

## **H. URBAN SEARCH AND RESCUE**

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### **H.1. Introduction**

International Urban Search and Rescue (USAR) is an extremely complex and fast moving form of international assistance normally provided during an earthquake affecting an urban area or semi urban area. International USAR teams are prepared to respond at short notice and will start their preparations for deployment immediately after the “Breaking Emergency” posting on the Virtual OSOCC and will respond to the disaster area as soon as a request for international assistance has been put forward by the affected country. In some cases, teams may deploy following bilateral agreements with the affected country. This implies that USAR operations will often be well underway when the UNDAC team arrives.

Coordinating an USAR operation under these circumstances doesn’t differ significantly from coordinating relief efforts in other phases of an emergency, however everything moves much faster and specialised knowledge of USAR operations is necessary for effective coordination. The UNDAC team must be aware of the special time constraints due to life saving efforts that apply to USAR operations and adapt its work accordingly. Because of this complexity, USAR teams should be staffed and equipped to reinforce the UNDAC team with USAR liaison officers to facilitate operations planning.

This chapter must be read in conjunction with Chapter E, Coordination in the Field, as several aspects, e.g., specifics of setting up and operating an On-Site Operations Coordination Centre (OSOCC), are covered there.

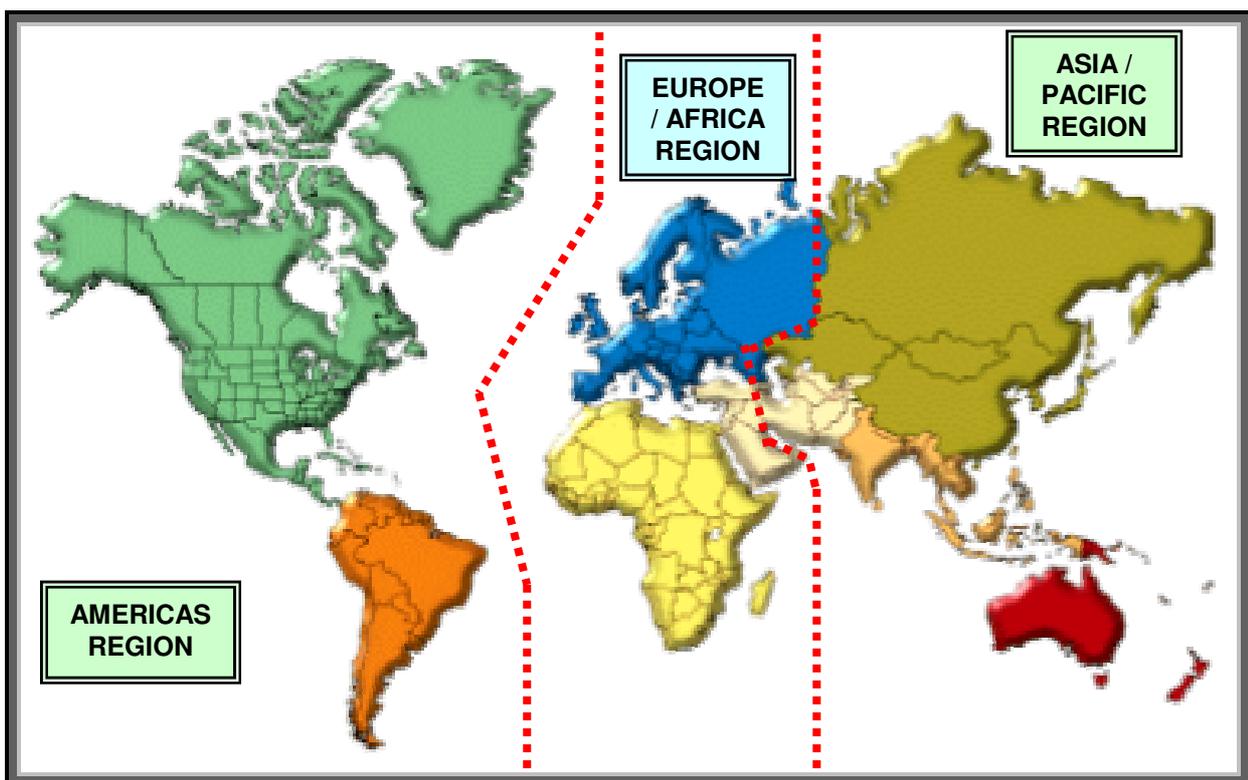
## H.2. International Search and Rescue Advisory Group (INSARAG)

INSARAG was formed in 1991, as a cooperative effort by countries that are either prone to earthquakes or disasters that may cause structural collapse, or countries and organizations that are providers of international USAR assistance, the UN, International Federation of Red Cross and Red Crescent Societies (IFRC) and other international responders.

