LESSON

04

STRUCTURAL TRIAGE AND THE INSARAG MARKING SYSTEM

Lecture-03, Practical-02 . Total 05 Periods

LESSON OBJECTIVES

Upon completion of this lesson, you will be able to:

1. Describe Sectorization, its identification and five ASR levels.
2. List four categories of worksite Triage.
3. List at least eight factors to consider in worksite triage.
4. Define the INSARAG marking system, List and describe the eight categories of INSARAG marking system.

United nations Office for the Coordination of Humanitarian Affairs (UN-OCHA).

The United Nations Office for the Coordination of Humanitarian Affairs (OCHA) is a United Nations (UN) body established in December 1991 by the General Assembly to strengthen the international response to complex emergencies and natural disasters. It is the successor to the Office of the United Nations Disaster Relief Coordinator (UNDRO).

The Department of Humanitarian Affairs (DHA) was established shortly thereafter by the Secretary-General, but in 1998 was merged into OCHA, which became the UN's main focal point on major disasters.

OCHA's mandate was subsequently broadened to include coordinating Humanitarian response, policy development and humanitarian advocacy. Its activities include organizing and monitoring humanitarian funding, advocacy, policy - making and information exchange to facilitate rapid - response teams for emergency relief. OCHA is led by the Under - Secretary - General for Humanitarian Affairs and Emergency Relief Coordinator (USG/ERC), appointed for a five-year term.

INTERNATIONAL SEARCH AND RESCUE ADVISORY GROUP (INSARAG)

INSARAG is global network of more than 90 countries and organizations under the United Nations umbrella. INSARAG deal with urban search and rescue (USAR) related issues, aiming to establish minimum international standards for USAR teams and methodology for international coordination in earthquake response based on the INSARAG Guidelines endorsed by the United Nations General Assembly Resolution 57/150 of 2002,on “Strengthening the Effectiveness and Coordination of International Urban Search and Rescue Assistance

1

Sectorization

In case of large scale events, effecting large area or numerous cities, or even more than one country, Sectorization is done to allow effective co-ordination of Search and Rescue efforts for better operational planning and effective deployment of search and rescue teams.

Notes

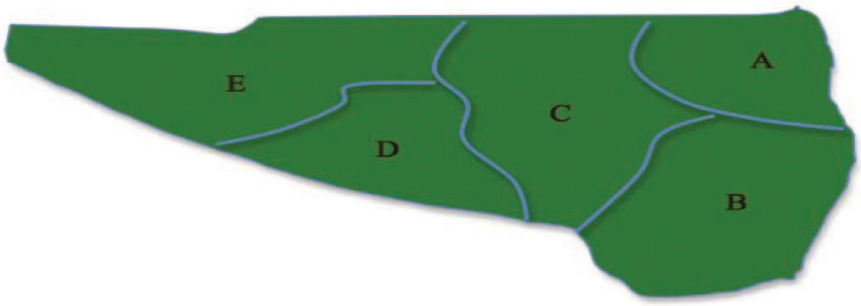
1.1 Creation of Sectors

Areas of large-scale destruction are geographically divided into smaller areas / sectors to ensure effective coordination of search and rescue teams. It improves operational planning and effective deployment of search and rescue teams. Sectorization should be undertaken at the **earliest** possible stage of a disaster response to ensure its effectiveness.

Sectorization 1.2 Sector Identification (Cont.)

A simple lettering system is used to code each sector, like A, B, C, D and so on and a local name or description can also be added to ensure clarity. e.g. sector A, Kashmir etc.

► ***Figure:***
Sectorizing the affected areas into smaller manageable sectors.



1.3 Worksite Identification

It is defined as "any site where significant Urban Search & Rescue operations are carried out". Significant USAR operations normally only take place when there is thought to be the potential for a live rescue. It can range from a single site in a building to much larger area or complex of buildings. Each worksite should be allocated its own worksite ID using following protocols:

1.3.1 The first part is the sector letter allocated to the area the site is in e.g. A.

1.3.2 As a worksite is identified, a number is then sequentially allocated; 1, 2, 3 etc.

Notes

Notes

So, the Sector letter and allocated number produces a unique Worksite ID e.g., A-1, A-2, A-3 etc. If more than one team is in the same sector, then the UCC will instruct teams on which numbers to use e.g. Team 1 uses 1 to 20, Team 2 uses 21 to 40 etc.

A Worksite can further be subdivided into smaller sites and identification can be done by adding suffix letter to the original single Worksite ID, e.g. A-1a, A-2a etc.

1.4 Team Identification Code:

Each USAR Team is identified by a unique Team Identification Code, and it is done in the following manner:

(1) The three letter Olympic code of the country
(2) A number to differentiate team from the same country e.g. JPN-1, AUS-1, PAK-1,

If the team does not want 3 lettered country codes, the following process shall be used:

- The letters "SAR" will be used to replace the country code
- Followed by a number starting at 10, e.g. SAR-10 (Country 1), SAR-11 (Country)

Notes

1.5 Assessment, Search and Rescue Levels:

The key element if INSARAG Co-ordination is to clearly identify and define every level / type of work, usually needed during major USAR operation. This can range from initial assessment to the deconstruction of a building to recover the last deceased person.

