure that the system has adequate and focussed representation.

The accreditation body is responsible for the development of relevant documentation for the accreditation system through a public resource recognised by all stakeholders and should be an accepted standard that regulates and ensures the functioning of the process.

The control mechanism of the accreditation process is to provide assurance to the accrediting entity that relevant procedures are conducted in a transparent manner, and acceptable technical conditions have been provided.

The National Accreditation Process is further described in Figure 5 and can only be executed after the establishment of an official national policy, embedding the process within a national commitment.

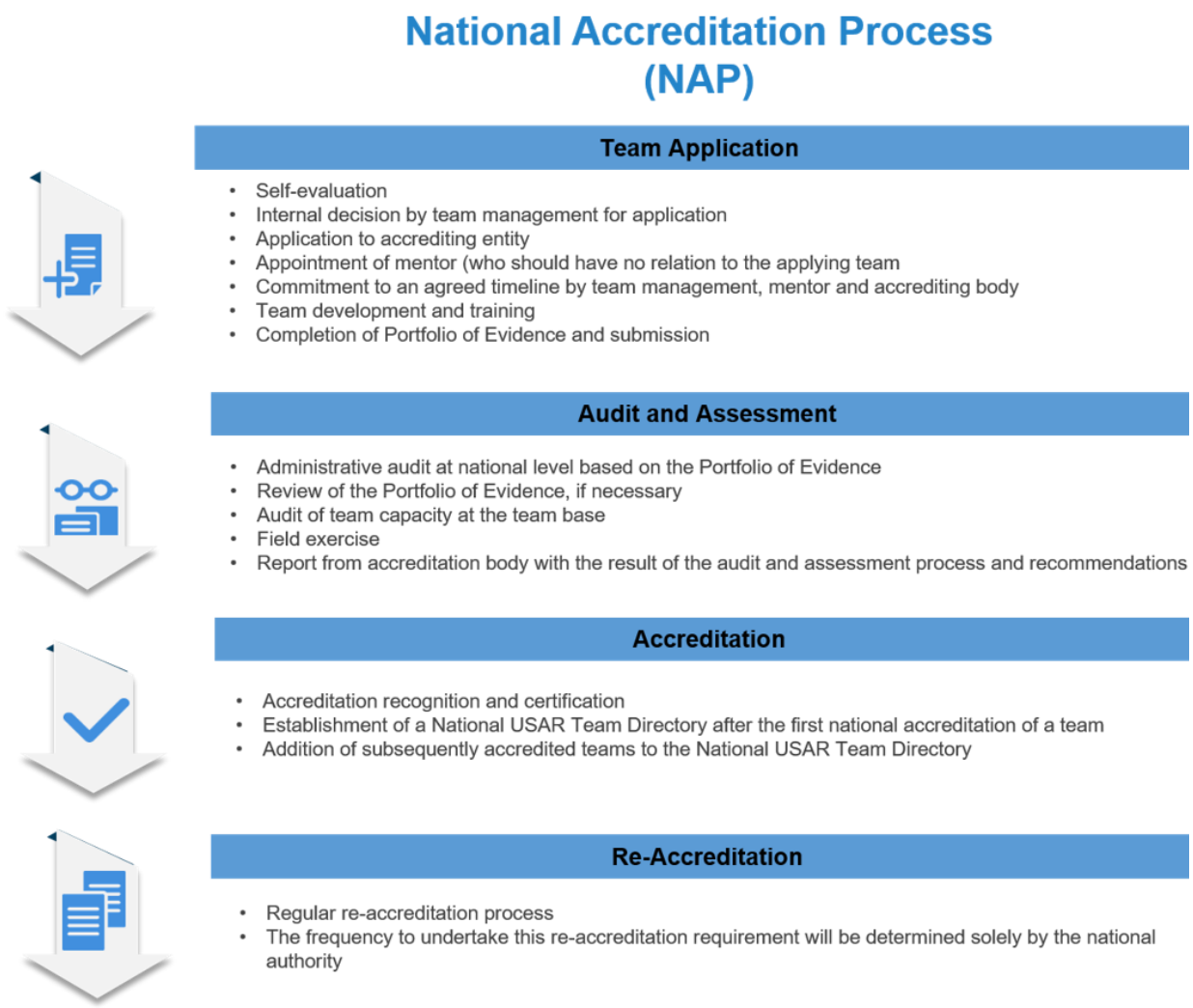



*Figure 5: National Accreditation Process (NAP).*

### 3.3.2 National Responsibility

Once a national USAR Team achieves recognition from its national authorities, the INSARAG Policy Focal Point can inform the INSARAG Secretariat if so desired. The INSARAG Secretariat will register this team as a "nationally accredited USAR Team" at the level of Light, Medium or Heavy in the USAR Directory.

**Note:** Any external confirmation is voluntary, optional and complementary to national processes and is not to be confused with the INSARAG IEC process. For a USAR Team that is planning to deploy internationally, the INSARAG IEC process remains the only classification system.

### 3.3.3 INSARAG Recognised National Accreditation Process

Since 2005, INSARAG has an external USAR Team classification process (IEC), which establishes verifiable operational standards, and which constitutes an example of how a peer review mechanism can provide an added value in the preparedness and response to disasters. The IEC process is designed for teams that have the mandate and institutional support for responding internationally.

Building on the success of the IEC process, the purpose of the INSARAG Recognised National Accreditation Process is to provide a general framework for international advisory on national USAR capacity building and the establishment of an INSARAG recognition system for National Accreditation Processes (NAP) of USAR Teams.

This recognition by INSARAG of a national accreditation process is to be executed through an established and clearly-defined process, including procedures, verification checklists and evaluation methodology through the INSARAG-Recognised National Accreditation Process (IRNAP), as explained in the following sections.

At the global level, any NAP which has met the INSARAG standards will be referred to as an IRNAP. Countries who successfully undergo the IRNAP are required to report back to the INSARAG Secretariat on successful nationally-accredited teams, whose details will be updated in the INSARAG USAR Directory.

**INSARAG Support Process Principles**

The INSARAG support process for the NAP development and recognition is based on the following principles:

- **Voluntary:** the process shall be completely voluntary and interested countries shall make a formal request to the INSARAG Secretariat in order to obtain support.
- **Supported at the regional level:** each region should form a roster of experts with appropriate and suitable profiles (USAR experience, experience with the INSARAG methodology, language etc.) shall be formed and endorsed by the Regional Chairs.
- **Member State commitment:** Member States which have received support through this process from the regional roster shall also commit to provide appropriate experts in turn and support their participation in the recognition process for other member states.
- **Commitment to the INSARAG methodology:** the requesting Member State shall demonstrate an adoption of the INSARAG methodology in their national framework.
- **Funded by the requesting Member State:** the requesting country shall cover the costs related to the support process, via bilateral agreements, donor support, or otherwise.

**Designation of the Roster of Experts to Support the IRNAP Process**

In order to support countries in establishing their National USAR Team Accreditation Processes and reviewing their adherence to the INSARAG methodology, Regional Groups are encouraged to establish a roster of experts who have the appropriate profile and have been endorsed by the Regional Chairmanship Group.

From this roster, the experts are selected to form two types of groups: the **Technical Support Group (TSG)** and the **Technical Recognition Group (TRG),** with the respectively the following functions:

- TSG: Support and advise national systems on the implementation of their national USAR team accreditation process in compliance with the INSARAG minimum criteria, steps and standards.
- TRG: Review the actual achievement of the INSARAG criteria, steps and standards for national accreditation processes and recommend to the Secretariat the external recognition by INSARAG of the national accreditation process.

Whilst the TSG is established at regional level to respond to requests from countries within the region, individual experts can form part of the TSGs of other INSARAG regions provided that they have been approved by the receiving Regional Chairmanship Group. Regional Groups may choose to encourage inter-

regional TSG membership in view of the benefits of multicultural cross-learning from different experiences, but they need to beware of the challenges that arise in coordinating the work of a multiregional TSG (due to time-differences or language barriers, etc.).

The experts should comply with the following minimum criteria:

- USAR experience (USAR processes and training).
- Experienced in USAR operations/coordination.
- Experience INSARAG methodology.
- Experienced with a national accreditation process and/or IEC/R process.
- Sufficient knowledge of the regional context and in the relevant languages of the region.

To form the regional roster, Regional Groups, with the support of the Secretariat, will issue a call for experts and it is recommended to use the application form found in the Guidance Notes. The Regional Chairmanship Group will review the applications, and based on recommendations from the Secretariat, will select suitable candidates for the roster membership. Regional Groups are encouraged to establish two categories of experts on the roster, namely members and observers.

- **Members:** experts who comply with all established criteria are to be approved as “members”
- **Observers:** Experts who have considerable experience but may lack a specific aspect, (for example: experience with a NAP or IEC/R), may be approved as “observers” with the aim of gaining the required experience to become a full roster member. The acceptance as “observers” on the roster is at the discretion of the Regional Chairmanship Group. The “observers” may form part of a country-specific TSG if the requesting country accepts it.

The Regional Chairmanship Group shall establish the periodicity of the call for experts in view of maintaining functioning roster of experts. With each new call for experts, the Regional Chairmanship Group shall also review the status of “observers” to evaluate if they have gained the required experience to become “members” of the roster.

Applicants to become members or observers of the roster will upload their application form containing their relevant experience to the Virtual On-Site Operations Coordination Centre (VOSOCC) using their respective account. Hence, the Secretariat will be enabled to share this information with the country who requests the support from the roster.

**Request process for INSARAG Recognition of National Accreditation Process**

The interested Member State can submit a request to the INSARAG Secretariat through the INSARAG Focal Point of that country. The request shall contain at least the following information:

- Requesting country.
- Date of request.
- Requesting authority.
- Implementing authority and all participating institutions.
- Information on the actual request (e.g. support in the establishment of a process or the review of an existing process).
- Contact details of the INSARAG Policy Focal Point.
- Contact details of the INSARAG Operational Focal Point.
- If the contact person for this request is none of the INSARAG Focal Points, the contact details of the designated person as counterpart.

- Place of implementation, if relevant.
- Estimated dates of beginning and finalisation of the process.

The request shall be accompanied by a commitment declaration of the requesting Member State to the Secretariat, in which the Member State commits to:

- Comply with the steps and criteria of the IRNAP in line with the INSARAG methodology and guidelines.
- Cover the funding of the process and the activities, which will emanate in each of the steps of the process, including the possible costs of travel (transport, accommodation, meals etc.) of the TSG and ensure the security of the TSG when deployed.
- Implement the recommendations of the TSG.
- Maintain a contact person for the TSG as well as the appropriate means of communication.

In addition to the above-mentioned information, the requesting Member State is also required to submit a self-evaluation of the current status of the extent of achievement of the NAP, which should be based on the verification checklist that can be found in the INSARAG Guidance Notes.

**The INSARAG-Recognised National Accreditation Process**

If requested, the TSG can advise the Member State in the implementation of the national USAR Team accreditation process. The requesting Member State and the TSG are to mutually determine the methodology and duration of the advisory phase and activities (virtual meetings, electronic correspondence, face-to-face meetings, etc.). Terms of Reference for the support to be provided by the TSG should be agreed upon before the initiation of the process. Standard terms of reference are provided in the Technical Reference Library.

The different modalities for the support will depend on the level of progress of the national USAR process, and more specifically, the national USAR Team accreditation process.

The progress can be characterised in three tiers:

- **Design level:** is a country which has no national framework in place, requesting support to establish a standardised national process.
- **Advanced level:** is a country partially achieving standards and requests support for full implementation.
- **Consolidated level:** is a country that fully achieves all standards and requests support in the verification thereof.

The following table summarises the activities that should be developed during the support stage, which are mainly related to the interaction between the TSG and the requesting country:

| Stages of the support process | Maximum suggested time |
|---|---|
| 1. Review and achieve consensus on the self-assessment of the requesting Member State:<br><br>• Clarification or requesting additional supporting documentation on the self-assessment provided by the country.<br>• The TSG can consult with the Member State and the Secretariat before finalising its review of the self-evaluation.<br>• The aim is to have a consensus vision on the self-assessment.<br>• The TSG will use the same "colouring methodology" to assess progress in each of the items of the self-assessment as it does for the final verification. Refer to the evaluation methodology section. | 90 days |
| • Adoption and agreement of terms of reference for the TSG; elaboration and agreement of the support workplan according to the level of progress of the national process (consolidated, advanced or design):<br><br>• The TSG will elaborate a proposal of the workplan and present it for discussion with the requesting country. Both parties shall agree on the workplan.<br>• In many cases, in particular when the country is at the design level of its national process, a face-to-face meeting is mandatory and of great importance to be able to explain the scope of the INSARAG national standards, as well as the steps and criteria for a national accreditation process.<br>• As part of the mutually agreed workplan, the TSG and the requesting country are to establish a timeline with deadlines for the achievement of the distinct outputs, as well as a timeline for meetings, communications, and if necessary, face-to-face meetings for monitoring the progress.<br>• Determine if the country wishes the TSG to observe an accreditation exercise as a part of the accreditation process, requiring visit to the country. It should be noted that this is not compulsory.<br>• The TSG and the requesting country are to agree on a system for the exchange, management and archiving of relevant documentation.<br>• The requesting country is expected to create a dedicated working group to ensure follow up and implementation of the process. | 30 days |
| 2. As mutually agreed in the workplan, presentation by the requesting country on the progress reports demonstrating the implementation of the national USAR accreditation process:<br><br>• The same format used for self-assessment shall be used through a live document. | 30-180 days |
| 3. Review of the progress reports by the TSG and presentation of observations to the requesting country, keeping the INSARAG Secretariat informed. | |
| 4. Joint analysis by the TSG and the requesting country of the progress in the implementation of the national process:<br><br>• For this analysis, the full verification checklist is to be used as well as the list of criteria and steps on the national accreditation.<br>• In line with this joint analysis, the TSG and the requesting Government shall determine to the appropriate time to proceed to the final verification visit or whether the process needs to be redesigned or extended.<br>• If relevant, the TSG prepares the report to be presented to the Secretariat recommending initiating the next stage of recognition. | 30 days or more if it is decided to redesign or extend the process |

*Table 1: Stages of the support process.*

Once it is ascertained by the TSG and the country that the standards requested in the Support Stage of the process have been reached, the next stage is initiated to carry out the final verification visit by the TRG.