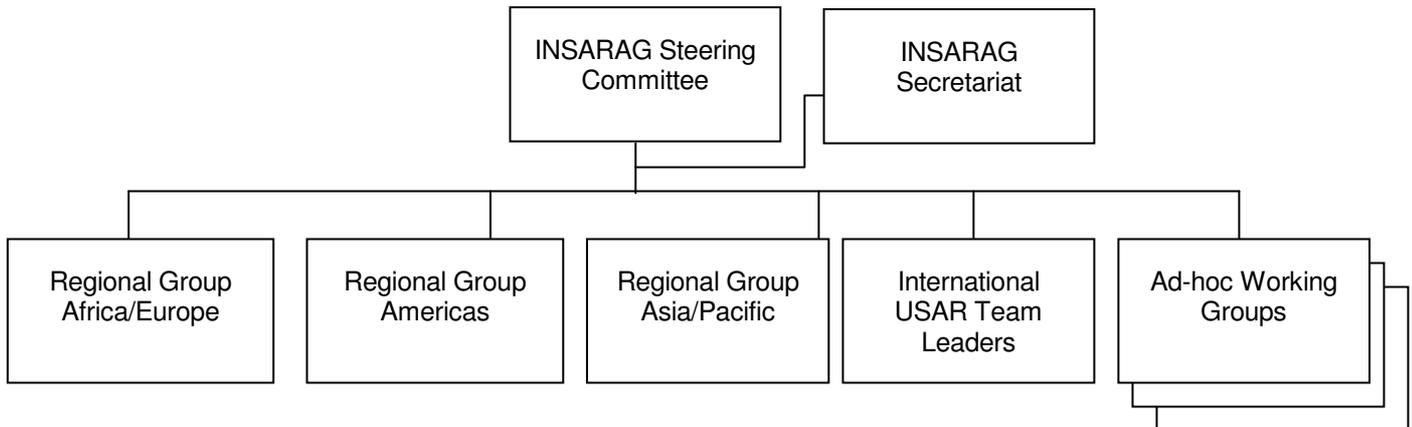
During times of disaster, affected and responding countries apply the INSARAG methodology, which ensures USAR teams understand the roles and responsibilities of the Local Emergency Management Authority (LEMA) and are able to integrate effectively, resulting in a coordinated and efficient rescue effort.

INSARAG activities are designed to improve emergency preparedness including strengthening the cooperation between international USAR teams and the exchange of information on operational procedures and lessons learned.

### *INSARAG regional groups*



## *Structure*



The INSARAG regional groups correspond to the UNDAC regional groups, and the Field Coordination Support Section (FCSS), which is responsible for managing the UNDAC system, is also the INSARAG secretariat. These two entities are closely related.

### **H.2.1. INSARAG Guidelines**

Since 1991, significant progress has been made in improving standards for international USAR capacity and the coordination of international response during major sudden-onset disasters. The achievements of INSARAG have established a worldwide network of stakeholders in collapsed structure disaster response and the development of the INSARAG Guidelines. The commitment of INSARAG member countries and organizations was also instrumental in the UN General Assembly's unanimous adoption of Resolution 57/150 on "Strengthening the Effectiveness and Coordination of International Urban Search and Rescue Assistance" on 16 December 2002. This resolution endorses the INSARAG Guidelines as the reference for international USAR response.

The INSARAG Guidelines have been collectively prepared by USAR responders around the world to guide international USAR teams and disaster-prone countries to perform disaster collapsed structure response operations during major urban disasters. The Guidelines are a living document and will be improved whenever lessons are learned and best practices identified through the evaluation of USAR operations.