The following five operational levels can define the phases of potential USAR related work. It is not necessary that all these levels will always be carried out by a single team.

Level 1:
Wide Area Assessment

Level 2:
Sector Assessment

Level 3:
Rapid Search and Rescue

Level 4:
Full search and Rescue

Level 5:
Total Coverage Search and Rescue Recovery

2

Worksite Triage

2.1 ASR Level

Notes

The objective of ASR 2 Worksite Assessment is to assess collapsed structures and identify viable sites for live rescues. The UCC will use this information to list sites in order of priority and decide which teams to assign to which sites. One of the considerations for the prioritisation of worksites is the triage category.

The objective of a triage process is to evaluate triage factors to compare collapsed structures and decide the order of priority. The key to triage is consistency in the comparison of triage factor.

Triage Categories with victim information

The level of prioritisation of worksites is based on victim information: number of confirmed alive victims, number of possibilities of live victims, and if there are only dead victims in the structure. All worksites with confirmed live victims are complete before the structures with possible live victims. The worksites with the greatest number of victims are the highest priority. Buildings with dead only may be assigned to USAR Teams as part of ASR5.

In order to assist deciding which team goes to which site, the triage teams are requested to estimate how long the operations will take. The duration can only be estimated if the assessors have an idea of where the victim is located. Duration will depend on the structure, e.g., building material and size, and on equipment and expertise. The estimate should be based on general capability of a team and will always be a rough estimate. Duration estimates will allow the UCC to assign the larger teams to the move difficult or larger sites that take longer to complete. The UCC collects information on all confirmed and possible live victims. It does not collect victims on all deceased, only information that is deemed relevant.

2

Worksite Triage (Cont.)

The above triage strategy leads to following four triage categories:

Notes

THE TRIAGE CATEGORIES

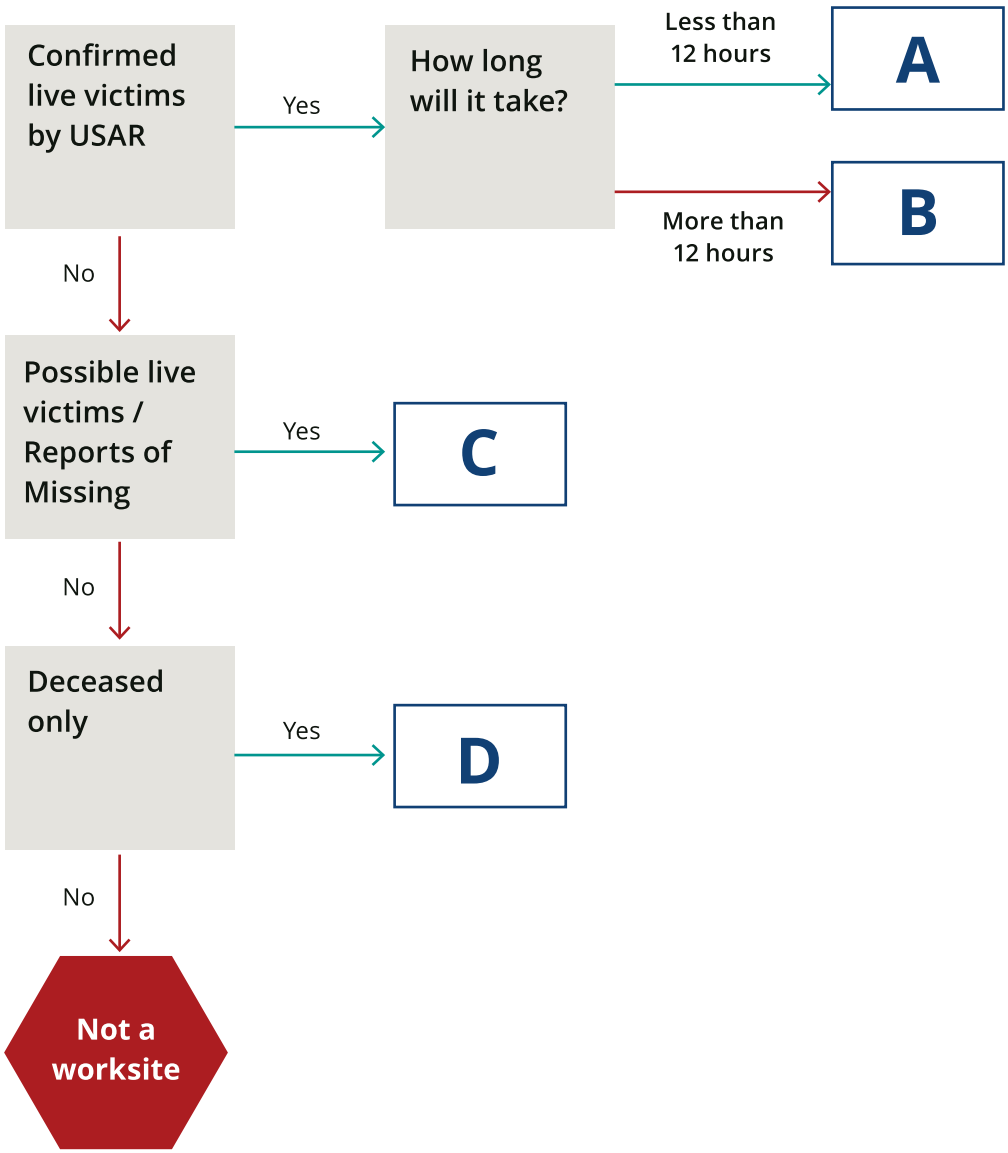
Triage Categories	Expected Duration of Operation	Expected Duration of Operation
A	Confirmed live victims	Less than 12 hours
B	Confirmed live victims	Longer than 12 hours
C	Possible live victims	Not assessed
D	Deceased only	Not assessed