The following table summarises the activities that should be carried out during the recognition stage, based on which it will be determined if the requesting country complies with the INSARAG standards in its national accreditation process.

| Stages of the recognition process | Maximum suggested time |
|---|---|
| 1. **Designation of the Technical Recognition Group:** the INSARAG Secretariat will send the request to the experts within the regional roster who will in turn respond with their availability to visit and verify the country. The INSARAG Secretariat will choose two experts from the region, with the option of adding / accepting additional observers as part of the TRG. The INSARAG Secretariat will accompany the experts in the verification visit.<br><br>• The TRG's responsibility is to have a global vision and ensure the quality of the process in terms of INSARAG criteria, steps and standards for the external recognition by INSARAG. | 30 days |
| 2. **Verification of compliance with the standards, steps and criteria of the national accreditation process:** the country and the Technical Recognition Group will determine the appropriate time to carry out the (mandatory) visit to the requesting country during which the entire national accreditation process will be reviewed.<br><br>• The detailed agenda of the visit and the expected results must be agreed prior to the visit, between the TRG and the requesting country through the INSARAG Secretariat. The agenda shall include:<br>o Meeting with authorities<br>o Meeting with the Accreditation Committee<br>o Presentation of final documents.<br>o Review of the exercise methodology.<br>o Application of the verification instrument during the exercise.<br>o Observance of a accreditation exercise of a national team to review the application of the exercise verification instrument<br>• In case of non-compliance with a standard, criteria or step of the national accreditation process, a timeline for its implementation is agreed with the country, as well as the method of evaluation of this (which, to the extent of if possible, should not involve another physical visit to the country by the TRG) | |
| 3. **Final report:** The Technical Recognition Group will prepare a report of its activities and the verified and share it with the requesting country and the INSARAG Secretariat. It must be accompanied by the verification instrument.<br><br>• The Secretariat informs the Regional Chairmanship group about the result of the INSARAG recognition of the national accreditation process | 15 days |
| 4. **Feedback process and improvement of the methodology:** It is considered necessary that the methodology of the TSG and TRG respectively and the work modalities be constantly improved with the experience acquired in each process. In this context, each of these groups is expected to document their experience in a feedback report addressed to the INSARAG Secretariat and the regional list of experts in order to serve future processes and the continuous improvement of the methodology | 15 days |

*Table 2: Stages of the recognition process.*

Further guidance can be found in the IRNAP Manual that can be found in the INSARAG Guidance Notes.

### 3.3.4 Verification checklist on the INSARAG national standards

The verification checklist will be used in Microsoft Excel format and is available in the INSARAG Guidance Notes. The TRG will use this checklist for its final assessment, but it also serves the requesting country as guidance on the requirements to be incorporated into the national USAR standards.

The TRG will use an evaluation methodology which implies the determination of the level of progress in the implementation of the INSARAG national standards, categorising the progress in four levels in accordance with the following colour coding:

- **GREEN** or "Y" (for "Yes") means that in this aspect the country fully meets or exceed the minimum standards
- **YELLOW** or "M" (for "Meet"). Means that this aspect is met but that additional improvement is recommended. When an aspect is marked as yellow, the reasons shall be given in the observation's column of the verification checklist.
- **ORANGE** "RT" (meaning "Requires time ") means that this aspect still does not meet the minimum standards as it depends on conditions which threaten the achievement of the standards. (such as for example a document that exists but is not yet officially endorsed by the competent authority). In this case, the TSG and the country agree on a timeline for its implementation, as well as on a verification method.
- **RED** or "NY" (meaning "Not Yet") means that this aspect does not meet the minimum conditions. If an aspect is marked as red, it is considered that this does not meet the INSARAG minimum standard. In this case, the TSG and the country agree on a timeline for its implementation, as well as on a verification method.

This methodology will be used both for the review of the self-assessment (including the progress reports) with the aim of prioritising the areas which require a specific focus in the workplan, as well as for the final verification of achievement of the national standards and the criteria and steps of the accreditation process.

In order for the TRG to recommend to the INSARAG Secretariat the issuance of the certificate of recognition to the requesting country, the final evaluation shall have all aspects in either yellow or green.

### 3.3.5 Role and responsibilities of the stakeholders

In this section the roles and responsibilities of the different stakeholders of the IRNAP process are summarised:

a) Requesting country:
   - Respect the criteria for the recognition by INSARAG of the national USAR accreditation process.
   - Provide experts to the regional roster of the TSG/ TRG.
   - Commitment to the INSARAG methodology.
   - Have a national USAR System.
   - Have a national USAR team accreditation process.
   - Cover the costs of the TSG for two recommended visits.

b) Technical Support Group (TSG):
   - Advise and support in the implementation of the National USAR Accreditation Process.

- Undertake document and field review of the implementation of the INSARAG criteria, steps and standards.
- Present a report of the support phase and the progress of the country to the INSARAG Secretariat.
- Submit a self-evaluation of the methodology to the INSARAG Secretariat at the end of the process.

c) Technical Recognition Group (TRG):

- Apply the format for verifying compliance with national INSARAG criteria, steps and standards.
- Recommend recognition based on the compliance with INSARAG criteria, steps and standards.
- Submit the final verification report.
- Submit a self-evaluation of the methodology to the INSARAG Secretariat at the end of the process.

d) INSARAG Secretariat:

- Upon request from a country, send the request to the roster of TSG/TRG.
- Accompany the TSG and TRG at all times.
- Select the experts of the TRG.
- Accompany the country visit to the TRG
- Seek funding for the TRG to cover the travel costs of the verification visit.
- Publish the call for experts for the regional roster.
- Review the applications and verify compliance with the minimum requirements for the presentation of those who have the profile to the Regional Chairmanship Group.
- Present the candidates to the Regional Chairmanship Group.
- Follow up on countries that have obtained recognition.
- Inform countries of the period of validity of INSARAG recognition.
- Prepare and deliver the certificate of recognition.

e) Regional Chairmanship Group:

- Request the INSARAG Secretariat to issue the call for experts for the roster of TSG/TRG.
- Approve roster candidates from the region.

### 3.3.6 Recognition of the National Accreditation Process

Following the receipt of the final report from the TRG, the Secretariat will issue a recognition in the form of a certificate to the national emergency management authorities, who are in charge of the national USAR accreditation process. A sample certificate of recognition is provided in the INSARAG Guidance Notes.

Accrediting countries are required to report back to the INSARAG Secretariat on successful nationally-accredited teams, whose details will be updated in the INSARAG USAR Directory.

Countries, whose accreditation processes are recognised by INSARAG, may decide to issue nationally-accredited teams with standardised patches. The purpose is two-fold: to ensure the standardisation of recognition and visibility, and to inform other national and international responders on the teams' capacities.

The following conditions should be considered for the nationally-accredited USAR teams should they decide on visibility in the field:

Rectangle patch of the following size: 75mm x 55mm.

- Support the implementation of the INSARAG Hyogo Declaration and the UN General Assembly resolution 57/150.
- Black wordings over white background and a squared light grey outline.
- The flag of the accrediting country of the following size: 60mm x 40 mm.
- The patch indicates the following:
    - The words “Nationally Accredited.”
    - Name of the accredited team.
    - The level and the year of accreditation.
    - INSARAG logo of the following size: 22 mm x 10 mm.

A template for the standardised patch and generic example are presented as follows:

Template


*Figure 6: Template for the standardised patch.*

Example


*Figure 7: Template for a generic example of a patch.*

### 3.3.7 Supporting documentation for the IRNAP

Suggested supporting documents, which national USAR systems may wish to adopt and/or adapt as templates for teams to complete in order to prove that they are achieving the national standards, are provided in the INSARAG Guidance Notes. A series of documents are suggested, all of them directly linked to the INSARAG national standards. Additionally, standard formats are available as practical implementation tool for these documents although it is clear that there may be significant variations from one country to another.

### 3.3.8 Maintaining National USAR Capacity

Imperative to maintaining the USAR national capacity is the need for the national mechanism to be tested and validated regularly, both at the local and national level. This could be achieved through platforms such as scenario planning, table-top and ground deployment exercises. Such activities must involve key stakeholders and partners such as the local community, private organisations (which includes NGOs) and relevant governmental entities. The importance to establish and testing the Whole-of-Government mechanism in validating the national emergency mechanism is critical to the success of the entire response systems. For some, these validation exercises could also be extended to involve the INSARAG Regional Group and countries of the region.

The INSARAG network conducts annual earthquake response simulation exercises in disaster-prone countries with the objective of practising the INSARAG methodology with national and international

responding organisations. Disaster-prone countries are strongly encouraged to host such exercises as part of developing the national capacity. Please refer to the INSARAG Guidance Notes.

## 3.4 USAR Team Structure and Organisation

The INSARAG methodology suggests that a USAR Team be developed in stages, as was demonstrated for a technical rescue team in Chapter 2: Building Local Capacity. This lessens the potential for missed educational opportunities at the foundational level, expands the knowledge base of team members and aids in team building.

The INSARAG methodology strongly suggests that a developing team must first come from a foundation to build from the bottom up, rather than the top down. By this, a new USAR Team should not start development at the Light, Medium or Heavy level until it can first demonstrate proficiency and value at the first responder level.

The entry level into organisation of a USAR Team is usually at the First Responder USAR capacity. This follows a scheme of enhancement to the initial technical rescue team and uses many of the same structures. The role of a First Responder USAR Team is that of:

- Reconnaissance and survey of the affected area.
- Identification of hazards and undertake actions to reduce the level of risk.
- Control of public utilities.
- Isolation of hazmat and identification if it can be safely done.
- Surface search and rescue.
- Initiating medical care and extrication of victims.
- Establishment of Casualty Collection Points.
- Assisting international teams to integrate into local emergency management arrangements.

The structure of a First Responder USAR Team is based on the concept of maintaining a surface rescue capacity at one worksite. The team will be capable of conducting rescues from structures of wood or light metal components, unreinforced masonry, adobe or raw mud and bamboo. The search component will have the ability to carry out a surface/physical search. The team's rescue component will be equipped with hand-operated cutting tools, and ropes and bars for lifting and cribbing materials for stabilising damaged structures.

Annex C contains suggested performance standards, training and equipment requirements for all USAR Team levels.

### 3.4.1 Urban Search and Rescue Teams: General description

Urban Search and Rescue Teams will be specialised teams and recognised in three capability and capacity levels:

- **Light USAR:** National (Accredited), and/or International (IEC/R Classified).
- **Medium USAR:** National (Accredited), and/or International (IEC/R Classified).
- **Heavy USAR:** National (Accredited), and/or International (IEC/R Classified).

The significant difference between Accredited teams and Classified teams is the ability of Classified teams to deploy internationally to support other countries. Accredited teams will have the same technical capabilities but will respond within the country's sovereign borders or bi-laterally through agreement.

### 3.4.2 Light USAR Teams

A Light USAR Team comprises the five components required by the INSARAG Guidelines (Management, Logistics, Search, Rescue and Medical). Light USAR Teams have the ability to conduct technical search and rescue operations in collapsed structures of wood, masonry, and light reinforced concrete construction. The Light team will also have the capacity to conduct rigging and lifting operations. Light USAR Teams will be similar in technical skills to Medium and Heavy USAR Teams. Light teams will be capable of completing a search and rescue to ASR3 on worksites. A Light USAR Team suggested personnel is between 17 and 20 personnel, with the ability to deploy one person to INSARAG support (UCC/RDC) for the duration of the deployment. The Team's logistics component will be capable of establishing a Base of Operations (BoO) including shelter, sanitation, tool repair, feeding, and hygiene arrangements.

A Light USAR Team:

- Is required to have the capacity to work on a single worksite.
- Is required to have the capability for search dogs and / or technical search.
- Must be adequately staffed and resourced to allow maximum 12-hour operations on one site (site may change) for up to five days.
- Must be able to medically treat its own team members (including dogs if present) as well as victims encountered if allowed to do so by the government of the affected country.
- Must be capable of conducting USAR operations to ASR3 level and integrating into the standard INSARAG reporting mechanisms.

A suggested staffing level in the following table will enable a Light USAR Team to carry out 12-hour operations on one worksite. Refer to Annex C for further information.

| USAR Component | Tasks | Suggested Staff Allocation | Suggested Number (17 to 20) |
|---|---|---|---|
| **Management** | Command | Team Leader | 1 |
| | Coordination / UCC / RDC / On-Site Operations Coordination Centre (OSOCC) | Deputy Team leader | 1 |
| | Planning / Information / Communications | Planning Officer | 1 |
| | Safety and Security | Safety Officer | 1 |
| **Search & Rescue** | Operations | Crew Leader | 1 |
| | Technical Search / Dog Search / Hazmat Assessment / Breaking and Breaching; cutting; shoring; technical rope; Lifting and moving | Search and Rescue team (including dogs if deployed) | 8 (Plus dogs) |
| **Medical** | Medical Team Management: Coordination and administration of medical team. Integration with local health infrastructure Care of team (including canines) and victims encountered | Medical Doctor and/or | 1 |
| | | Physician / Paramedic / Nurse | 1 |
| **Logistics** | BoO | Logistics Team Manager | 1 |
| | BoO | Logistician | 1 |
| | Water supply | | |
| | Food supply | | |
| | Transport capacity and fuel supply | | |

*Table 3: Suggested staffing level for a Light USAR Team.*

### 3.4.3 Medium USAR Teams

A Medium USAR Team comprises the five components required by the INSARAG Guidelines, i.e. Management, Logistics, Search, Rescue and Medical. Medium USAR Teams have the ability to conduct technical search and rescue operations in collapsed or failed structures of heavy wood and/or reinforced masonry construction, including structures reinforced with structural steel. They must also conduct rigging and lifting operations. Medium teams are expected to include RDC/UCC components, if applicable to national framework. The main differences between the two teams are as follows.

A Medium USAR Team:

- Is required to have the capacity to work only at a single worksite.
- Is required to have the capability of search dogs and/or technical search, and
- Must be adequately staffed to allow for 24-hour operations at one site (not necessarily at the same site; the sites may change) for up to seven days.
- Must be able to medically treat its team members (including search dogs if present) as well as victims encountered if allowed to do so by the government of the affected country.

A suggested staffing level in the following table will enable a USAR Team to carry out 24-hour operations on one worksite for up to seven days. Refer to Annex C for more information.

| USAR Component | Tasks | Suggested Staff Allocation | Suggested Number (Total 42) |
|---|---|---|---|
| **Management** | Command | Team Leader | 1 |
| | Coordination | Deputy Team leader | 1 |
| | Planning/Follow Up | Planning Officer | 1 |
| | Liaison/Media/Reporting | Liaison Officer | 1 |
| | Assessment/Analysis | Structural Engineer | 1 |
| | Safety and Security | Safety Officer | 1 |
| | RDC/UCC | Coordination Officer | 2 (If applicable to national framework) |
| **Search** | Technical Search | Technical Search Specialist | 2 |
| | Dog Search | Dog Handler | 4 |
| | Hazmat Assessment | Hazmat Specialist | 2 |
| **Rescue** | Breaking and Breaching; cutting; shoring; technical rope | Rescue Team Manager and Rescue Technicians | 14 (2 teams: 1 Team Leader and 6 Rescuers each) |
| | Lifting and Moving | Heavy Rigging Specialist | 2 |
| **Medical** | Medical Team Management: Coordination and administration of medical team, Integration with local health infrastructure, Care of team (including canines) and victims encountered | Medical Doctor | 1 |
| | | Physician, Paramedic, Nurse | 3 |
| **Logistics** | BoO | Logistics Team Manager | 1 |
| | Water supply | Transport Specialist | 1 |
| | Food supply | Logistician | 1 |
| | Transport capacity and fuel supply | Base Manager | 2 |
| | Communications | Communications Specialist | 1 |

*Table 4: Suggested staffing for a Medium USAR Team.*

### 3.4.4 Heavy USAR Teams

A Heavy USAR Team comprises the five components required by the INSARAG Guidelines, i.e.: Management, Logistics, Search, Rescue and Medical. Heavy USAR Teams have the operational capability for complex technical search and rescue operations in collapsed or failed structures that require the ability to cut, break and breach steel reinforced concrete structures, as well as delayer these structures using lifting and rigging techniques, setting up RDC/UCC component, if applicable to national framework.