#### ***Purpose***

The INSARAG Guidelines aim to provide a methodology for the country affected by a sudden onset disaster causing large-scale structural collapse as well as international USAR teams responding to the affected country. They also outline the role of UN assisting affected countries in on-site coordination.

The Guidelines address international USAR response in a cycle, which includes the following phases:

- **Preparedness** – describes the period between disaster responses during which time lessons learned from previous experiences are reviewed and relevant amendments and improvements to Standard Operating Procedures (SOPs) are made, training is conducted and planning for future response occurs.

- **Mobilization** – describes the actions required immediately following the occurrence of a disaster and an international USAR team prepares to respond to assist the affected country.
- **Operations** – describes all the actions required when an international USAR team arrives at the Reception Departure Centre (RDC), registers with the OSOCC, reports to LEMA and performs USAR operations until it is instructed to cease USAR operations.
- **Demobilization** – describes the actions required when the USAR team has been instructed that USAR operations are to cease and commences its withdrawal, coordinates its departure through the OSOCC and departs from the affected country through the RDC.
- **Post-Mission** – describes the actions required when an international USAR team has returned home and is required to complete and submit a post-mission report and conduct a lessons learned review to improve the overall effectiveness and efficiency for response to future disasters.

The full version of the INSARAG Guidelines may be found in the UNDAC mission software.

### **H.2.2. USAR team classification system**

Disasters around the world, affecting urban areas of high density populations living and working in concrete and reinforced concrete single and multi story dwellings, has increased the need for sophisticated USAR capabilities. Advances in technology have improved the ability to locate, rescue, and provide medical treatment to trapped victims. Many countries have developed a USAR capability and, when required, send teams of well-trained USAR experts to assist countries affected by disasters causing large-scale structural collapse.

While deployment of international USAR teams has been of great benefit to trapped victims and the affected country, lessons learned have revealed the need for responding USAR teams to be integrated within a well coordinated system to ensure the most appropriate use of available USAR resources. There is a need to classify international USAR teams according to their operational capabilities in order to ensure that only qualified and appropriate USAR resources are deployed to an emergency.

The classification system will allow affected countries, donor responding countries, and NGOs to:

- Coordinate the response of an appropriate USAR team to a disaster.
- Ensure the appropriate management requirements for a USAR team, including the prioritisation of resource allocation by the affected country.
- Ensure a functional USAR team structure that assures a safe and effective operational response.
- Ensure that only teams with adequate operational capability deploy internationally.

Only USAR teams that meet the requirements of the USAR team classification system will be registered in the INSARAG USAR directory.

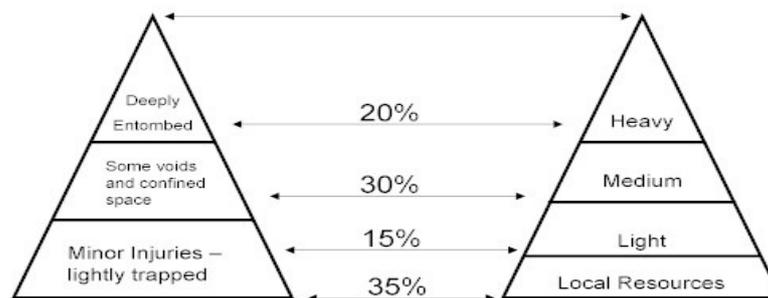
### ***Classification levels of USAR teams***

All USAR teams, irrespective of their capacity classification and operational involvement, should comprise of the following components:

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

Based on their operational capabilities USAR teams have been classified as:

- **Light USAR teams** - have the operational capability to assist with surface search and rescue in the immediate aftermath of the disaster. Light USAR teams usually come from the affected country and neighbouring countries. It is not recommended that light USAR teams deploy internationally to emergencies.
- **Medium USAR teams** - have the operational capability for technical search and rescue operations in structure collapse incidents. Medium USAR teams are capable of breaking, breaching and cutting concrete, typically found in suburban areas. Medium USAR teams are not expected to have an ability to cut, break and breach concrete reinforced with structural steel. International medium USAR teams travelling to an affected country should be operational in the affected country within 32 hours of the posting of the disaster on the Virtual OSOCC.
- **Heavy USAR teams** - have the operational capability for difficult technical search and rescue operations in structure collapse incidents, particularly those involving structures reinforced with structural steel. Heavy teams are envisaged for international assistance in sudden onset disasters resulting in collapses of multiple reinforced concrete structures, typically found in urban settings, when national response capacity has either been overwhelmed or does not possess the required capability. International heavy USAR teams travelling to an affected country should be operational in the affected country within 48 hours of the posting of the disaster on the Virtual OSOCC.