- **Confirmed live victims:** Means that the USAR assessment team knows that there are people alive in the collapsed structure.
- **Possible live victims:** Means that there is a possibility that people are alive in the structure, but the assessment team cannot confirm whether people are alive or even in the structure. Examples of possible live victims is when by-standers report missing people, or a collapse of a school that was in session.
- **Deceased only:** Means that there are not live victims, but the LEMA may want to send teams to the site to recover the bodies.

2

Worksite Triage
(Cont.)

SECTOR ASSESSMENT
WORKSITE TRIAGE CATEGORY FLOWCHART



Notes

3

Factors in Worksite Triage

When performing structural triage, it is necessary to gather as much information as possible. The following factors must be considered:

- _____

  _____

- Type of structure

  _____

- _____ of the structure

  _____

- Mechanism of collapse

  _____

- _____ , _____and _____ of collapse

  _____

- Prior intelligence

  _____

- Availability of resources

  _____

- Location of utility shut-offs

  _____

- Possible presence of _____ , _____

  _____

Notes

4

INSARAG Marking System

Notes

The International Search and Rescue Advisory Group (INSARAG) Marking System uses _____ to _____ the condition of structures, the presence of hazards and the status of victims in a standardized, simple and clear fashion that can be understood by _____ local, national and international rescue personnel. The INSARAG Marking System consists of three principle Marking elements, these being: **Worksite Marking, Victim Marking and Rapid Clearance Marking.**

All markings must be conspicuous, using a high-contrast, durable, fluorescent colour.

4.1 Marking System Information Categories

The CSSR marking system can be divided into the following eight categories:

4.1.1 General Area Marking

4.1.2 Structure Orientation

4.1.3 Cordon Markings

4.1.4 Worksite Marking

4.1.5 Victim Marking

4.1.6 Rapid Clearance Marking (RCM)

4.1.7 Facilities and Vehicle Markings

4.1.8 Team and Function Markings

Notes

4.1.1 General Area Marking

At times some general marking will be required to be applied to assist in navigation and coordination. This should be limited to essential information only and be as concise as possible.

- General area marking can be applied using spray paint, builders crayon, stickers, waterproof card etc. as determined by the team.
- The colour should be highly visible and contrasting to the background.
- It may include:
  - Address or physical location
  - Landmark or code name (e.g. sugar factory building 1)
  - Assigned area or worksites are to be identified individually (see Worksite Marking)

Street & Number Identification

INSARAG Marking System (Cont.)

Notes

4.1.2 Structure Orientation

Structure orientation includes both an exterior and interior identification:

- **Exterior Identification**:
  The street address side (FRONT) of the structure shall be defined as "1". Other sides of the structure shall be assigned numerically in a clockwise manner from "1" (see graphic).

- **Interior Identification**:
  The interior of the structure will be divided into QUADRANTS. The quadrants shall be identified ALPHABETICALLY in a clockwise manner starting at the corner where Side 1 (FRONT) and 2 meet. Quadrant E (central lobby, elevators, staircases, etc) applies to buildings with multiple storeys. (See graphic).