A Heavy USAR Team:

- Is required to have the equipment and manpower to work at a Heavy technical capability at two separate worksites simultaneously. A separate worksite is defined as any area of work that requires a USAR Team to re-assign staff and equipment to a different location all of which will require separate logistical support.
- Is required to have both a search dog and technical search capability.
- Is required to have the technical capability to cut structural steel typically used for construction and reinforcement in multi-storey structures.
- Must be adequately staffed and logistically sufficient to allow for 24-hour operations at two independent sites (not necessarily at the same two sites; the sites may change) for up to ten consecutive days.
- Must be able to medically treat its team members (including search dogs as well as victims which the USAR Team is working to extricate prior to the medical handover. if allowed to do so by the government of the affected country.

A suggested staffing level in Table 5 will enable a USAR Team to carry out 24-hour operations on two worksites for up to ten days. Please refer to Annex C for more information and suggested equipment lists for Heavy USAR Team.

| USAR Component | Tasks | Suggested Staff Allocation | Suggested Number (Total 63) |
|---|---|---|---|
| **Management** | Command | Team Leader | 1 |
| | Coordination | Deputy Team Leader | 1 |
| | Planning | Planning Officer | 1 |
| | Liaison/Follow Up | Liaison Officer | 1 |
| | Media/Reporting | Deputy Liaison Officer | 1 |
| | Assessment/Analysis | Structural Engineer | 1 |
| | Safety and Security | Safety Officer | 1 |
| | RDC/UCC | Coordination Officer | 4 (If applicable to national framework) |
| **Search** | Technical Search | Technical Search Specialist | 2 |
| | Dog Search | Dog Handler | 6 |
| | Hazmat Assessment | Hazmat Specialist | 2 |
| **Rescue** | Breaking and Breaching: cutting; shoring; technical rope | Rescue Team Manager and Rescue Technicians | 28 (4 teams Comprising 1 Team Leader and 6 Rescuers) |
| | Lifting and Moving | Heavy Rigging Specialist | 2 |
| **Medical** | Team Care (Personnel and Dogs) Patient Care | Medical Doctor | 2 |
| | | Paramedic/Nurse | 4 |
| **Logistics** | BoO | Logistics Team Manager | 1 |
| | Water supply | Transport Specialist | 1 |
| | Food supply | Logistician | 1 |
| | Transport capacity and fuel supply | Base Manager | 2 |
| | Communications | Communications Specialist | 1 |

*Table 5: Suggested staffing for a Heavy USAR Team.*

## 3.5 USAR Training and Development Methodology

Training and development, both initial, joint, and recertification are critical to the successful implementation of any local USAR capacity building project and must cater for all the components of the team.

The USAR management and administration infrastructure is responsible for the development of a standardised process to identify training needs.

This might include:

- Identification of existing resources, procedures and competences.
- Self-evaluation to determine actual operational capacity.

- Gap analysis that will identify training requirements.
- Identification of pre-conditions for training to be effective.

Unlike the single role of the USAR first responders, the development of USAR Teams requires the training of people in the different roles that make up a USAR Team. Therefore, to support the development of USAR Teams across the globe, INSARAG recommends a training methodology whereby training is linked to an individual's position within a USAR Team.

Each functional position within a USAR Team has been identified and role descriptions developed. These role descriptions are common across all levels of USAR Team capacity – with variations to accommodate the different levels of skill and knowledge and can be found in Annex C.

INSARAG further recommends generic training requirements linked to team positions and role descriptions within the USAR Team structure. The training requirements are grouped into USAR Modules, facilitating organisations in developing USAR capacities as shown in Figure 8.


*Figure 8: USAR training methodology.*

Before a USAR Team commits to a deployment, it must understand that its mission may encompass more than search and rescue activities. Very often USAR operations and the beginning of early relief activities overlap; the USAR Team may be in a position to assist with other necessary operations at the request of the LEMA. Teams should only accept assignments commensurate with their capabilities.

The USAR Team, in consultation with its sponsoring organisation, should determine early on during a deployment if it will be able to assist with early relief. If it agrees to do so, it should confirm with the UCC Manager what it can do and how long it will be able to do it. This will assist the UCC Manager in scheduling such offers with the LEMA.

These tasks may include, but are not limited to:

- Situation and needs assessment including:
  - Infrastructure (roads and bridges).
  - Structures.
  - Coordination.
  - Fire safety.

    - Communications.
    - Electrical power.
    - Reservoir.
    - Water and sewage.
    - Hydro facilities.
- Food and water distribution.
- Shelter distribution and construction.
- Refugee camp assessment including:
    - External safety.
    - Internal safety.
    - Risk analysis.
- Water and sanitation assessment including:
    - System integrity.
    - Health risk analysis.
- Medical assistance including:
    - Nutrition assessment.
    - Health assessment.
    - Medical infrastructure assessment.
    - Medical care delivery.
- Donor centre logistics including:
    - Planning.
    - Receiving.
    - Distribution.
    - Management.
- USAR coordination personnel for:
    - RDC.
    - UCC.
    - Planning.
    - Technical information.
    - Liaison.
- Limited-scope hands-on training for local responders
- Logistics including staffing for:
    - Airports.
    - Seaports.
    - Transfer points.
    - Over the road trucking.
    - Railroads.
    - Warehousing.

### 3.5.1 USAR Team Positions

USAR Teams require the performance of different roles within the team structure in order to be effective. Each functional position within a USAR Team is identified and role descriptions are developed (please refer to Annex C). These role descriptions are common across all levels of USAR Team capacity – with variations to accommodate the different levels of skill and knowledge.

There are 17 identified positions based on the five components of USAR Teams:

| USAR Component | Position | Function |
|---|---|---|
| **Management** | Team Leader | Command |
| | Deputy Team Leader/Operations Officer | Coordination/Operational Control |
| | Planning Officer | Planning |
| | Liaison Officer/Deputy Liaison Officer | Liaison/Media/Reporting/RDC/UCC |
| | Structural Engineer | Structural Assessment/Analysis |
| | Safety Officer | Safety/Security |
| **Search** | Technical Search Specialist | Technical Search |
| | Search Dog Handler | Dog Search |
| | Hazmat | Hazmat Assessment |
| **Rescue** | Rescue Team Officer | Breaking/breaching/cutting/shoring/tactical rope |
| | Rescuer | Breaking/breaching/cutting/shoring/tactical rope |
| | Heavy Rigging Specialist | Lifting/Moving |
| **Medical** | Medical Team Manager (medical doctor) | Team care (personnel/search dogs) and patient care |
| | Paramedic/Nurse | Team care and patient care |
| **Logistics** | Logistics Team Manager | BoO Management |
| | Logistics Specialist | Food and water supply/base camp operations/transport capacity/fuel supply |
| | Communications Specialist | Communications |

*Table 6: Seventeen identified roles based on the five components of USAR Teams.*

Not all teams will contain all identified positions, and some may comprise more, dependent upon the specific and local requirements of the team structure and whether it is a Heavy, Medium or Light team. It is important though that each described role and function is performed consistently according to the SOPs in their respective countries.

### 3.5.2 USAR Team Training Requirements

As part of the role description, Annex C includes details of both the role-specific and the general training requirements for each position in the USAR Team.

The recommended training requirements are performance-based and are described in terms of Learning Outcomes and Performance Criteria that set out a minimum level of training outcomes that are suitable for USAR personnel at the levels identified.

Once a USAR Team has been certified by its government for national response, careful analysis should be done to determine if the team should become a part of that government's planning for international assistance to collapse structure incidents.

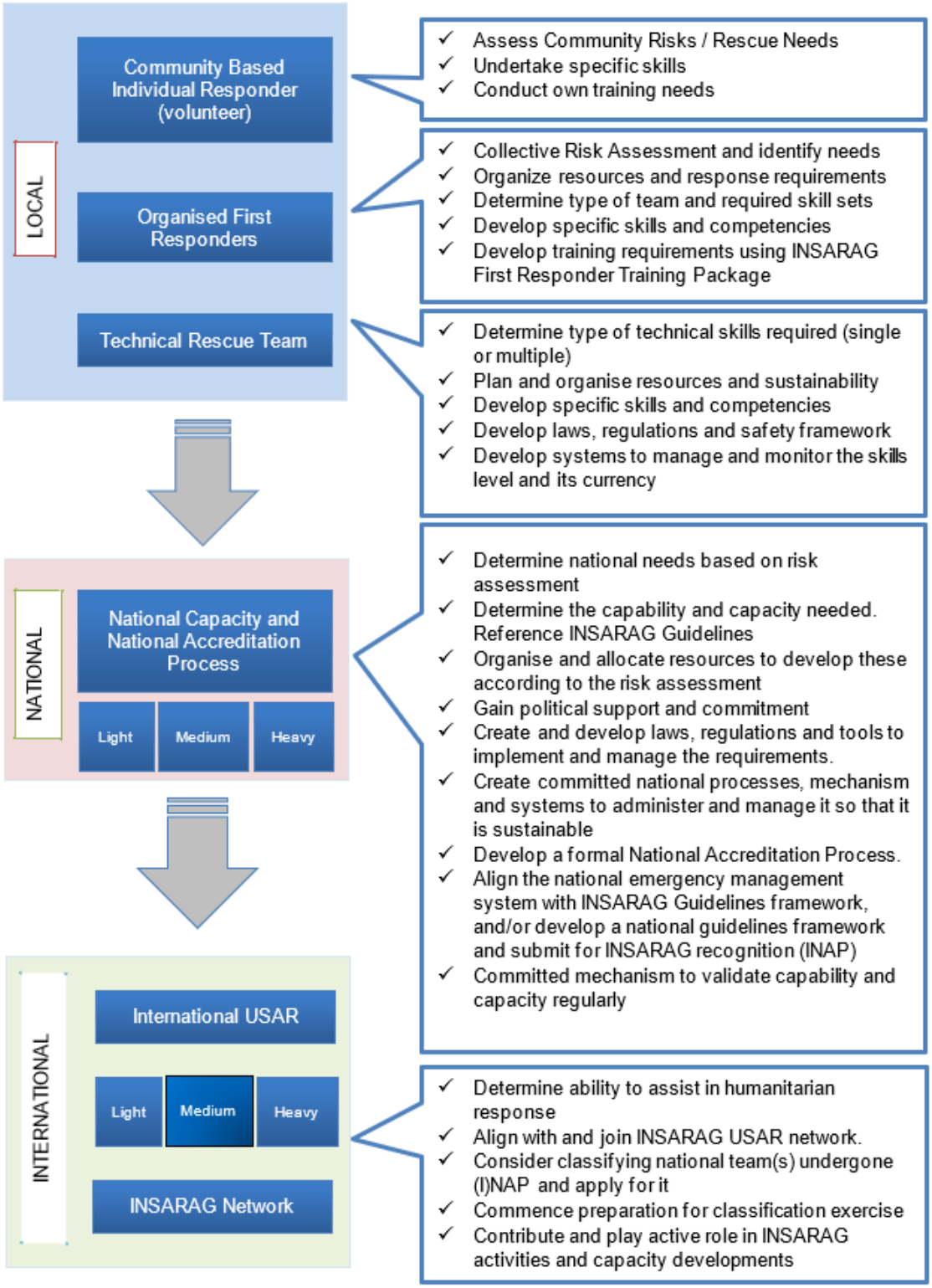
# 4 Conclusion

The contents of this manual are intended as a guide to assist countries and USAR Teams that have just started developing resources, those who are endeavouring to strengthen their existing resources. This manual is not supposed to be prescriptive, but rather to outline the experience of the INSARAG network and therefore to assist and enable the development of USAR capacity. That is, countries are advised to adapt the contents of this manual to their needs.

The INSARAG network welcomes further engagement and consultation with countries and USAR Teams that are interested in developing their capacity. Please contact the INSARAG Secretariat (insarag@un.org) for further details.

# Annexes

## Annex A: Roadmap for USAR National Capacity



## Annex B: Specific Technical Rescue Training Examples

The manual defines training levels as:

1. **Awareness Level:** This level represents the minimum capacity of organisations that provide response to technical search and rescue incidents. The support zone (or cold zone) is the area of a site that is free from incident hazards and may be safely used as a planning and staging area. All members of a technical rescue/USAR Team must be trained to this level to operate safely in a cold zone.

2. **Operations Level:** This level represents the capacity of organisations to respond to technical search and rescue incidents and to identify hazards, use rescue equipment, and apply limited techniques specified in this standard to support and participate in technical search and rescue incidents. The transition zone (or warm zone) is the area between the exclusion and support zones. This area is where responders enter and exit the exclusion zone. All members of a technical rescue/USAR Team must be trained to this level to operate in a cold and/or warm zone. Appropriate protective clothing is required in this zone.

3. **Technician Level:** This level represents the capacity of organisations to respond to technical search and rescue, and/or USAR incidents and to identify hazards use rescue equipment, and apply advanced techniques specified in this standard necessary to coordinate, perform and supervise technical search and rescue incidents. The exclusion zone (or hot zone) is the area where tactical search and rescue operations are conducted. This zone poses the greatest hazard and risk of injury/death. All members of a technical rescue/USAR Team must be trained to this level to operate in a warm and/or hot zone. Appropriate protective clothing and equipment is required in this zone.

**Rope Rescue**

Rope techniques are a basic underlying skill for most other types of rescue. Most rescuers will be familiar with basic rope techniques and knot tying as part of their induction curriculum.

An awareness of rope skills can be taught to rescuers in only a day. It could include topics such as rope characteristics, strengths, basic knots, hardware, hazards to be aware of when using rope, and dangerous techniques to avoid. An operations level could cover rope rescue techniques. Rescuers could be taught basic techniques of rappelling, rigging, belaying, safety, anchoring, and simple mechanical advantage systems. Additional operational techniques could include patient packaging, low angle evacuations, and simple pick-off manoeuvres. This could be taught in two days.

A detailed technician level programme could be conducted in approximately one week, covering basic and advanced rigging techniques, anchor systems, belays, simple and complex mechanical advantage systems, and advanced patient extrication techniques and stokes basket operations. Low and high angle rescue techniques, including telpher and Tyrolean systems, could also be included.