Given above, is a diagram showing a utilization matrix of heavy, medium and light USAR teams.

### **H.2.3. Responsibilities of OCHA, affected countries, assisting countries, USAR teams and the UNDAC team**

A division of responsibilities in a USAR operation have been defined in the INSARAG Guidelines according to the different phases of international USAR operations (see H.2.1). Given below is summary of these responsibilities.

#### ***OCHA***

OCHA is expected to:

- Activate the Virtual OSOCC and provide continuous updates regarding situation, entry procedures, specific requests for assistance, baseline information of the affected country, etc.
- Work closely with the affected country to ensure the timely release of a request for international assistance.
- Communicate with UN representatives of the affected country.
- Deploy an UNDAC team if required.
- Request UNDAC Support modules, as required.
- Provide support to the UNDAC team, as required.
- Request additional IHP Support modules, as required.

#### ***Affected country***

An affected country is expected to:

- Conduct immediate situation and needs assessments, identify priorities and report them to the international community through OCHA and the Virtual OSOCC.
- When required, make the request for international assistance as soon as possible.
- Implement procedures for receiving international USAR teams into the country including visa assistance and entry permission for special equipment (communications, search dogs, emergency medical pharmaceuticals, and specialized, technical equipment for search and rescue operations).
- Supply USAR team logistics support, e.g., interpreters, guides, fuel, transport, water, maps, Base of Operations location, etc.
- Security for personnel, equipment, and facilities.
- Strengthen LEMA to manage the disaster.
- Maintain representation at the RDC and the OSOCC to ensure a coordinated response and national priorities are met.
- Declare the end of the USAR operations phase.

#### ***Assisting country***

An assisting country is expected to:

- Maintain a 24 hour focal point.
- Bear all costs related to international deployment.
- Implement transport procedures for rapid deployment of USAR teams.
- Post information regarding deployment of USAR teams on the Virtual OSOCC.
- Provide all logistical and administrative support that may be required by the team when on mission, including a capability to re-supply, if necessary.

### ***USAR teams***

USAR teams are expected to:

- Maintain proper travel documentation, inoculations, and immunization for all members and dogs.
- Ensure self-sufficiency for the duration of the mission.
- Deploy a coordination element in order to establish or sustain an RDC and an OSOCC as required.
- Complete documents for all phases of the operation and provide copies to the OSOCC.
- Maintain a 24-hour operations focal point.
- Participate in OSOCC meetings regarding USAR operations.
- Conduct operations in accordance with the INSARAG Guidelines.
- Ensure proper conduct of its team members.
- Provide support to the UNDAC team as requested.
- Coordinate its withdrawal with the OSOCC.

### ***UNDAC***

The UNDAC team is expected to:

- Establish (if not already done) and maintain an RDC and an OSOCC throughout the operation.
- Facilitate the coordination of the USAR operation in close cooperation with LEMA and the USAR teams (see also Chapter E – Coordination in the Field).
- Establish and maintain information management systems between the field, UN Resident Coordinator/Humanitarian Coordinator (RC/HC), national authorities, and the international community (see also Chapter F – Information Management).
- Coordinate assessments of further needs (see also Chapter G – Disaster Assessment).

## **H.3. UNDAC team tasks in USAR operations**

While the principles for coordination remain the same, UNDAC teams have a specific role in international USAR operations as defined in the INSARAG Guidelines. These include the setting up and operating of an RDC and an OSOCC to support LEMA and facilitate the effective utilization of international USAR teams.