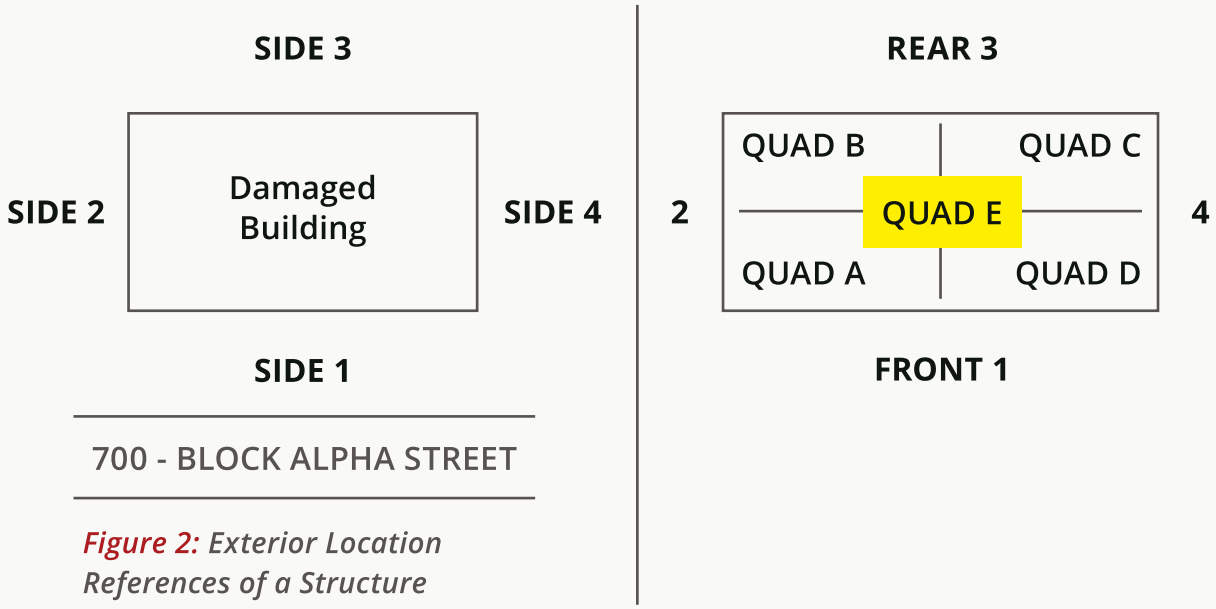


Figure 2: Exterior Location References of a Structure

4

INSARAG Marking System (Cont.)

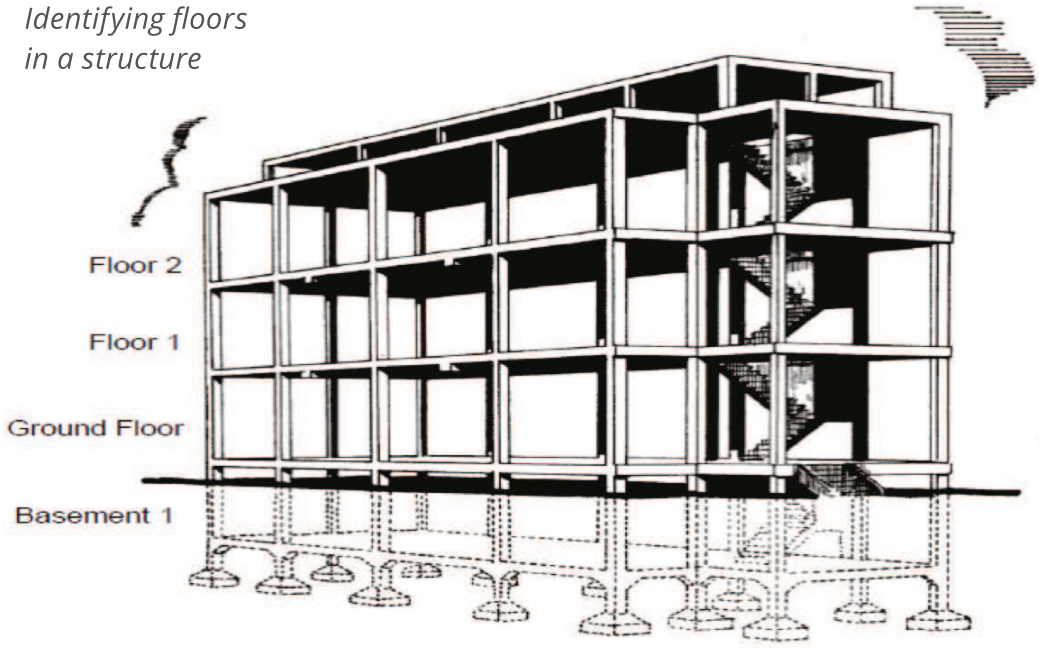
Notes

- **Identifying Floors**

  Multi-story structures must have each floor clearly identified. If not clearly identifiable, floors should be numbered in relation to ground level. The **grade-level** floor is designated as the **ground** floor. The floors above are numbered as **Floor 1, Floor 2**, etc. Conversely, the floors below the ground floor are **Basement 1, Basement 2**, etc. If possible, floors should be permanently marked at each landing of accessible stairways. If not obvious, floor should be numbered as viewed from the exterior

  Refer to Figure 4.

Figure 4:
Identifying floors in a structure



INSARAG Marking System (Cont.)

Notes

- Identifying Columns (Pillars)

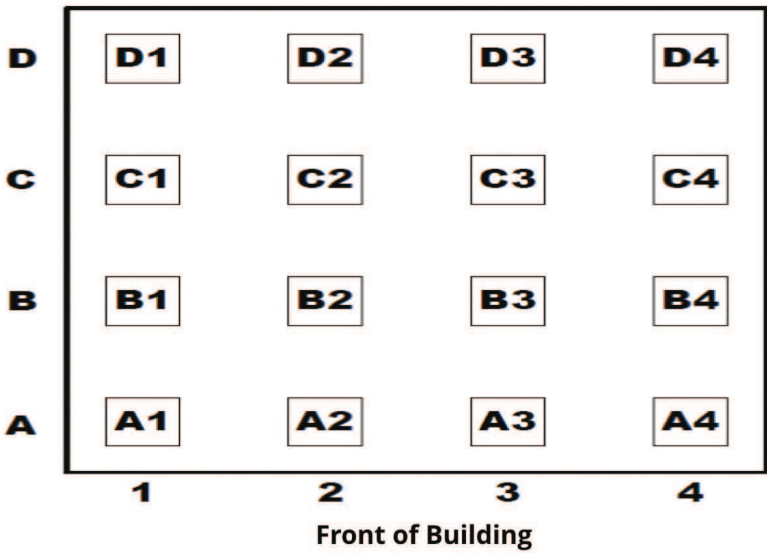


Figure 5 Identifying columns in a structure

4.1.3 Cordon Markings

Cordon markings are used to identify operational work zones as well as hazardous areas in order to restrict access and warn of dangers.