The specialist level course could include advanced techniques for helicopter operations, ladder operations and bridging techniques, and other topics. It should require practical and teaching experience. Urban rope techniques could be incorporated for areas where high angle rescues may be adapted to an urban environment.

Sample course topics:

- Course objective.

- Rope rescue applications.
- Rescue philosophy.
- Safety.
- Types of rope.
- Types of equipment.
- Types of hardware and technical gear.
- Communications.
- Knots, hitches, and anchors.
- Lashing and picketing techniques.
- Simple and complex mechanical advantage systems.
- Belay techniques.
- Litter rigging and evacuation techniques.
- Low angle rescue.
- High angle rescue.
- Urban rescue operations.
- Traverse techniques.
- Incident command.
- Self-rescue techniques.
- EMS and patient care considerations.
- Helicopter operations.

Personal equipment:

- Helmet.
- Sturdy boots.
- Leather gloves (preferably not firefighting gloves).
- Harness.
- Clothing (appropriate for terrain and weather conditions).

**Confined Space Rescue**

Confined spaces are defined as any area not designed for human occupancy with limited entrance and egress. Many countries maintain national regulations which require confined space rescue personnel who enter permit spaces to be trained prior to attending this type event.

An awareness of confined space rescue can be taught in a few hours. The awareness level for confined space could include background on applicable regulations, recognition of permit-required spaces, confined space hazard recognition, how to secure the scene, available resources for confined space rescue, and what conditions preclude their entry into a space.

Operations level personnel could be taught safe entry and rescue techniques, atmospheric monitoring techniques, and how to size up the hazards and risks. An operations level could be achieved with several days of training.

Technician level personnel could be trained for a wide range of skills and hazard assessment.

Skills may include patient evacuation, special retrieval systems, use of communications and command at confined space incidents, familiarity with various types of confined space, atmospheric monitoring, hazard assessment, and ventilation techniques.

At least 40 hours would be necessary to train personnel to the technician level. The specialist should be fully versed in confined space operations and have hands on, practical experience. A specialist should have the expertise of the technician, along with experience in training, hazmat, and other associated rescue areas that would be applicable to confined spaces.

Sample course topics:

- Types of confined spaces.
- National regulations rules.
- Hazard recognition.
- Securing the scene.
- Resources.
- Atmospheric monitoring.
- Incident command.
- Rescuer entry techniques.
- Retrieval systems.
- Rope and hardware and technical equipment.
- Lock out/tag out procedures.
- Breathing apparatus equipment.
- EMS and patient care considerations.
- Safety and survival.

Personal equipment necessary:

- Helmet.
- Gloves.
- Work boots.
- Personal protective clothing.
- Harness.
- Knee pads/elbow pads.
- Eye protection.
- Self-contained breathing apparatus/supplied air breathing system.

**Trench Rescue**

By definition, a trench is deeper than it is wide. Rescuers have been killed and injured after entering an un-shored trench which suffered a secondary collapse. Awareness of the dangers of trench incidents can be taught in about two hours, covering the basics of hazard recognition, scene security, rescuer safety, types of trench collapses, additional resources, and initial actions.

An operations level of training can be taught in several days, with students gaining knowledge of rescue equipment, different types of shoring, means of securing the site according to the team's SOPs, how to perform a safe entry, and other support operations.

Technician level personnel could become familiar with various rescue techniques, shoring techniques, victim retrieval systems, EMS and patient care skills for trench collapse, control of utilities, and long-term operations skills. The technician level could be taught in about ten days.

A specialist could be thoroughly expert in the use of all types of rescue equipment and techniques for trench rescue incidents and should have practical and teaching experience.

Trench rescue shares equipment, rescue techniques, and skills with both confined space rescue and collapse rescue. A course could be designed to include aspects of each discipline.

Sample course topics:

- Trench hazards.
- Securing the scene.
- Safety.
- Incident command.
- Equipment and resources.
- SOPs.
- Shoring techniques.
- Rigging.
- EMS care.
- Entry and patient removal techniques.

Personal equipment:

- Helmet.
- Gloves.
- Work boots.
- Personal protective clothing.
- Harness.
- Knee pads/elbow pads.
- Eye protection.
- Self-contained breathing apparatus/supplied air breathing system.
- Folding shovel.

**Structural Collapse**

Structural collapse shares many techniques with trench and confined space rescue. An awareness of the dangers of structural collapse could cover types of construction and associated hazards, types of collapses, how to secure the scene, and when to call for help. This could be taught in approximately eight hours.

An operations level of training could also include patterns for conducting surface debris search for victims, basic stabilisation, utility control, and atmospheric monitoring. It could be taught in two to three days.

A technician level course covering shoring and building stabilisation, rescue equipment, search equipment and operations, tunnelling and excavation techniques, and patient care could be taught in approximately five days.

A specialist should be expert in the use of various types of Light and Heavy rescue technologies, hazard stabilisation and mitigation, and the components of USAR techniques.

Sample course topics:

- Size up and command considerations.
- Construction types.
- Types of collapses.
- Initial actions.

- Dangers to rescuers.
- Basic search techniques.
- Advanced search techniques.
- Shoring and stabilising techniques.
- Equipment and technologies for collapse rescue.
- EMS and patient considerations.
- Safety and psychological impact/critical incident stress debriefing.
- Breaching concrete and steel and other barriers.
- Tunnelling and excavation techniques.
- Hazards to rescuers.
- Heavy construction equipment operations.

Personal equipment:

- Helmet.
- Gloves.
- Work boots.
- Personal protective clothing.
- Harness.
- Knee pads/elbow pads.
- Eye protection.
- Self-contained breathing apparatus/supplied air breathing system.
- Folding shovel.

**Water Rescue**

One of the most dangerous types of special rescue is water rescue. There are several different specialties within the field of water rescue. Rescuers may face incidents involving calm water, swift water, ice, or even surf conditions. Dive rescue is a specialty within itself and is not discussed in this manual.

Courses in each training level could be designed to address all types of water rescue or individual types (e.g. swift water rescue only). A basic awareness of water hazards, safety, and shore-based rescue techniques can be taught in a few hours. Different types of water rescue may share similar techniques but pose different dangers.

Operations level training could cover techniques for in-water or ice rescue. Rescuers could become familiar with different types of water rescue techniques, ice and current hazards, hypothermia and EMS considerations, ice rescue equipment, and shore-based swift water rescue techniques. This course could be taught in about one week but would require personnel to be able to swim.

The technician level could require knowledge in all facets of water rescue and how to perform special rescue techniques such as victim retrieval using boats or a helicopter. This course too could be taught in about one week.

The specialist level could require in-depth knowledge of all types of water rescue techniques and hazards as well as practical and training experience.

Sample course topics:

- Water hazards.

- Ice characteristics and dangers.
- Swift water hazards and hydraulic characteristics.
- Reach techniques.
- Throw techniques.
- Row techniques.
- Go techniques.
- Helicopter uses.
- Cold water drowning and hypothermia.
- Self-rescue and survival techniques.
- Rescue vs. recovery.
- Search patterns and techniques.
- Safety.
- Incident command.
- Boat operations.
- Flash flood and rising water.
- Contaminated bodies of water.
- Ice rescue equipment and techniques.
- Swift water rescue equipment and techniques.
- Basic water safety.
- Swimming test.

Personal equipment:

- Personal floatation device/life vest.
- Whistle.
- Knife or shears.
- Flashlight.
- Rope throw-bag.
- Helmet.
- Gloves.
- Goggles/eye protection.
- Wet or dry suit.
- Suitable footwear.

## Annex C: INSARAG Minimum Operational Levels, Training Standards, Performance Criteria, and Equipment Used for USAR Teams

### General Requirements for USAR team members

1. Must be able to meet the fitness requirements of the USAR Team
2. Must be available on short notice to mobilise within ten hours of request and be personally self-sufficient for at least 72 hours for a response assignment of up to ten days in austere environments.
3. Must be capable of improvising and functioning for long hours under adverse conditions.
4. Must maintain current inoculations as described by WHO for international travel to the affected country.
5. Must be able to function safely at heights and on or around rubble.
6. Must understand and adhere to safe working practices and procedures as required in the urban disaster environment.
7. Must have first aid training.
8. Must understand the needs of and provide support to their counterparts within the INSARAG community for specific operations, techniques and application of tools and equipment.

| Operational Level | Training | Performance Criteria | Equipment |
|---|---|---|---|
| • **FIRST RESPONDER** Structural wood system or light metal components, unreinforced masonry, adobe or raw mud and bamboo, which in general provide support for floors, walls or roofing assembly. | • Hazardous Materials First Response.<br>• Medical First Response.<br>• Incident Command Systems.<br>• Basic USAR.<br>• Application of general INSARAG Guidelines and concepts. | • Establishing an Incident Command System and assuming command over one already established.<br>• Recognise the risk conditions presented by light-frame structures and potential consequences.<br>• Maintain and take action under international safety standards.<br>• Apply rescue techniques, including removal of existing light rubble in collapsed or failed light-frame structures.<br>• Apply load-lifting techniques using levers and cribbing for stabilisation.<br>• Provide basic emergency medical treatment, stabilise, immobilise and extricate patients.<br>• Know and apply the INSARAG Marking System.<br>• Apply basic procedures for hazmat incidents.<br>• Apply basic search techniques. | • Basic cutting tools.<br>• Basic breaking tools.<br>• Ropes of various thicknesses.<br>• Rope accessories.<br>• Assortment of levers.<br>• Cribbing supplies.<br>• Communications equipment for suitable for search and rescue and sufficient for the number of team members.<br>• Basic life-support equipment.<br>• Personal protective equipment.<br>• Whistles and/or horns for signalling.<br>• Marking supplies.<br>• ABC fire extinguishers. |

**I. Hazmat First Responder**

Training in:

- Hazmat incidents.
- Hazmat recognition.
- Use of the Emergency Response Guide (ERG).
- Safety and health.
- Initial control and incident management.

**II. Incident Command System (ICS)**

Training in:

- ICS principles and structure.
- Expansion and contraction of ICS structure.
- Facilities.
- Resources.
- Action plan.
- Activation, demobilisation and operational closure.

**III. Basic USAR**

Training in:

- Introduction to USAR.
- Risk assessment.
- Heavy lifting.
- Emergency shoring.
- Ropes and knots.
- Backboard securing and strapping.
- Ladder rescue procedures.
- Search (hailing method).
- INSARAG Marking System.

**IV. INSARAG Guidelines and principles**

Training in:

- Protocols.
- Guidelines.
- Procedures.
- UCC.

**Minimum Training Standards for Light, Medium and Heavy USAR Teams**

**MANAGEMENT**

***Team Leader/Deputy Team Leader***

Position Prerequisites:

- Occupy an existing senior management position in organisation.
- Understanding of INSARAG Methodology.
- Registered user of the Virtual On-Site Operations Coordination Centre (VOSOCC) and a functional understanding of its utilisation.
- Functional English.
- Cultural awareness.
- Completion of the online UN BSAFE security awareness course.

Roles and Responsibilities:

- Overall command of strategy, tactics and safety while operating within a USAR environment.
- Comprehensive knowledge of all USAR Team functions.
- Understanding of the UN cluster system and other disaster response organisations including NGOs.
- Knowledge of available technologies.
- Functional knowledge of hazards associated with disaster environments.
- Facilitate external coordination.
- Supervisory and personnel management techniques:
    - Communication.
    - Cooperation.
    - Coordination.
    - Human relations:
        - Negotiation skills.
        - Conflict resolution.
        - Critical incident debriefing.
        - Staff welfare.
- Diplomatic planning and problem-solving using a consensus approach.
- Financial responsibility.
- Strategic planning.
- Media interaction.

***Planning Officer***

Position Prerequisites:

- Occupy an existing senior management position in organisation.
- Understanding of INSARAG Methodology.
- Registered user of the VOSOCC and a functional understanding of its utilisation.
- Computer literacy.
- Functional English.

- Cultural awareness.
- Completion of the online UN BSAFE security awareness course.
- GIS applications including use of GPS.

Roles and Responsibilities:

- Understanding of USAR strategy, tactics and safety.
- Understanding of the UN Cluster System and other disaster response organisations, including NGOs.
- Practical application of available information technologies.
- Functional knowledge of hazards associated with disaster environments.
- Facilitate internal coordination.
- Personnel management techniques:
    - Communication.
    - Cooperation.
    - Coordination.
    - Human relations:
        - Negotiation skills.
        - Conflict resolution.
        - Critical incident debriefing.
        - Staff welfare.
- Diplomatic planning and problem-solving.
- Financial delegation.
- Operational Planning:
    - Collect data.
    - Collate data.
    - Analyse data.
    - Planning cycle:
        - Develop a visual Plan of Action, written or otherwise, in order to meet the objectives of the local Incident Commander.
        - Disseminate plan.
        - Monitor plan for effectiveness.
        - Implement revisions to the plan as required.
- Media awareness.
- Information management:
    - Functional written English.
    - Record keeping.
    - Report writing.
    - Preparation of a post mission planning report.

***Operations Officer***

Position Prerequisites:

- Occupy an existing senior management position in organisation.
- Understanding of INSARAG Methodology.
- Registered user of the VOSOCC and a functional understanding of its utilisation.

- Functional English.
- Cultural awareness.
- Completion of the online UN BSAFE security awareness course.
- Documented experience in USAR operations.

Roles and Responsibilities:

- Comprehensive knowledge of all USAR Team functions.
- Comprehensive knowledge USAR Cycle[1], operations, tactics and safety considerations.
- Understanding of the UN Cluster System and disaster response organisations including NGOs.
- Practical application of available technologies including mapping.
- Functional knowledge of hazards associated with disaster environments.
- Facilitate both internal and external coordination.
- Personnel management techniques:
    - Communicate.
    - Cooperate.
    - Coordinate.
    - Human relations:
        - Negotiation skills.
        - Conflict resolution.
        - Critical incident debriefing.
        - Staff welfare including crew rest and rehabilitation.
- Tactical problem-solving:
    - Operational control of assigned area.
    - Interacts with local rescue resources, the LEMA and other organisations.
    - Controls crew accountability system.
    - Implements risk mitigation strategies.
    - Knowledge of tools and equipment.
    - Coordinates assigned resources to accomplish assigned tasks.
- Implements tactical aspects of a Plan of Action:
    - Collect data.
    - Reports progress or gaps pertaining to the tactical Plan of Action as required.
    - Implements revision to the tactical Plan of Action.
- Media awareness.
- Information management:
    - Record keeping.
    - Report writing.
    - Preparation of a post mission operations report.

***Structural Engineer***

Position Prerequisites:

- Academic degree in civil/construction engineering (see description at end for this document) and training in rescue engineering.

[1] Please refer to Manual B: Operations for a description of the USAR cycle.

- Cultural awareness.