### **H.3.1. Establishment of OSOCC and Reception Departure Centre (RDC)**

#### ***RDC***

The RDC is an extension of the OSOCC at the point of entry in-country (normally an airport). It works in close cooperation with customs, immigration and other local authorities. If the UNDAC team has not yet arrived, the INSARAG Guidelines specify that this function is temporarily performed by the first international USAR teams to arrive. Due to their high level of preparedness, this happens quite regularly.

The UNDAC team will then be facing the task of having to take over an already existing structure. This process should be done gradually where one is given ample time to be briefed by the USAR personnel manning the structure. One needs updates regarding situation,

procedures and arrangements with national authorities before one takes over the responsibility.

INSARAG encourages countries to incorporate the establishment, staffing and operation of a RDC into disaster preparedness plans and this should be practically tested during routine disaster preparedness exercises.

The RDC is established in order to coordinate activities with airport authorities and LEMA. It should:

- Identify a suitable location for the RDC.
- Ensure the RDC is visible and well marked for incoming teams, e.g., flags, directional signs, etc.
- Establish a waiting area for incoming teams to reduce congestion at the RDC.
- Establish communications link to the OSOCC and Virtual OSOCC as soon as possible.
- Collect relevant information for incoming resources, including:
  - Immigration and customs issues related to visa, immunizations, communications equipment, medical and rescue equipment.
  - Airport logistics with regard to cargo handling and aircraft parking.
  - Transportation of personnel and equipment to the disaster site.
  - Access to petroleum products and compressed gases.
  - Access to updated incident information.
  - Coordination structures and contact details (LEMA, OSOCC).
  - Matters pertaining to safety and security issues.
  - Access to maps, interpreters, guides.
- Register and brief incoming resources.
- Request additional staff from incoming teams to strengthen the RDC as appropriate.

### *OSOCC*

The OSOCC is established close to the LEMA and as close to the disaster site as is safely possible. It provides a platform for the coordination of international responders and LEMA. The OSOCC is established by the UNDAC team or by the first arriving international USAR team who will then hand over the OSOCC to the UNDAC team when they arrive. The main purpose of the OSOCC is to assist LEMA with the coordination of international and national USAR teams as well as other sectoral responders, e.g., health, water/sanitation, shelter, etc.

In disasters where the devastation covers huge areas and there is a need for international coordination at remote disaster sites, the UNDAC team or first arriving USAR teams in these areas will make use of a sub-OSOCC concept. When this situation arises, the main OSOCC will generally be established in a major national or regional coordination centre with one or more sub OSOCCs being established at various disaster sites as required.

The functional elements of an OSOCC will be the same as described in Chapter E – Coordination in the Field. However, some functions might need more attention than others. Due to the heavy and sudden influx of international teams one may need to assign more people to functions such as OSOCC Management, Operations, Logistics, and Liaison.

In the beginning of an UNDAC mission to an emergency requiring USAR operations, the team might consist of fewer members than is needed in order to achieve their tasks. Several USAR team liaison-staff have completed OSOCC training and may be brought into the team and assigned tasks within functional elements of the OSOCC. The UNDAC team should not hesitate to utilize these liaisons as they often have the specific skills and experience needed in coordinating a USAR operation. One may also achieve an effective platform for coordination and information sharing as the stakeholders are involved in the process from the beginning.

The following actions should be taken by the OSOCC in a USAR-operation to coordinate activities with LEMA:

- Determine the role of the OSOCC regarding the coordination of international actors and relief.
- Establish an information exchange process between LEMA and OSOCC.
- Identify a suitable location for the OSOCC ensuring visibility for incoming resources, e.g., flags, directional signs, etc.
- Establish communications link to the RDC and Virtual OSOCC as soon as possible.
- Gather the following information:
  - Current incident information and update reports accordingly.
  - Establish the priority needs of the affected country.
  - Record USAR Team Fact Sheet information of incoming resources (see UNDAC mission software).
  - Identify potential locations for the Base of Operations.
  - Obtain a map of impacted area.
  - Establish the survivor hand-over procedure.
  - Identify the location of cranes, loaders, forklifts and lorries, petroleum products, timber, compressed gases, interpreters and guides and establish the procedure of how to gain access to these resources.
  - Arrange transportation for personnel and equipment to and from work sites.
  - Establish coordination structures and meeting details.
  - Establish a plan to address safety and security issues.
- Assist LEMA with assigning USAR and other resources based on the above mentioned information.
- Register and brief incoming resources.
- Request additional staff from incoming teams to strengthen OSOCC as appropriate.
- Gather and document information from OSOCC Planning form (see UNDAC mission software) in order to:
  - Analyze the priority needs of the affected country in relation to the resources on hand.
  - Capture and analyze information supplied by USAR teams and other actors.
  - Determine gaps in operations and recommended appropriate changes.
  - Consider long-term plans with regard to additional resources and reassignment.
- Display information onto incident maps.
- Prepare for and facilitate daily USAR operations meeting.
- Review and update Plan of Action based upon OSOCC planning meeting results and other information received:
  - Length of operational periods to accomplish assigned tasks.
  - Briefing schedules.

- Prepare USAR operations input for the UNDAC Situation Report;

**H.3.2. Planning of USAR operations**

If you fail to plan you plan to fail. This saying applies to all kinds of operations, but is very important in a fast-moving one where it is easy – and tempting – to rush into things without appropriate planning. However, the planning should be done in a timely and effective fashion, focusing on saving the lives of survivors trapped underneath the rubble. USAR planning is often a delicate balance between the urge to perform life-saving operations and the patience one needs to plan properly.

In cooperation with LEMA, the operational element of the USAR teams should be brought into the planning process as they are the ones with the best knowledge of operating in urban areas with collapsed building structures.

The affected area may have been sub-divided into operational sectors by LEMA to make it easier to coordinate. It is suggested that the OSOCC USAR operations coordination cell maintain a simple visual matrix to keep track of the utilization and availability of international USAR teams in each operational sector. This should supplement the standard map of USAR operations showing USAR team deployment and Base of Operations. An example is given below. A similar matrix could also be used by the OSOCC for depicting other sectoral deployments if found useful.

<b>Sector A</b>	
<u>Available teams</u> China Singapore Germany	<u>Working teams</u> Norway India US – Fairfax
<u>Trend</u> Decreasing intensity of operations	<u>Completed sites</u> Hospital Mall Apartment 4

The UNDAC team should act as a facilitator of the planning process (present consolidated information, represent it on maps, act as liaison with LEMA, etc.), but the operational details should be left to the USAR teams, themselves. Keep in mind that this is not the time to have lengthy coordination meetings with long discussions and decisions made by consensus. The UNDAC team might want to assume a more firm kind of leadership and authority than in other phases of disaster relief work. In operational situations of this kind international teams will expect clear and precise directions and tasking.

### ***Organizing USAR assessments***

USAR assessments should be organized by the UNDAC team in cooperation with LEMA and USAR teams and focus on:

- Overall situation.
- Response.
- Extent of affected area.
- Type of collapsed structures.
- Hazardous materials (HAZMAT).
- Secondary threats.
- Logistical arrangements.
- Presence of heavy equipment and materials locally that could be utilized, e.g., bulldozers, excavators, timber for shoring, etc.

As with planning of operations and staffing of the OSOCC, the USAR teams should be used in assessing the situation, priorities, and needs in a USAR operation. The USAR teams should be encouraged to perform assessment activities simultaneously with operations within their assigned area. Their findings should be reported to the UNDAC team for information processing and distribution. See also Chapter G – Disaster Assessment for assessment checklists.

### **H.3.3. Demobilization of USAR teams**

The decision to end the life-saving effort of a USAR operation should be taken by the LEMA. Based on the recommendations of the USAR teams, the UNDAC team should advise LEMA of the appropriate time to end this phase but leave it to LEMA to take the decision. This is often a difficult decision for LEMA to make as it often has political implications for the local authorities.