Operational Work Zone

Figure: Operational Work Zone

Exclusion Zone

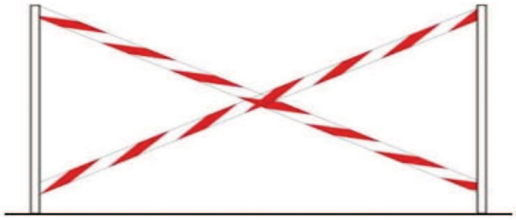


Figure: Exclusion Zone

Notes

4.1.4 Worksite Triage Marking

Worksite marking is intended to uniquely identify specific and potential live rescue sites and is therefore an essential part of the coordination system. It displays critical information and is simple to understand and apply. It allows Worksites to be easily recognized and 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.

Marking Method

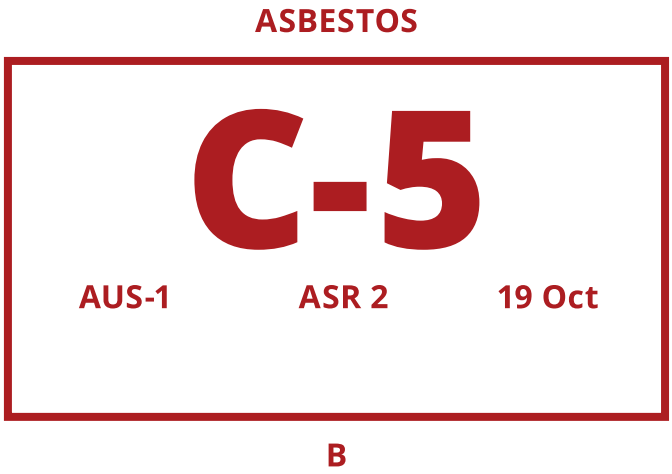
The marking should be applied to the front, (or as close as possible) or main entry to the worksite. The following method should be used when applying worksite marking:

- Draw a 1.2 meter x 1.0 meter (approximately) box.
- May draw a directional arrow to confirm exact location of worksite/worksite entry.
- Inside box – displays:
  - Worksite ID
  - Team ID
  - ASR Level completed
  - Date.
- Outside of box – displays:
  - Any hazard requiring identification e.g. Asbestos (top).
  - Triage category (bottom).
- Updated with Team ID, ASR Level completed and date as further levels of work (ASR) are completed.

Notes

- Updated missing persons, victims rescued and deceased victims extricated as these occur.
- Material used can be spray paint, builders crayon, stickers, waterproof card etc. as determined by the team.
- The Worksite ID should be approximately 40 cm high.
- The Team ID, ASR Level and date should be smaller, e.g. approximately 10cm.
- The color should be highly visible and contrasting to the background.
- After all work on the worksite has been completed and it is determined no further work is required a horizontal line is to be drawn through the centre of the entire worksite marking.