Roles and Responsibilities:

- Understanding of all disciplines and capabilities within the USAR Team.
- Understanding of INSARAG Methodology.
- Understanding of USAR operations, tactics and safety considerations.
- Gather information on affected area structural profiles.
- Practical application of available technologies.
- Functional knowledge of hazards associated with disaster environments.
- Personnel management techniques:
    - Communicate.
    - Cooperate.
    - Coordinate.
- Tactical problem-solving.
- Operational responsibilities:
    - Conduct structural assessments.
    - Identify structural types.
    - Identify specific structural hazards.
    - Building marking.
- Practical solutions for tactical problems pertaining to structural instability:
    - Is structure safe?
    - If no, can structure be made safe and if so how?
    - Design and supervise implementation of structural shoring.
    - Design and supervise implementation of structural de-layering.
    - Coordination with USAR Team Riggers and Operations Chief and/or local Incident Commander.
- Information management:
    - Preparation of a post mission engineering report.

***Liaison Officer***

Position Prerequisites:

- Occupy an existing management position in a home organisation.
- Experienced as a liaison officer in a home organisation.
- Understanding of the UN Cluster System and other disaster response organisations including NGOs.
- Completion of the online UN BSAFE security awareness course.
- Comprehensive knowledge of INSARAG Methodology:
    - Functionality of a RDC and UCC.
- Registered user of the VOSOCC and a functional understanding of its utilisation.
- Functional English.
- Cultural awareness.
- Computer literacy.

Roles and Responsibilities **as USAR Team Liaison:**

- Comprehensive knowledge of all USAR Team functions.
- USAR operations, tactics and safety considerations.
- Comprehensive knowledge of other disaster response organisations.
- Practical application of available technologies.
- Functional knowledge of hazards associated with disaster environments.
- Participate joint operations planning.
- Media interaction.
- Information management:
    - Record keeping.
    - Report writing.

Roles and Responsibilities **if seconded to a United Nations Disaster Assessment and Coordination Team (UNDAC)**:

- Functional knowledge of UNDAC methodology.
- Comprehensive knowledge of all USAR Team functions.
- USAR operations, tactics and safety considerations.
- Practical application of available technologies.
- Functional knowledge of hazards associated with disaster environments.
- Diplomatic planning and problem-solving.
- Control joint operations planning:
    - Collect data.
    - Collate data.
    - Analyse data.
    - Planning cycle:
        - Develop Plan of Action.
        - Disseminate plan.
        - Coordinates assignment of resources to accomplish LEMA objectives.
        - Monitor plan for effectiveness.
- Implement revisions to the plan as required.
- Interacts with local rescue resources, LEMA and other organisations.
- Media interaction.
- Information management:
    - Record keeping.
    - Report writing.
    - GPS awareness.

***Safety Officer***

Position Prerequisites:

- Occupy an existing management position in home organisation.
- Experienced as a safety officer in a home organisation, with a relevant certificate of qualification in home country.
- Completion of the online UN BSAFE security awareness course.
- Functional English.
- Cultural awareness.

Roles and Responsibilities:

- Comprehensive knowledge of all USAR Team functions.
- USAR operations, tactics and safety considerations.
- Functional knowledge of hazards associated with disaster environments.
- Internal coordination with:
    - USAR Team Leader and Deputy Team Leader.
    - Medical Manager.
    - Hazmat Technician.
- Personnel management techniques:
    - Communicate.
    - Cooperate.
    - Coordinate.
    - Human Relations:
        - Negotiation skills.
        - Conflict resolution.
        - Critical incident debriefing.
        - Staff welfare:
            - Rest and rehabilitation planning.
            - Rotating roster.
            - Fatigue management.
            - Sanitation and hygiene.
- Safety control of assigned area:
    - Evaluation of all roles to assure that optimal safety and injury prevention is being practiced at all times.
    - Immediate intervention in activities to prevent the loss of life and/or injury.
    - Documentation of safety and risk assessment.
    - Implements risk mitigation strategies.
    - Controls crew accountability system.
    - Knowledge of tools and equipment.
- Develop and implement safety aspects of Plan of Action:
    - Analyse data relative to safety considerations.
    - Continuously monitor the hazard and risk environment.
- Information management:
    - Record keeping.
    - Report writing.
    - Preparation of a post mission safety report.

## LOGISTICS

### *Logistics Manager and Logistics Technician*

(Those in **bold** are applicable only to the Logistics Manager).

Position Prerequisites:

- **Occupy an existing logistics management position in home organisation.**

- Must possess all certifications and fulfil all requirements of a Logistics Technician within home organisation.
- **Serve at home in a logistics management position.**
- **Understanding of INSARAG Methodology.**
- **Registered user of the VOSOCC.**
- **Computer literacy.**
- **Functional written English.**
- Completion of the online UN BSAFE security awareness course.

Roles and Responsibilities:

- Comprehensive knowledge of all USAR Team functions.
- USAR operations, tactics and safety considerations.
- Practical application of available technologies.
- Functional knowledge of hazards associated with disaster environments.
- Internal coordination of functional area:
    - Ensure accountability, maintenance and repairs for tools and equipment.
    - Provide for welfare, operations and the maintenance for assigned resources in the BoO.
    - Coordinate transport for team and equipment.
- **Financial delegation.**
- Operational planning pertaining to logistics:
    - **Control of the BoO and the tool and equipment cache.**
    - Supply/re-supply.
    - Airport logistics with regards to cargo handling.
    - Transportation of equipment and personnel to incident site.
    - Access to petroleum product and compressed gases and timber.
    - Completion of equipment manifest and declaration of hazardous goods.
- Information management:
    - Record keeping.
    - Report writing.
    - Preparation of a post mission logistics report.

***Communications/IT Specialist***

Position Prerequisites:

- Occupy an existing communications/IT position in home organisation.
- Functional experience with communications/IT equipment.
- Understanding of INSARAG Methodology.
- Registered user of the VOSOCC.
- Computer literacy.
- Functional English.
- Completion of the online UN BSAFE security awareness course.

Roles and Responsibilities:

- Understanding of all team functions.

- Ensure communication:
  - Within the team.
  - With other participants within the affected country.
  - Internationally – i.e. from affected country to home country.
  - To access internet in the field.
- Install, operate and maintain:
  - Communications and IT equipment.
  - UHF/VHF radio.
  - Geospatial technologies.
- USAR safety considerations.
- Practical application of available technologies.
- Functional knowledge of hazards associated with disaster environments.
- Information management:
  - Record keeping.
  - Report writing.

**RESCUE**

***Rescue Team Officer/Rescue Technician***

(Those in **bold** are applicable only to the Rescue Team Officer).

Position Prerequisites:

- **Occupy an existing operational management position in home organisation.**
- **Serve at home in an operational management position.**
- Must possess all certifications and fulfil all requirements of a Rescue Technician within home organisation.
- **Understanding of INSARAG Methodology.**
- Completion of the online UN BSAFE security awareness course.

Roles and Responsibilities:

- Comprehensive knowledge of all team functions.
- USAR operations, tactics and safety considerations.
- Functional knowledge of hazards associated with disaster environments.
- Internal coordination.
- **External cooperation and cultural awareness.**
- Personnel management techniques:
  - Communicate – strong interpersonal skills.
  - Cooperate.
  - Coordinate.
  - Human relations:
    - Negotiation skills.
    - Conflict resolution.
    - Critical Incident debriefing.
    - Staff welfare/including rest and rehabilitation cycles.
- Tactical Operations:

- Tactical problem-solving.
- **Operational control of assigned area.**
- Implement tactical component of the Plan of Action.
- Determine organisational and logistical needs for the worksite.
- Interacts with locals, LEMA and other organisations.
- **Controls crew accountability system.**
- **Ensure team's welfare and safety standards are enforced.**
- Determine most appropriate tactical approach.
- Knowledge of tools and equipment.
- Direct resources to accomplish assigned tasks.
- **Maintain communication with Operations Officer.**
- Recommends revision to the tactical Plan of Action based on progress or gaps.

- Information management:
  - Record keeping.
  - Report writing.
  - Input into post-mission operations report.

***Hazmat Technician***

Position Prerequisites:

- Must possess all certifications and fulfil all requirements of a Hazmat Technician within home organisation.
- Understanding of INSARAG Methodology.

Roles and Responsibilities:

- Comprehensive knowledge of all team functions.
- USAR operations, tactics and safety considerations.
- Functional knowledge of hazards associated with disaster environments.
- Internal coordination with:
  - Medical Manager.
  - Safety Officer.
- Personnel management techniques:
  - Communicate – strong interpersonal.
  - Cooperate.
  - Coordinate.
  - Human relations:
    - Negotiation skills.
    - Conflict resolution.
    - Critical incident debriefing.
    - Staff welfare.
- Tactical Operations:
  - Gross and technical decontamination in any environment required.
  - Responsible for the monitoring of flammable, toxic and asphyxiating levels in the atmosphere.
  - Monitor and report on current and expected weather conditions.

    - Responsible for the repairs and maintenance of any technical equipment relating to hazmat detection.
    - Tactical problem-solving.
    - Implement tactical component of the Plan of Action.
    - Determine organisational and logistical needs for the worksite.
    - Interacts and advises locals, LEMA and other organisations.
    - Provide input to ensure team's welfare and safety standards are enforced.
    - Determine most appropriate tactical approach.
    - Knowledge of tools and equipment.
    - Direct resources to accomplish assigned tasks.
    - Maintain communication with Rescue Team Leader.
    - Recommends revision to the tactical Plan of Action based on progress or gaps.
- Information management:
    - Record keeping.
    - Report writing.
    - Input into post mission operations report.

***Rigging Specialist***

Position Prerequisites:

- Knowledge of the operational characteristics and capability of heavy construction equipment.
- Understanding of the methods of construction and the demolition of structures.

Roles and Responsibilities:

- Understanding of all disciplines and capabilities within the USAR Team.
- Understanding of USAR operations, tactics and safety considerations.
- Practical application of available technologies.
- Functional knowledge of hazards associated with disaster environments.
- Personnel skill set:
    - Communications.
    - Cooperation.
    - Coordination.
- Operational responsibilities:
    - Knowledge of heavy rigging operations – i.e.:
        - Lifting capacity.
        - Lifting engineering application.
        - Use of anchor systems.
        - Application of shoring methods and materials.
    - Universal hand signals for operations of heavy equipment.
    - Practical solutions for tactical problems pertaining to rigging and lifting.
    - Coordination with engineers.

**SEARCH**

***Technical Search/Search Dog Handler***

Position Prerequisites:

- Must possess all certifications and fulfil all requirements of a Technical Search Technician or Dog Handler within home organisation.
- Understanding of INSARAG Methodology.
- Cultural awareness.
- Completion of the online UN BSAFE security awareness course.

Roles and Responsibilities:

- Comprehensive knowledge of all team functions.
- USAR operations, tactics and safety considerations.
- Functional knowledge of hazards associated with disaster environments.
- Internal coordination.
- External cooperation.
- Personnel management techniques:
    - Communicate – strong interpersonal skills.
    - Cooperate.
    - Coordinate.
    - Human relations:
        - Negotiation skills.
        - Conflict resolution.
        - Critical incident debriefing.
        - Staff welfare.
- Tactical Operations:
    - Tactical problem-solving.
    - Implement tactical component of the Plan of Action.
    - Determine organisational and logistical needs for the worksite.
    - Interacts with locals, LEMA and other organisations.
    - Provide input to ensure team's welfare and safety standards are enforced.
    - Determine most appropriate tactical approach:
        - Application of search theory and tactics.
        - Develop a mapping and grid system.
        - Initiate victim detection phase using search dogs.
        - Initiate victim location phase using cameras and listening devices.
    - Knowledge and maintenance of tools (includes search dogs) and equipment.
    - Direct resources to accomplish assigned tasks.
    - Maintain communication with designated officer.
    - Recommends revision to the tactical Plan of Action based on progress or gaps.
- Information management:
    - Record keeping.
    - Report writing.
    - Input into post mission operations report.

**MEDICAL**

Position requirements:

- For medical team members intending to practice medicine:
  - Must possess the required academic qualifications to be licensed and registered to practice as a doctor, nurse or paramedic within their home organisations.
  - Scope of practice should be defined by licensure in home country.
- Understanding of INSARAG Methodology.
- Understanding of all disciplines and capabilities within USAR Team (operations, tactics, and safety considerations).

Roles and Responsibilities:

The primary response objectives of the medical component of a USAR Team are to:

- Provide critical medical input into the decision-making processes of USAR Team leaders throughout the mission cycle.
- Provide health monitoring, primary care and emergency medical care for USAR Team members during mobilisation, operations, demobilisation (see following chart for definitions).
- Provide emergency veterinary care for the USAR Team search dogs in collaboration with their handlers during mobilisation, operations, demobilisation.
- With approval of the government of the affected country, provide emergency medical care to victims, including within confined space, during the rescue phase until handover to local health resources or similar agency.
- Provide medical input to the USAR Team management regarding safety and health considerations including environmental and public health hazards as well as care of deceased.
- Gather medical information during USAR reconnaissance operations.
- Establish and regularly review emergency medical evacuation and repatriation plans for USAR Team members.
- Provide medical input and or support to the USAR Team Leader that will facilitate the transition from the rescue phase to the early recovery phase.
- Information management:
  - Record keeping.
  - Report writing.
  - Input into post mission operations report.

**USAR Teams seeking INSARAG External Classification must be classified in their home country at either of these three levels**

**CLASSIFIED TEAMS OPERATIONAL LEVELS**

**Light**

The Light team will be supported by the National Policy Focal Point as a deployable resource from the donor/country and will be supported by appropriate funding arrangements to support on-going operations in the International environment.

Light IEC teams may be developed from the existing National capacity and capability base, where one exists, or may be from NGO's with support from the National Policy Focal Point. The team will be able to provide the five components of USAR within the team (Management, Search, Rescue, Logistics & Medical),

The team will be self-sufficient on a single worksite for 12-hour days (with a work-rest cycle of 12 hours rest), over a 5-day period, and equipped to conduct technical and/or canine search, and rescue operations in collapsed structures of wood, masonry, and light reinforced concrete construction. The team will also have capacity for independent transport into and out of the country. The Light IEC team will be capable of conducting ASR3 operations on the allocated worksite and will integrate into the standard INSARAG reporting mechanisms. The team will generally consist of between 17 and 20 personnel and will have the ability to support the RDC or UCC with one person for the duration of the deployment.

Light teams may combine multiple team positions for efficient use of limited resources.