The UNDAC team and OSOCC should assist with the USAR demobilization phase by:

- Establishing a departure schedule. The USAR teams should provide the OSOCC with the necessary information for this on a standardized form regarding requests and information about their departure. This form is included in the UNDAC mission software and also in the INSARAG Guidelines.
- Determining the teams' logistical requirements. In cooperation with the LEMA, the OSOCC should organize the logistical arrangement of the teams' departures from the affected area to their point of departure. As many teams will be ready to leave at the same time, a heavy strain on local transportation resources may result. A time-schedule should be carefully planned in order to avoid gaps and bottlenecks.
- Ensuring that the RDC is converted into a Departure Centre and debrief the departing international USAR teams.

Several USAR teams may also want to donate their equipment to the continuing relief-operation. The OSOCC will then be responsible for coordinating the distribution and utilization of these donations.

#### **H.4. INSARAG markings during a USAR operation**

It is important that information related to structure identification, conditions and hazards, and victim status are posted in a standardized fashion to ensure uniformity and clarity, as USAR teams will originate from countries around the world.

The INSARAG Guidelines have developed a standardized format of marking assessed and searched sites. International USAR teams are required to use the INSARAG marking, signalling and identification system to communicate assessment and rescue results with other actors and to ensure standardized communication at the site.

A complete overview of markings is found in the INSARAG guidelines and the UNDAC mission software, but relevant extracts are given below.

##### ***Structural marking***

Structural marking should be applied on collapsed structures assessed by USAR teams. The marking should be placed near the point of entry on the exterior of the collapsed structure that offers the best visibility. All assessment results are to be reported to the OSOCC immediately.

The marking consists of:

- 1 X 1 meter square box.

Inside the box:

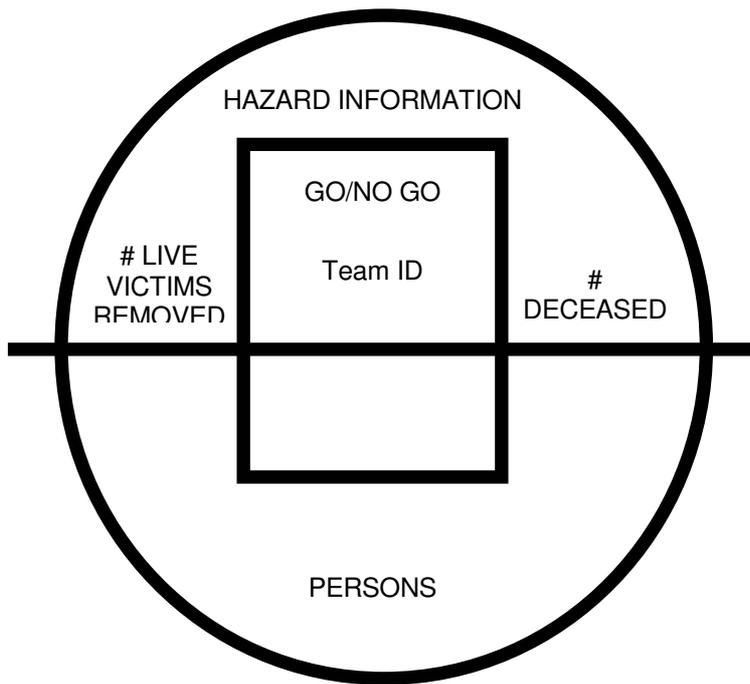
- Go or No Go.
- Team identification.
- Date and time start.
- Date and time finish.

Outside the box:

- Hazard information (top).
- Missing persons (bottom).
- Live victims extricated (left).
- Dead victims removed (right).

Additional information:

- When the USAR team has completed work on the structure to its capacity a circle is to be drawn around the entire marking
- After the entire completion of work on the structure and confirmed information that there are no more rescue opportunities, a horizontal line is to be drawn through the entire marking.



**Signalling**

- Effective emergency signalling is essential for the safe operation of USAR team personnel operating at a disaster site.
- All USAR team members should be briefed regarding emergency signals.
- Emergency signals should be universal for all USAR teams.
- Signals must be clear and concise.
- Team members are required to immediately respond to all emergency signals.
- Air horns or other appropriate hailing devices should be used to sound the appropriate signals as follows:

Evacuate



(3 short signals, 1 second each – repeatedly until site is cleared)

Cease Operations – Quiet



(1 long signal, 3 seconds long)

Resume Operations



(1 long signal + 1 short signal)