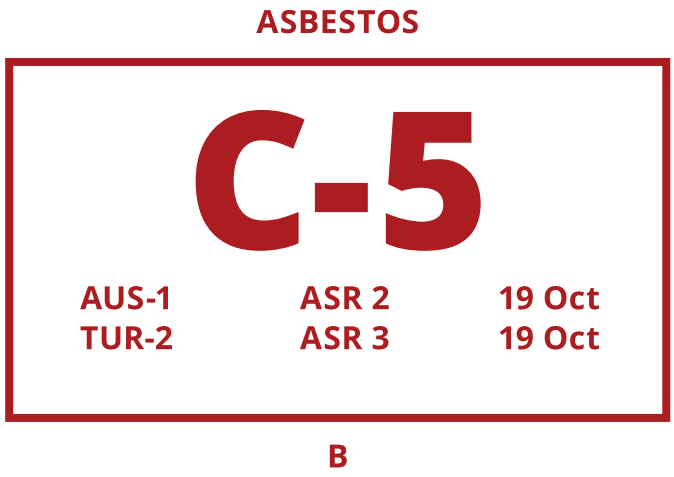
Progressive Examples



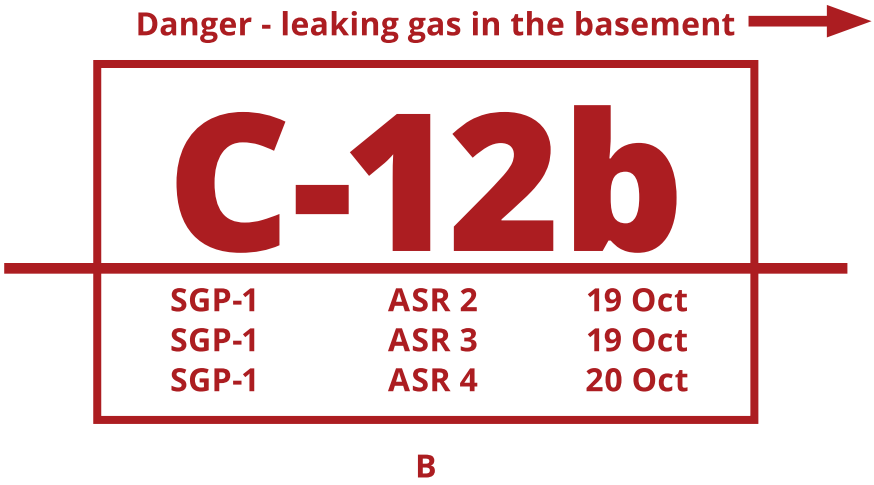
▲ **Above**: Charlie Sector, Worksite 5, Australia 1 completed ASR 2 Sector Assessment on 19th October. Asbestos was identified as a hazard. Triage category determined as "B".

4

INSARAG Marking System (Cont.)

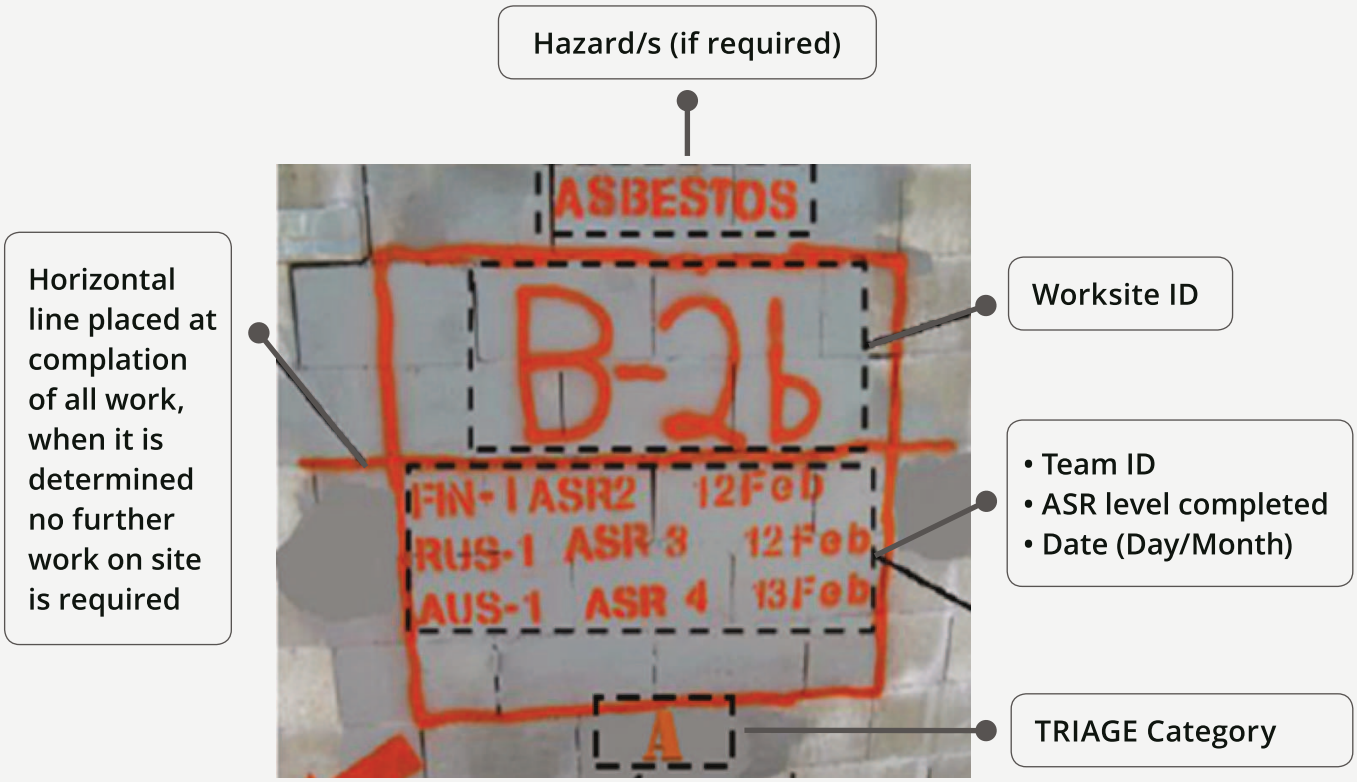


▲ **Above**: Here the Turkey 2 team were assigned to rescue operations on the C5 Worksite following the Sector Assessment completed by Australia 1. Turkey 1 completed ASR 3 Rapid SAR operations on 19th October.