The technical abilities of a Classified Light Team must include all components of a Medium or Heavy Classified team with the following exceptions:

| Description | Classified Heavy USAR Team | Classified Medium USAR Team | Classified Light USAR Team |
|---|---|---|---|
| ASR level capability | | | ASR 1, 2 &3. |
| Search capability | | | Technical AND/OR Canine |
| Concrete walls and floors | | | Mesh reinforced – up to 150 mm |
| Concrete columns and beams | | | Not applicable |
| Structural steel | | | 3 mm |
| Reinforcing bars (Rebar) | | | Non-structural mesh reinforcing |
| Timber | | | 200 mm |
| Rigging and lifting (Manual & levers) | | | 1 Tonne |

| | | | |
|---|---|---|---|
| Rigging and lifting (Mechanical, Hydraulic or Pneumatic) | | | 1 Tonne |
| Crane operations (Slings) | | | 5 Tonnes |
| Safe work at heights and rope rescue | | | Rescue a casualty from 10 metres above or below the work site |
| Shoring | | | Windows and doors |
| Hazmat detection | | | Radiation, Air Monitoring (O2, CO, H2S, Flam) Ph/Alkalinity |

**Medium**

This resource must be recognised by its national government as a domestic response resource used daily in some form for mitigation of local events. It must also have support of its national government to engage in international humanitarian relief activities, especially regarding USAR. The Medium level requires conducting search and rescue operations in collapsed or failed structures built of heavy wood, reinforced masonry construction, lightweight steel, wood frame and other lightweight construction styles. A Medium USAR Team is expected to have either a canine search function or technical search function (preferably both); a Heavy USAR Team is required to have both.

**Heavy**

In addition to the capabilities and capacities of the Medium Operational Level, this level also requires the capability to conduct search and rescue operations (in two separate locations) in collapsed or failed structures of reinforced concrete or steel-frame construction. While a Medium USAR Team is expected to have either a canine search function or technical search function (preferably both); a Heavy USAR Team is required to have both.

| Position | Training | Performance Criteria | Equipment |
|---|---|---|---|
| **Team Leader and**<br>**Deputy Team Leader** | **Light, Medium and Heavy**<br>• USAR methodology at national level.<br>• Understanding of INSARAG methodology including OSOCC methodology.<br>• Ability to implement and follow recognised incident command protocols. This | **Light, Medium and Heavy**<br>• Manage all aspects of team operations and assures that all functional areas. coordinate operations.<br>• Ensure commitments to human rights, gender balance, legal, moral and cultural issues are demonstrated. | **Light, Medium and Heavy**<br>• Administrative tools and supplies required to manage the USAR. Team at the level of classification.<br>• Personal protective equipment. |

| Position | Training | Performance Criteria | Equipment |
|---|---|---|---|
| | includes, but not limited to, span of control, risk management, assignments by function, effective communication and welfare of response personnel.<br>• Mobilisation, activation, demobilisation and integration of international resources into operations.<br>• Understanding of culture, ethnicity and gender.<br>• Collapsed structure search and rescue.<br>• USAR Capacity Building for Local Community Response. | | |
| **Safety and Security Officer** | **Light, Medium and Heavy**<br>• Occupational health and safety.<br>• Field hygiene procedures.<br>• Risk assessment procedures.<br>• Situation, risk and needs assessments.<br>• Rehabilitation and crew rotation. | **Light, Medium and Heavy**<br>• Provide safety and security planning throughout the deployment.<br>• Recognise the risks associated with construction types encountered and potential consequences from specific collapse patterns. | **Light, Medium and Heavy**<br>• Administrative tools and supplies required to provide safety and security for the USAR Team at the level of classification.<br>• Personal protective equipment. |
| **Liaison Officer** | **Heavy**<br>• Liaison function as referenced in the INSARAG Guidelines.<br>• Development of a Plan of Action. | **Heavy**<br>• Provide assistance to the OSOCC to ensure that coordination and communication occurs between it and the USAR Team. | **Heavy**<br>• Capacity to host an OSOCC or supply staff for a RDC. |

| Position | Training | Performance Criteria | Equipment |
|---|---|---|---|
| | | • Augment staffing in a RDC.<br>• Host an OSOCC. | |
| **Media Officer** | **Light, Medium and Heavy**<br>• Media relations. | **Light, Medium and Heavy**<br>• Provide assistance to the media to ensure that information releases are accurate and coordinated by the LEMA through the OSOCC. | **Light, Medium and Heavy**<br>• Administrative tools and supplies required to interact with the media for the USAR Team at the level of classification. |
| **Planning Officer** | **Light, Medium and Heavy**<br>• Meeting organisation and facilitation.<br>• Planning required for USAR operations. | **Light, Medium and Heavy**<br>• Facilitate meetings, documentation of events and development of short- and long-range plans of action.<br>• Coordination with local Incident Commander, Operations and OSOCC. | **Light, Medium and Heavy**<br>• Office and administrative equipment for the USAR Team. |
| **Logistics Team Manager** | **Light, Medium and Heavy**<br>• Accountability, maintenance and repairs for tools and equipment.<br>• Welfare, operations and the maintenance for assigned resources in the BoO.<br>• Transport for team and equipment<br>• Management of the BoO and the tool and equipment cache.<br>• Supply/re-supply.<br>• Airport logistics with regards to cargo handling.<br>• Transportation of equipment and | **Light, Medium and Heavy**<br>• Arrange for air-transport of the USAR Team (personnel and equipment) including International Air Transport Association policy and procedure for Shippers Declaration of Dangerous Goods.<br>• Arrange for ground-transport of the USAR Team (personnel and equipment) from the arrival location to the assigned area of operations.<br>• Establish a BoO. | **Light, Medium and Heavy**<br>• Administrative tools and supplies required to manage logistics for the USAR Team at the level of classification.<br>• Supplies required to meet the administrative requirement of air and/or ground transport.<br>• Equipment and accessories for generating, supplying and detecting electricity.<br>• Equipment to establish a BoO including shelter, sanitation, tool repair, feeding and hygiene.<br>• Fire extinguishers. |

| Position | Training | Performance Criteria | Equipment |
|---|---|---|---|
| | personnel to incident site.<br>• Completion of equipment manifest and declaration of hazardous goods. | | |
| **Communications Specialist** | **Light, Medium and Heavy**<br>• Installation, operation and maintenance of communications and IT equipment and UHF/VHF radio systems<br>• Geospatial technologies. | **Light, Medium and Heavy**<br>• Ensure communications equipment is operational in accordance with the INSARAG Guidelines. | **Light, Medium and Heavy**<br>• Communications equipment including hand-held radios, satellite telephones, computers, facsimile machines and internet connectivity for the USAR Team at the level of classification. |
| **Structural Engineer** | **Light, Medium or Heavy**<br>• Identifying structure types, assessing structural damages and hazards.<br>• Designing, inspecting and supervising construction of structural shores.<br>• Structural monitoring. | **Light, Medium or Heavy**<br>• Recognise the risks associated with this type of construction and potential consequences.<br>• Identify construction materials and triage collapse patterns (related to void formation). | **Light. Medium or Heavy**<br>• Tools, supplies and equipment required to monitor building stability and design shoring systems. |
| **Rigging Specialist** | **Light, Medium and Heavy**<br>• Assessing the capacity and need of various construction-related equipment.<br>• Various rigging techniques, including the development of rigging plans and procedures.<br>• Interacting with and coordinating efforts between USAR Team personnel and local heavy equipment/crane operators. | **Light**<br>• Stabilise Building components<br>• Apply lifting techniques for loads up to 1 tonne (manual) and 5 tonnes (mechanical).<br>**Medium**<br>• Stabilise building components<br>• Apply lifting techniques for loads up to one metric tonne (manual) and 12 metric tonnes (mechanical). | **Light**<br>• Hydraulic, pneumatic and mechanical equipment for lifting loads up to 1 metric tonne (manual) and 1 metric tonnes (mechanical), and 5 Tonnes with slings and cranes.<br>• Work safe at heights and rope rescue a patient from 10 metres above or below the work site. |

| Position | Training | Performance Criteria | Equipment |
|---|---|---|---|
| | • Safe manual lifting techniques. | **Heavy**<br>• Apply lifting techniques for loads up to 2.5 metric tonnes (manual) and 20 metric tonnes (mechanical). | • Assortment of bars/levers for lifting light objects.<br>• Cribbing supplies.<br>**Medium**<br>• Hydraulic, pneumatic and mechanical equipment for lifting loads up to 1 metric tonne (manual) and 12 metric tonnes (mechanical).<br>• Equipment for lifting and lowering loads with accessories for anchoring, securing, moving and dragging loads up to 12 metric tonnes.<br>• Rope for hauling and anchoring, with accessories.<br>• Assortment of bars/levers for lifting light objects.<br>• Cribbing supplies.<br>**Heavy**<br>• Hydraulic, pneumatic and mechanical equipment for lifting loads up to 2.5 metric tonnes (manual) and 20 metric tons (mechanical).<br>• Equipment for lifting and lowering loads with accessories for anchoring, securing, moving and dragging loads greater than 20 metric tonnes. |
| **Search Officer** | **Light, Medium and Heavy** | **Light and Medium** | **Light, Medium and Heavy** |

| Position | Training | Performance Criteria | Equipment |
|---|---|---|---|
| | • Management of search operations including application of grid systems, mapping and land navigation.<br>• Search (hailing and physical).<br>• INSARAG marking and signalling systems. | • Management of a coordinated search theory utilising *either* technical *or* canine search and rescue resources.<br>**Heavy**<br>• Management of a coordinated search theory utilising both electronic and canine search and rescue resources. | • Administrative tools and supplies required to manage search operations for the USAR Team at the level of classification.<br>• Signalling devices.<br>• Building marking supplies. |
| **Technical Search Specialist** | **Light, Medium and Heavy**<br>• Basic principles and theories of electronic search.<br>• Victim detection techniques.<br>• Operation of selected technical electronic listening and optical search equipment.<br>• Coordinating multiple search operations. | **Light, Medium and Heavy**<br>• Management equipment to achieve a high state of deployment readiness.<br>• Compliment rescue operations and be effective in the field. | **Light, Medium and Heavy**<br>• Technical equipment used to detect and/or locate victims including specialised cameras and acoustic/seismic devices. |
| **Canine Search Specialist/Dog Handler** | **Light, Medium and Heavy**<br>• Canine search operations including check/recheck procedures and observer responsibilities.<br>• Search pattern selection criteria including terrain; structures; and wind, weather and air circulation characteristics.<br>• Awareness of the hazards to the canine associated with various disaster environments. | **Light, Medium and Heavy**<br>• Maintain a high state of readiness for staff and canines.<br>• Compliment and integrate with the search component within operations. | **Light, Medium and Heavy**<br>• Search canines trained in air-scenting to detect entrapped victims. |

| Position | Training | Performance Criteria | Equipment |
|---|---|---|---|
| | • Providing canine first aid. | | |
| **Rescue Officer** | **Light, Medium and Heavy**<br>• Operate within the incident command framework and the ability to operate independently (without direct supervision) while ensuring personnel safety.<br>• Managing operations in the collapsed structure environment including.<br>  ○ Rescue strategies and techniques.<br>  ○ Shoring techniques to ensure operational safety working within buildings of lightweight steel, heavy timber or reinforced masonry construction.<br>  ○ Structures, materials and damage types.<br>  ○ Structural triage.<br>  ○ Application of equipment, tools and accessories.<br>  ○ Lifting and stabilising loads.<br>• Victim detection, location and extrication techniques.<br>• Technical skill sets used in the urban environment including | **Light, Medium and Heavy**<br>• Conduct search and rescue techniques including victim extrication.<br>• Identification of specific collapse pattern in various building construction types (related to void formation).<br>• Recognition and use of the INSARAG Building Marking System.<br>• **Light**: Shoring of a window or door only. | **Light, Medium and Heavy**<br>• Tools, supplies and equipment required to provide management at the identified classification level. |

| Position | Training | Performance Criteria | Equipment |
|---|---|---|---|
| | debris removal, light lifting and cutting, improvised cribbing, ropes and knots and ladder rescue procedures. | | |
| **Rescue Technician** | **Medium and Heavy**<br>• Operations in the collapsed structure environment.<br>  ○ Rescue strategies and techniques.<br>  ○ Shoring techniques for vertical, doors and windows.<br>  ○ Structures, materials and damage types.<br>  ○ Structural triage.<br>  ○ Application of equipment, tools and accessories.<br>  ○ Lifting and stabilising loads.<br>• Victim extrication Techniques. | **Light**<br>• Assemble Door and Window shoring systems.<br>• Cut and penetrate mesh reinforced concrete up to 150 mm thick, and timber up to 200 mm thick.<br>• Break, breach, lift and remove building components.<br>**Medium**<br>• Break, breach, lift and remove building components.<br>• Assemble vertical and window/door shoring systems.<br>• Cut and/or penetrate concrete up to 300 mm thick and timber up to 300 mm.<br>• Stabilise building components.<br>**Heavy**<br>• Cut and/or penetrate concrete up to 450 mm thick and timber up to 300 mm.<br>• Cut and/or burn metal, structural steel or steel bar up to 20 mm. | **Light**<br>• Equipment to cut metal debris up to 3 mm and light concrete reinforcing mesh.<br>• Hydraulic, Pneumatic or mechanical equipment for breaking concrete up to 150 mm and cutting timber up to 200 mm.<br>• Equipment for shoring windows and doors.<br>**Medium**<br>• Hydraulic, pneumatic and mechanical equipment for cutting metal debris up to 10 mm.<br>• Hydraulic, pneumatic and mechanical equipment for breaking concrete up to 300 mm thick and timber up to 300 mm.<br>• Equipment for assembling vertical and window/door shoring systems.<br>**Heavy**<br>• Hydraulic, pneumatic and mechanical equipment for cutting and burning metal, structural steel or steel bar up to 20 mm.<br>• Hydraulic, pneumatic and mechanical equipment to cut and/or penetrate concrete up to |

| Position | Training | Performance Criteria | Equipment |
|---|---|---|---|
| | | | 450 mm thick and timber up to 300 mm.<br>• Equipment for assembling raker and other required shoring systems such as box, sloped and custom shoring. |
| **Medical Team Manager** | **Light, Medium or Heavy**<br>• Must possess the necessary training to manage medical personnel, to integrate into team management structure, and to evaluate and integrate with local impacted healthcare infrastructure. | **Light, Medium or Heavy**<br>• Management of all medical team activities and provision of appropriate input into USAR Team Leadership. | **Light, Medium or Heavy**<br>• Administrative tools (e.g. checklists) and communications devices to provide oversight of Medical Team. |
| **NOTE:** In some instances, Medical Team Managers may also participate in patient care as outlined below. | | | |
| **Medical Specialist/**<br>**Doctor/**<br>**Paramedic/**<br>**Nurse** | • Light, Medium or Heavy.<br>• Basic first aid including haemorrhage control, splinting and cardio-pulmonary resuscitation.<br>• Treatment for shock.<br>• Infectious disease precautions.<br>• Burns and environmental emergencies.<br>• Moving and lifting patients.<br>• Medical triage.<br>• Oxygen administration (mask, cannula) and bag/mask ventilation. | **Light, Medium or Heavy**<br>• Performance of skill set in collapsed structure environment. | **Light, Medium or Heavy**<br>• Medical primary care and life support equipment (durables and non-durables) to care for the team including its dogs.<br>• Medical life support equipment to care for patients rescued, including stabilisation and packaging. |