▲ **Above**: Here the Singapore 1 team has completed work at the specific Worksite C-12b within Worksite C-12. An arrow has been added to the marking to make it clear that C-12b is to the right of the marking. A hazard warning about gas leaking into the basement has been added in plain language. Triage category determined as "B". Operations to ASR 2 and ASR 3 were completed on 19th October. Operations to ASR 4 Full SAR were completed on 20th October. No further operations are required on this worksite. Marking has been updated with horizontal line through the centre.

Notes



4.1.5 Victim Marking

Victim marking is required to identify potential or known casualty (Live or Dead) locations that are not obvious to rescuers e.g. below debris/entombed.

Method

The following method should be used when applying victim marking:

- When teams (e.g. Search teams) are not remaining on site to immediately commence operations.
- At incidents involving multiple casualties or where any confusion on exact location from search operations is possible.
- Markings are done as close as physically possible to the actual surface point identified as the location of the casualty.
- Material used can be spray paint, builder's crayon, stickers, waterproof card etc. as determined by the team.
- The size should approximately 50cm.

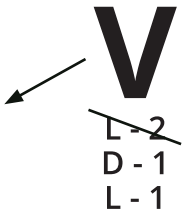
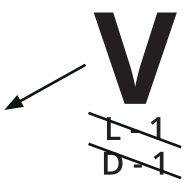
Notes

INSARAG Marking System (Cont.)

- The color should be highly visible and contrasting to the background.
- Not intended for use when rescue operations are completed.
- Not to be applied to the front of a structure with the Worksite ID unless that is where the casualties are located.

Notes

Progressive Examples

Description	Example
Large **"V"** applied to location of all potential victims – live or deceased.	
Optional arrow from **"V"** to clarify location if required.	
Under the **"V"** either: • An **"L"** indicating confirmed live victim, followed by a number (e.g. **"2"**) indicating the number of live victims at that location – **"L-2"**, **"L-3"** etc. and/or • A **"D"** indicating confirmed deceased victim, followed by a number (e.g. **"3"**) indicating the number of deceased victims at that location – **"D-3"**, **"D-4"** etc.	 
On removal of any casualty the relevant marking is crossed out and updated (if required) below; e.g. **"L-2"** may be crossed out and an **"L-1"** applied indicating only one Live victim remaining.	
When all **"L"** and/or **"D"** markings are crossed out, all known victims have been removed.	

INSARAG Marking System (Cont.)

4.1.6 Rapid Clearance Marking (RCM)

The Worksite ID system is only used at potential live rescue sites, with other sites, where no rescues are possible, or required normally remaining unmarked. This allows teams to move faster, maximize life-saving opportunities and simplifies coordination. However there are situations where it is beneficial to have a marking that can be left at sites where teams have established there are no live victims or 'deceased' only. Leaving a recognized **'clear'** marking will prevent duplication and have other advantages. When it is decided this level of coordination and marking is necessary the Rapid Clearance Marking (RCM) system can be used.

Method

The process for applying RCM is as follows:

- Decision for RCM marking
- RCM can only be used when sites can be fully searched quickly or there is strong evidence confirming no live rescues are possible.
- Two RCM marking options are available, they are: Clear and Deceased Only.

	**Clear:** Equivalent to ASR Level 5 search completion – indicating that the area/structure is clear of all Live and Deceased casualties.
	**Deceased Only:** Indicates same level of comprehensive search has been completed but only **Deceased Casualties** remain in-situ. **Note:** When deceased are removed, apply "clear" RCM adjacent to original mark.

Notes

4

INSARAG Marking System (Cont.)

- Can be applied to structures that are able to be searched rapidly or where information confirms there are no live victims or only deceased remain.
- Can be applied to non-structural areas – cars/objects/outbuildings/debris piles etc. – that have been searched to standards indicated above.
- Applied in the most visible/logical position on the object/area to provide the greatest visual impact.
- Diamond shape with a large "C" inside for "Clear," or with a large "D" inside for "Deceased Only." Immediately below, the following is applied:
  (1) Team ID: _ _ _-_ _ e.g. AUS-01.
  (2) Date of Search: _ _/ _ _ _ e.g. 19/Oct.
  (3) Material to be used can be spray paint, builders' crayon, stickers, waterproof card etc. at the discretion of the teams.
  (4) Size: Approximately 20 cm x 20 cm.
  (5) Colour: Bright, contrasting colour to background.

Notes

Progressive Examples

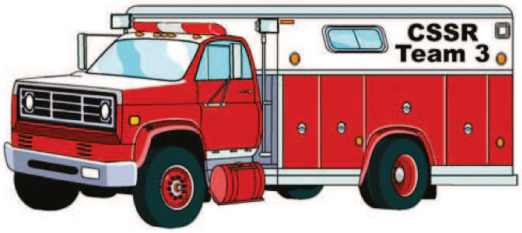
EXAMPLES	
Rapid clearance marking indicating Level 5 ASR complete on object/area applied. Applied by Australian Taskforce 1 on 7 July.	 AUS – 1 07 Jul
Rapid clearance marking indicating comprehensive search complete on object/area applied, only deceased casualties remain in-situ. Victim Marking would be applied as required. Applied by Australian Taskforce 1 on 7 July.	 AUS – 1 07 Jul

Notes

4.1.7 Facilities and Vehicle Markings

Facilities: Iconic flags banners, balloons, or other must be used to identify the team, team medical facility, the Command Post, etc.