| Position | Training | Performance Criteria | Equipment |
|---|---|---|---|
| | • Sedation and pain management.<br>• Casualty assessment, treatment and evacuation prioritisation.<br>• Management of tension pneumothorax.<br>• Wound care.<br>• Immobilisation and packaging.<br>• Procedures for care of deceased team members.<br>• Procedures for care of deceased local population (advised by local authorities).<br>• Water and sanitation; vector control.<br>• Environmental health (e.g. extreme temperature conditions).<br>• Hazmat exposure.<br>• Medium and Heavy.<br>• Primary care for team: Preventive medicine, medical monitoring and treatment as required.<br>• Emergency care (adult and paediatric).<br>• Casualty assessment, treatment, and evacuation prioritisation.<br>• Management of medical emergencies.<br>• Management of trauma emergencies to include: | | |

| Position | Training | Performance Criteria | Equipment |
|---|---|---|---|
| | Management of tension pneumothorax or wound care; immobilisation and packaging.<br>• Advanced airway management Advanced cardiac resuscitation Management of shock.<br>• Sedation and pain management.<br>• Management of crush syndrome Amputations and dismemberment (see note).<br>• Mental / Behavioural Healthcare.<br>• Identify and manage abnormal stress reactions in team members.<br>• Search Dog Emergency Care.<br>• Emergency veterinary care for the USAR tam search dogs in collaboration with their handlers.<br>• Health and hygiene.<br>• Water and sanitation; vector control.<br>• Environmental health.<br>• Hazmat exposures.<br>• Care of the decease.<br>• Procedures for care of deceased – team members; victims encountered in rubble. | | |

| Position | Training | Performance Criteria | Equipment |
|---|---|---|---|
| **NOTE:** Amputations and dismemberment<br><br>Amputations (live victims) and dismemberment (deceased) have always generated much discussion in the USAR community and is a complex issue with social, religious and ethical aspects to be considered. Though there may be extremely rare situations in which these two procedures are indicated as a last resort, the better course of action is to avoid these, if possible. There are multiple considerations:<br><br>• Amputations<br>• There are multiple limb salvage score criteria in use around the world. These are intended for use in the controlled environment of the operating theatre with full access to the victim and even these are often questioned when applied. It is unrealistic to expect the USAR medical provider to make a determination as to whether a limb is salvageable or not.<br>• Amputation should be considered a procedure of absolute last resort when:<br>  ○ Hazards present an immediate threat to life of the victim or the USAR Team members.<br>  ○ Amputation is considered to present a better chance survival than resuscitation while entrapped in the collapsed structure.<br>• Other factors to consider in the decision before conducting an amputation include:<br>  ○ Each team is encouraged to have a decision-making process which ideally includes the USAR Team Leader.<br>  ○ Level of care available post-extrication.<br>  ○ Discussion with patient (if possible).<br>  ○ Discussion with the LEMA (if possible).<br>  ○ Local cultural, religious considerations.<br>  ○ USAR medical teams should carry minimal equipment and supplies for conducting a field amputation or completion of an amputation.<br>• Dismemberment<br>  ○ There are even fewer situations in which dismemberment of the deceased is acceptable to permit USAR operations to continue. If this is to occur, it should usually be in the context of saving a live victim. Ideally, this procedure should not be performed by foreign USAR medical teams and instead by local medical teams, in conjunction with relevant forensic authorities. | | | |
| **Hazardous Material Specialist** | **Light & Medium**<br>• Household chemical identification, isolation and gross decontamination.<br>• Use of the local emergency response guide for hazmat.<br>**Heavy**<br>• Recognition, identification and documentation of basic risks and hazards at the rescue site and BoO.<br>• Identification of hazmat and application of | **Light & Medium**<br>• Operate atmospheric monitoring equipment.<br>**Medium & Heavy**<br>• Operate forced ventilation equipment. | **Light, Medium & Heavy**<br>• Atmospheric monitoring equipment<br>**Medium & Heavy**<br>• Forced ventilation equipment.<br>**Heavy**<br>• Air masks with complete face-piece and organic gas cartridges. |

| Position | Training | Performance Criteria | Equipment |
|---|---|---|---|
| | monitoring equipment.<br>• Recognition and use of USAR Team personal protective equipment.<br>• Gross and technical decontamination procedures and systems.<br>• Four-gas monitoring device to monitor oxygen, carbon monoxide, carbon dioxide and lower explosive limits.<br>• Application of forced ventilation equipment. | | |

**Description of Structural Engineer**

In most countries, a bachelor's degree in engineering represents the first step towards professional certification and the degree programme itself is certified by a professional body. After completing a certified degree programme the engineer must satisfy a range of requirements (including work experience and exam requirements) before being certified. Once certified, the engineer is designated the title of Professional Engineer (in the United States, Canada and South Africa), Chartered Engineer (in most Commonwealth countries), Chartered Professional Engineer (in Australia and New Zealand), or European Engineer (in much of the European Union). There are international engineering agreements between relevant professional bodies which are designed to allow engineers to practice across international borders.

The advantages of certification vary depending upon location. For example, in the United States and Canada only a licensed engineer may prepare, sign and seal, and submit engineering plans and drawings to a public authority for approval, or seal engineering work for public and private clients. This requirement is enforced by state and provincial legislation such as Quebec's Engineers Act. In other countries, no such legislation exists. In Australia, for example, state licensing of engineers is limited to the state of Queensland. Practically all certifying bodies maintain a code of ethics that they expect all members to abide by or risk expulsion. In this way, these organisations play an important role in maintaining ethical standards for the profession. Even in jurisdictions where certification has little or no legal bearing on work, engineers are subject to contract law. In cases where an engineer's work fails, he or she may be subject to the tort of negligence and, in extreme cases, the charge of criminal negligence. An engineer's work must also comply with numerous other rules and regulations such as building codes and legislation pertaining to environmental law.

## Annex D: Glossary of Terms

The following terminologies are cited mainly from 2009 United Nations International Strategy for Disaster Reduction (UNISDR) Terminology on Disaster Risk Reduction. Some of them are derived from the OSOCC and INSARAG Guidelines.

**Acceptable risk:** The level of potential losses that a society or community considers acceptable given existing social, economic, political, cultural, technical and environmental conditions.

*Comment:* In engineering terms, acceptable risk is also used to assess and define the structural and non-structural measures that are needed in order to reduce possible harm to people, property, services and systems to a chosen tolerated level, according to codes or "accepted practice" which are based on known probabilities of hazards and other factors.

**Biological hazard:** Process or phenomenon of organic origin or conveyed by biological vectors, including exposure to pathogenic micro-organisms, toxins and bioactive substances that may cause loss of life, injury, illness or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

*Comment:* Examples of biological hazards include outbreaks of epidemic diseases, plant or animal contagion, insect or other animal plagues and infestations.

**Building code:** A set of ordinances or regulations and associated standards intended to control aspects of the design, construction, materials, alteration and occupancy of structures that are necessary to ensure human safety and welfare, including resistance to collapse and damage.

*Comment:* Building codes can include both technical and functional standards. They should incorporate the lessons of international experience and should be tailored to national and local circumstances. A systematic regime of enforcement is a critical supporting requirement for effective implementation of building codes.

**Capacity:** The combination of all the strengths, attributes and resources available within a community, society or organisation that can be used to achieve agreed goals.

*Comment:* Capacity may include infrastructure and physical means, institutions, societal coping abilities, as well as human knowledge, skills and collective attributes such as social relationships, leadership and management. Capacity also may be described as capability. Capacity assessment is a term for the process by which the capacity of a group is reviewed against desired goals, and the capacity gaps are identified for further action.

**Capacity development:** The process by which people, organisations and society systematically stimulate and develop their capacities over time to achieve social and economic goals, including through improvement of knowledge, skills, systems, and institutions.

*Comment:* Capacity development is a concept that extends the term of capacity building to encompass all aspects of creating and sustaining capacity growth over time. It involves learning and various types of training, but also continuous efforts to develop institutions, political awareness, financial resources, technology systems, and the wider social and cultural enabling environment.

**Coping capacity:** The ability of people, organisations and systems, using available skills and resources to face and manage adverse conditions, emergencies or disasters.

*Comment:* The capacity to cope requires continuing awareness, resources and good management, both in normal times as well as during crises or adverse conditions. Coping capacities contribute to the reduction of disaster risks.

**Critical facilities:** The primary physical structures, technical facilities and systems which are socially, economically or operationally essential to the functioning of a society or community, both in routine circumstances and in the extreme circumstances of an emergency.

*Comment:* Critical facilities are elements of the infrastructure that support essential services in a society. They include such things as transport systems, air and seaports, electricity, water and communications systems, hospitals and health clinics, and centres for fire, police and public administration services.

**Disaster risk:** The potential disaster losses, in lives, health status, livelihoods, assets and services, which could occur to a particular community or a society over some specified future time period.

*Comment:* The definition of disaster risk reflects the concept of disasters as the outcome of continuously present conditions of risk. Disaster risk comprises different types of potential losses, which are often difficult to quantify. Nevertheless, with knowledge of the prevailing hazards and the patterns of population and socio-economic development, disaster risks can be assessed and mapped, in broad terms at least.

**Disaster risk management:** The systematic process of using administrative directives, organisations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster.

*Comment:* This term is an extension of the more general term “risk management” to address the specific issue of disaster risks. Disaster risk management aims to avoid, lessen or transfer the adverse effects of hazards through activities and measures for prevention, mitigation and preparedness.

**Disaster risk reduction:** The concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.

*Comment:* A comprehensive approach to reduce disaster risks is set out in the UN-endorsed Hyogo Framework for Action, adopted in 2005, whose expected outcome is “The substantial reduction of disaster losses, in lives and the social, economic and environmental assets of communities and countries.” The International Strategy for Disaster Reduction (ISDR) system provides a vehicle for cooperation among Governments, organisations and civil society actors to assist in the implementation of the Framework. Note that while the term “disaster reduction” is sometimes used, the term “disaster risk reduction” provides a better recognition of the ongoing nature of disaster risks and the ongoing potential to reduce these risks.

**Disaster risk reduction plan:** A document prepared by an authority, sector, organisation or enterprise that sets out goals and specific objectives for reducing disaster risks together with related actions to accomplish these objectives.

*Comment:* Disaster risk reduction plans should be guided by the Hyogo Framework and considered and coordinated within relevant development plans, resource allocations and programme activities. National level plans needs to be specific to each level of administrative responsibility and adapted to the different social and geographical circumstances that are present. The time frame and responsibilities for implementation and the sources of funding should be specified in the plan. Linkages to climate change adaptation plans should be made where possible.

**Emergency management:** The organisation and management of resources and responsibilities for addressing all aspects of emergencies, in particular preparedness, response and initial recovery steps.

*Comment:* A crisis or emergency is a threatening condition that requires urgent action. Effective emergency action can avoid the escalation of an event into a disaster. Emergency management involves plans and institutional arrangements to engage and guide the efforts of government, non-government, voluntary and private agencies in comprehensive and coordinated ways to respond to the entire spectrum of emergency needs. The expression “disaster management” is sometimes used instead of emergency management.

**Emergency services:** The set of specialised agencies that have specific responsibilities and objectives in serving and protecting people and property in emergency situations.

*Comment:* Emergency services include agencies such as civil protection authorities, police, fire, ambulance, paramedic and emergency medicine services, Red Cross and Red Crescent societies, and specialised emergency units of electricity, transportation, communications and other related services organisations.

**Environmental impact assessment:** Process by which the environmental consequences of a proposed project or programme are evaluated, undertaken as an integral part of planning and decision-making processes with a view to limiting or reducing the adverse impacts of the project or programme.

*Comment:* Environmental impact assessment is a policy tool that provides evidence and analysis of environmental impacts of activities from conception to decision-making. It is utilised extensively in national programming and project approval processes and for international development assistance projects. Environmental impact assessments should include detailed risk assessments and provide alternatives, solutions or options to deal with identified problems.

**Exposure:** People, property, systems, or other elements present in hazard zones that are thereby subject to potential losses.

*Comment:* Measures of exposure can include the number of people or types of assets in an area. These can be combined with the specific vulnerability of the exposed elements to any particular hazard to estimate the quantitative risks associated with that hazard in the area of interest.

**Extensive risk:** The widespread risk associated with the exposure of dispersed populations to repeated or persistent hazard conditions of low or moderate intensity, often of a highly localised nature, which can lead to debilitating cumulative disaster impacts.

*Comment:* Extensive risk is mainly a characteristic of rural areas and urban margins where communities are exposed to, and vulnerable to, recurring localised floods, landslides storms or drought. Extensive risk is often associated with poverty, urbanisation and environmental degradation. See also “Intensive risk.”

**Geological hazard:** Geological process or phenomenon that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

*Comment:* Geological hazards include internal earth processes, such as earthquakes, volcanic activity and emissions, and related geophysical processes such as mass movements, landslides, rockslides, surface collapses, and debris or mud flows. Hydrometeorological factors are important contributors to some of these processes. Tsunamis are difficult to categorise; although they are triggered by undersea earthquakes and

other geological events, they are essentially an oceanic process that is manifested as a coastal water-related hazard.

**Hazard:** A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

*Comment:* The hazards of concern to disaster risk reduction as stated in footnote 3 of the Hyogo Framework are "... hazards of natural origin and related environmental and technological hazards and risks." Such hazards arise from a variety of geological, meteorological, hydrological, oceanic, biological, and technological sources, sometimes acting in combination. In technical settings, hazards are described quantitatively by the likely frequency of occurrence of different intensities for different areas, as determined from historical data or scientific analysis.

See other hazard-related terms in the Glossary of Terms: Biological hazard; Geological hazard; Hydrometeorological hazard; Natural hazard; Socio-natural hazard; Technological hazard.

**Hydrometeorological hazard:** Process or phenomenon of atmospheric, hydrological or oceanographic nature that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

*Comment:* Hydrometeorological hazards include tropical cyclones (also known as typhoons and hurricanes), thunderstorms, hailstorms, tornados, blizzards, heavy snowfall, avalanches, coastal storm surges, floods including flash floods, drought, heatwaves and cold spells. Hydrometeorological conditions also can be a factor in other hazards such as landslides, wildland fires, locust plagues, epidemics, and in the transport and dispersal of toxic substances and volcanic eruption material.

**Intensive risk:** The risk associated with the exposure of large concentrations of people and economic activities to intense hazard events, which can lead to potentially catastrophic disaster impacts involving high mortality and asset loss.

*Comment:* Intensive risk is mainly a characteristic of large cities or densely populated areas that are not only exposed to intense hazards such as strong earthquakes, active volcanoes, heavy floods, tsunamis, or major storms but also have high levels of vulnerability to these hazards. See also "Extensive risk."

**Land-use planning:** The process undertaken by public authorities to identify, evaluate and decide on different options for the use of land, including consideration of long term economic, social and environmental objectives and the implications for different communities and interest groups, and the subsequent formulation and promulgation of plans that describe the permitted or acceptable uses.

*Comment:* Land-use planning is an important contributor to sustainable development. It involves studies and mapping; analysis of economic, environmental and hazard data; formulation of alternative land-use decisions; and design of long-range plans for different geographical and administrative scales. Land-use planning can help to mitigate disasters and reduce risks by discouraging settlements and construction of key installations in hazard-prone areas, including consideration of service routes for transport, power, water, sewage and other critical facilities.

**Mitigation:** The lessening or limitation of the adverse impacts of hazards and related disasters.

*Comment:* The adverse impacts of hazards often cannot be prevented fully, but their scale or severity can be substantially lessened by various strategies and actions. Mitigation measures encompass engineering

techniques and hazard-resistant construction as well as improved environmental policies and public awareness. It should be noted that in climate change policy, “mitigation” is defined differently, being the term used for the reduction of greenhouse gas emissions that are the source of climate change.

**National platform for disaster risk reduction:** A generic term for national mechanisms for coordination and policy guidance on disaster risk reduction that are multi-sectoral and inter-disciplinary in nature, with public, private and civil society participation involving all concerned entities within a country.

*Comment:* This definition is derived from footnote 10 of the Hyogo Framework. Disaster risk reduction requires the knowledge, capacities and inputs of a wide range of sectors and organisations, including United Nations agencies present at the national level, as appropriate. Most sectors are affected directly or indirectly by disasters and many have specific responsibilities that impinge upon disaster risks. National platforms provide a means to enhance national action to reduce disaster risks, and they represent the national mechanism for the ISDR.

**Natural hazard:** Natural process or phenomenon that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

*Comment:* Natural hazards are a sub-set of all hazards. The term is used to describe actual hazard events as well as the latent hazard conditions that may give rise to future events. Natural hazard events can be characterised by their magnitude or intensity, speed of onset, duration, and area of extent. For example, earthquakes have short durations and usually affect a relatively small region, whereas droughts are slow to develop and fade away and often affect large regions. In some cases, hazards may be coupled, as in the flood caused by a hurricane or the tsunami that is created by an earthquake.

**Operational work zones:** The support zone (or cold zone) is the area of a site that is free from incident hazards and may be safely used as a planning and staging area. All members of a technical rescue/USAR Team must be trained to this level to operate safely in a cold zone. The transition zone (or warm zone) is the area between the exclusion and support zones. This area is where responders enter and exit the exclusion zone. All members of a technical rescue/USAR Team must be trained to this level to operate in a cold and/or warm zone. Appropriate protective clothing is required in this zone. The exclusion zone (or hot zone) is the area where tactical search and rescue operations are conducted. This zone poses the greatest hazard and risk of injury/death. All members of a technical rescue/USAR Team must be trained to this level to operate in a warm and/or hot zone. Appropriate protective clothing and equipment is required in this zone.

**OSOCC:** The OSOCC is intended to serve as a conduit for information exchange between the Government of the affected country and various relief providers in a disaster receiving international assistance, and to provide a platform for coordination amongst actors who do not normally work in close collaboration. The OSOCC facility support on-site coordination and information exchange, and facilitates a broader coordination platform that extends well beyond the physical OSOCC.

*Comment:* To optimise its effectiveness, the OSOCC should be established in the immediate aftermath of a disaster requiring international assistance or when indicated by a change in situation of an existing emergency. This is critical in sudden-onset disasters to ensure optimal rescue efforts.

**Preparedness:** The knowledge and capacities developed by governments, professional response and recovery organisations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions.

*Comment:* Preparedness action is carried out within the context of disaster risk management and aims to build the capacities needed to efficiently manage all types of emergencies and achieve orderly transitions from response through to sustained recovery. Preparedness is based on a sound analysis of disaster risks and good linkages with early warning systems, and includes such activities as contingency planning, stockpiling of equipment and supplies, the development of arrangements for coordination, evacuation and public information, and associated training and field exercises. These must be supported by formal institutional, legal and budgetary capacities. The related term “readiness” describes the ability to quickly and appropriately respond when required.

**Prevention:** The outright avoidance of adverse impacts of hazards and related disasters.

*Comment:* Prevention (i.e. disaster prevention) expresses the concept and intention to completely avoid potential adverse impacts through action taken in advance. Examples include dams or embankments that eliminate flood risks, land-use regulations that do not permit any settlement in high risk zones, and seismic engineering designs that ensure the survival and function of a critical building in any likely earthquake. Very often the complete avoidance of losses is not feasible and the task transforms to that of mitigation. Partly for this reason, the terms prevention and mitigation are sometimes used interchangeably in casual use.

**Prospective disaster risk management:** Management activities that address and seek to avoid the development of new or increased disaster risks.

*Comment:* This concept focuses on addressing risks that may develop in future if risk reduction policies are not put in place, rather than on the risks that are already present and which can be managed and reduced now. See also Corrective disaster risk management.

**Public awareness:** The extent of common knowledge about disaster risks, the factors that lead to disasters and the actions that can be taken individually and collectively to reduce exposure and vulnerability to hazards.

*Comment:* Public awareness is a key factor in effective disaster risk reduction. Its development is pursued, for example, through the development and dissemination of information through media and educational channels, the establishment of information centres, networks, and community or participation actions, and advocacy by senior public officials and community leaders.

**RDC (Reception Departure Centre):** The RDC serves as the central intake hub for the international relief traffic and is often the first OSOCC component established in the affected country. The RDC must be prepared to facilitate the basic services of an OSOCC including delivering situational and operational briefings, providing basic logistical support, facility the operational activities of response teams and tracking recourses. The extent to which these services are conducted will shift as the OSOCC becomes established and/or the affected country gains the means to facilitate incoming/outgoing international resources.

**Recovery:** The restoration, and improvement where appropriate, of facilities, livelihoods and living conditions of disaster-affected communities, including efforts to reduce disaster risk factors.

*Comment:* The recovery task of rehabilitation and reconstruction begins soon after the emergency phase has ended, and should be based on pre-existing strategies and policies that facilitate clear institutional responsibilities for recovery action and enable public participation. Recovery programmes, coupled with the heightened public awareness and engagement after a disaster, afford a valuable opportunity to develop and implement disaster risk reduction measures and to apply the “build back better” principle.

**Residual risk:** The risk that remains in unmanaged form, even when effective disaster risk reduction measures are in place, and for which emergency response and recovery capacities must be maintained.

*Comment:* The presence of residual risk implies a continuing need to develop and support effective capacities for emergency services, preparedness, response and recovery together with socio-economic policies such as safety nets and risk transfer mechanisms.

**Resilience:** The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions.

*Comment:* Resilience means the ability to "spring back from" a shock. The resilience of a community in respect to potential hazard events is determined by the degree to which the community has the necessary resources and is capable of organising itself both prior to and during times of need.

**Response:** The provision of emergency services and public assistance during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of the people affected.

*Comment:* Disaster response is predominantly focused on immediate and short-term needs and is sometimes called "disaster relief". The division between this response stage and the subsequent recovery stage is not clear-cut. Some response actions, such as the supply of temporary housing and water supplies, may extend well into the recovery stage.

**Risk:** The combination of the probability of an event and its negative consequences.

*Comment:* This definition closely follows the definition of the ISO/IEC Guide 73. The word "risk" has two distinctive connotations: in popular usage the emphasis is usually placed on the concept of chance or possibility, such as in "the risk of an accident"; whereas in technical settings the emphasis is usually placed on the consequences, in terms of "potential losses" for some particular cause, place and period. It can be noted that people do not necessarily share the same perceptions of the significance and underlying causes of different risks.

**Risk assessment:** A methodology to determine the nature and extent of risk by analysing potential hazards and evaluating existing conditions of vulnerability that together could potentially harm exposed people, property, services, livelihoods and the environment on which they depend.

*Comment:* Risk assessments (and associated risk mapping) include: a review of the technical characteristics of hazards such as their location, intensity, frequency and probability; the analysis of exposure and vulnerability including the physical social, health, economic and environmental dimensions; and the evaluation of the effectiveness of prevailing and alternative coping capacities in respect to likely risk scenarios. This series of activities is sometimes known as a risk analysis process.

**Risk management:** The systematic approach and practice of managing uncertainty to minimise potential harm and loss.

*Comment:* Risk management comprises risk assessment and analysis, and the implementation of strategies and specific actions to control, reduce and transfer risks. It is widely practiced by organisations to minimise risk in investment decisions and to address operational risks such as those of business disruption, production failure, environmental damage, social impacts and damage from fire and natural

hazards. Risk management is a core issue for sectors such as water supply, energy and agriculture whose production is directly affected by extremes of weather and climate.

**Risk transfer:** The process of formally or informally shifting the financial consequences of particular risks from one party to another whereby a household, community, enterprise or state authority will obtain resources from the other party after a disaster occurs, in exchange for ongoing or compensatory social or financial benefits provided to that other party.

*Comment:* Insurance is a well-known form of risk transfer, where coverage of a risk is obtained from an insurer in exchange for ongoing premiums paid to the insurer. Risk transfer can occur informally within family and community networks where there are reciprocal expectations of mutual aid by means of gifts or credit, as well as formally where governments, insurers, multi-lateral banks and other large risk-bearing entities establish mechanisms to help cope with losses in major events. Such mechanisms include insurance and re-insurance contracts, catastrophe bonds, contingent credit facilities and reserve funds, where the costs are covered by premiums, investor contributions, interest rates and past savings, respectively.

**Socio-natural hazard:** The phenomenon of increased occurrence of certain geophysical and hydro-meteorological hazard events, such as landslides, flooding, land subsidence and drought that arise from the interaction of natural hazards with overexploited or degraded land and environmental resources.

*Comment:* This term is used for the circumstances where human activity is increasing the occurrence of certain hazards beyond their natural probabilities. Evidence points to a growing disaster burden from such hazards. Socio-natural hazards can be reduced and avoided through wise management of land and environmental resources.

**Structural and non-structural measures:** Structural measures: Any physical construction to reduce or avoid possible impacts of hazards, or application of engineering techniques to achieve hazard- resistance and resilience in structures or systems; Non-structural measures: Any measure not involving physical construction that uses knowledge, practice or agreement to reduce risks and impacts, in particular through policies and laws, public awareness raising, training and education.

*Comment:* Common structural measures for disaster risk reduction include dams, flood levies, ocean wave barriers, earthquake-resistant construction, and evacuation shelters. Common non-structural measures include building codes, land use planning laws and their enforcement, research and assessment, information resources, and public awareness programmes. Note that in civil and structural engineering, the term “structural” is used in a more restricted sense to mean just the load-bearing structure, with other parts such as wall cladding and interior fittings being termed non-structural.

**Technological hazard:** A hazard originating from technological or industrial conditions, including accidents, dangerous procedures, infrastructure failures or specific human activities, that may cause loss of life, injury, illness or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

*Comment:* Examples of technological hazards include industrial pollution, nuclear radiation, toxic wastes, dam failures, transport accidents, factory explosions, fires, and chemical spills. Technological hazards also may arise directly as a result of the impacts of a natural hazard event.

**Training Levels:** Awareness Level: This level represents the minimum capability of organisations that provide response to technical search and rescue incidents. Operations Level: This level represents the capability of organisations to respond to technical search and rescue incidents and to identify hazards, use

rescue equipment, and apply limited techniques specified in this standard to support and participate in technical search and rescue incidents. Technician Level: This level represents the capability of organisations to respond to technical search and rescue, and/or USAR incidents and to identify hazards use rescue equipment, and apply advanced techniques specified in this standard necessary to coordinate, perform and supervise technical search and rescue incidents.

**Technological hazard:** A hazard originating from technological or industrial conditions, including accidents, dangerous procedures, infrastructure failures or specific human activities, that may cause loss of life, injury, illness or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

*Comment:* Examples of technological hazards include industrial pollution, nuclear radiation, toxic wastes, dam failures, transport accidents, factory explosions, fires, and chemical spills. Technological hazards also may arise directly as a result of the impacts of a natural hazard event.

**Vulnerability:** The characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard.

*Comment:* There are many aspects of vulnerability, arising from various physical, social, economic, and environmental factors. Examples may include poor design and construction of buildings, inadequate protection of assets, lack of public information and awareness, limited official recognition of risks and preparedness measures, and disregard for wise environmental management. Vulnerability varies significantly within a community and over time. This definition identifies vulnerability as a characteristic of the element of interest (community, system or asset) which is independent of its exposure. However, in common use the word is often used more broadly to include the element's exposure.

**Worksite:** Any site where signify USAR operations are carried out. Also, worksite is where significant USAR operations normally only take place when there is thought to be the potential for a live rescue.

*Comment:* Worksites will typically be one building where one USAR Team or squad is working because of a potential live rescue. But a worksite could be much larger or much smaller. A large building or complex of buildings e.g. a hospital may be identified as a single worksite. Alternatively, the site of a single rescue in an area of only a few square metres would also be identified as a Worksite.

## Annex E: Table of Changes to INSARAG Guidelines 2015-20

| | Amended Topic/Subject |
|---|---|
| **1** | Implemented ISG 18 decisions on NAP/IRNAP<br>• Adopted the endorsed manual as an integral part of Manual A, including relevant checklists. |
| **2** | Implemented ISG 18 decisions on Light Teams<br>• Updated the USAR Light Team description to reflect the Classified Light Teams concept.<br>• Updated the team structure and description across the manual. |
| **3** | Key changes in content<br>• To keep the format consistent and content up to date (e.g. UCC).<br>• Included a write-up on "Technical Recognition Group (TRG)" to be in line with IRNAP manual (guidance note) and a requirement for the TRG to observe the accreditation exercise.<br>• Included a description of responsibilities of stakeholders in the IRNAP process.<br>• Highlighted the "staffing level suggested" in bold.<br>• Updated the suggested number of K9 in the team composition tables. |
| **4** | Infographics<br>• Updated figures 1 and 2. |
| **5** | Annexes<br>• Introduction of "Tables of Changes to the INSARAG Guidelines from 2015-20" as the new Annex E to capture the updates made from the 2015 Guidelines.<br>• Annexes from the 2015 Guidelines have been rearranged with the following notable changes.<br>○ "Annex C: Capacity Assessment Checklist for National USAR Teams" has been removed and superseded by the "INSARAG External Support and Recognition Process (IESRP) on national USAR tam accreditation processes" located in Manuals" → "IRNAP" of the Guidance Notes<br>○ "Annex D: Sample for the Creation of a Country USAR Accreditation System" has been removed and main concepts incorporated into Section 3.<br>○ "Annex E: Sample Concept Note – INSARAG Regional Earthquake Response Simulation Exercise" has been moved to "Manuals" → "Others" of the Guidance Notes with the title "INSARAG Earthquake Response Exercise Guide." |