Vehicles: Vehicles must be marked with team name and function by a flag, magnetic sign, etc.



4.1.8 Team and Function Markings

The following information must be clearly displayed on all emergency personnel:

- Response team identity (country and team name) by uniform, patch, etc.
- Personnel positions must be color-coded and labeled in **English** plain text (using vests, arm bands, helmets, etc.), as follows:
  - Management position(s): white
  - Medical position(s): red cross/crescent
  - Safety/security position(s): orange

Table Top Exercise

Scenario:

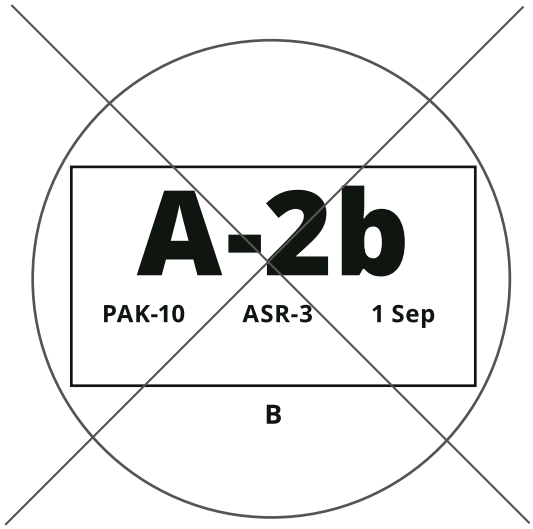
Today is September 1 and is 7 AM.
Your SAR team PAK-10, begins search and rescue operations SAR level 3 at work site A-2b.
You received information from OSOCC that there are 12 confirmed live victims in your assigned working site.

You concluded your operation on September 1 at 6:15 PM.

Answer:

Instruction:

Ask participants to identify the error/s in the markings illustrated below.



Answer:

POST-TEST | LESSON 4

Structural Triage and the Insarag Marking System

ID #

1. **Define structural triage.**

   A _____ assessment of buildings during a CSSR operation, for the purpose of _____ those structures in which there is a greater likelihood of finding, accessing, and _____ victims.

2. **In the following list, mark the items that are considered to be among the basic rules for structural triage:**

   ( ) Search and rescue operations can only begin after triage is completed and priorities are established.

   ( ) Structural triage is conducted initially by local residents.

   ( ) Triage may be re-evaluated once live victims are found.

   ( ) Structural triage is performed when three or more structures are assigned to a single CSSR squad.

   ( ) Structural triage should take no more than 15 minutes per building or structure.

   ( ) The objective is to recover bodies during the search for victims.

3. **Complete the following list of factors to consider in structural triage:**

   Type of structure

   _____

   Mechanism of collapse

   _____

   Prior intelligence

   _____

   Location of utility shut-offs

   Possible presence of hazardous materials

4. **INSARAG is the acronym for the International Search and Rescue Advisory Group. The INSARAG Marking System was established for what purpose?**

_____

_____

_____

5. **Match each marking type in the list with the graphics below. Write the corresponding number (circled) in the corresponding space.**

____ for marking vehicles and installations

____ for identifying personnel and team member functions

____ for marking general hazards

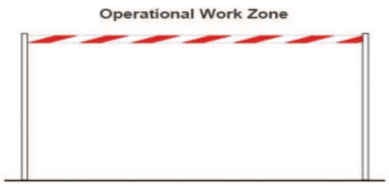
____ for marking work sites and assigned areas

____ for marking structural evaluation and victim location

01

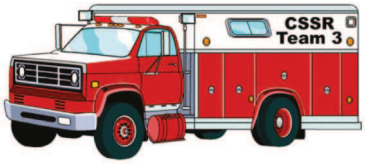
02

03



04

05



CSSR LESSON 4 EVALUATION

Course Location: _____ **Dates:** _____

Do not write your name on this form. Please complete a copy of this form at the end of every lesson. Your evaluations are very valuable towards improving the course. Please use the ratings below.

1 VERY POOR	2 POOR	3 AVERAGE	4 GOOD	5 EXCELLENT

Please fill in the required information.	**Lesson Number :**	**Lesson Name :**	
	Instructor's Name		
Use a scale from 1 to 5 as described above to rate the various lesson components.	**Lesson Rating (rate 1 to 5)**		
	Content	Instructor	Method
	Workbook	Interaction	
Mark your selection with an "**X**"	**Instruction Level**		
	☐ Too basic	☐ Appropriate	☐ Too advanced
	Duration		
	☐ Too short	☐ Appropriate	☐ Too long
	Usefulness Was this lesson useful to you?		
		☐ Yes	☐ No
Rate from 1 to 5	**Overall Lesson Rating** Taking all the above into consideration, I rate this lesson: _____		
If you need additional space, please use the back of the sheet.	**Comments and Observations**		

Thank you for your help. Your input is valuable. Please turn in this completed form to the instructor.