IRATA International Code of Practice for Industrial Rope Access

Part 3: Informative Annexes

Annex R: Rescue and Evacuation Planning, and Considerations

1 INTRODUCTION

This annex provides information and guidance regarding the provision, planning, management, documenting and successful implementation of an industrial rope access Rescue and Evacuation, which includes access and egress. The principles within this annex may also be applied to planning Rescues for alternative work at height operations.

In the UK, planning for Rescue and Evacuation is a legal requirement within the 'Work at Height regulations 2005'. This requirement is also mandatory in international standards such as ANSI/ASSP Z359.2-2023 and other regional standards.

Industrial rope access operations and Rescues must be planned prior to commencing any rope access works. The need to carry out a Rescue or Evacuation during rope access operations can result from an unintended event or accident, and therefore effective rescue planning for such occurrences is essential to enable a successful Rescue or Evacuation. It is further recommended that if rope access technicians know and understand the rescue plan, before commencing any rope access activities, this should increase the likelihood of a successful Rescue or Evacuation.

Note: For those who are not employed for the provision of Rescue, the application of rope access rescue techniques learnt during training can be infrequent and relatively unpractised. These factors, in combination with Rescues being rarely required in industrial rope access operational work and the potential lack of ongoing training and experience in Rescues and Evacuations, can significantly impact the effectiveness of a Rescue. Consequently, it is recommended that Rescue drills are practiced prior to starting any rope access operational activities.

Note: The information provided within this annex is intended as guidance and is not exhaustive.

Note: It is a requirement within the 'IRATA Bye-Laws' [QP-103ENG] to report incidents to IRATA which have resulted in a Rescue being required.

1.1 Scope

The initial evaluation of intended rope access operations is important to identify which stages of work may require a Rescue or Evacuation. For example, are there hazards present during access and egress that would require an additional rescue plan to be in place and implemented to get an incapacitated technician to a Safe Zone? Taking this into consideration, this annex is intended to assist with rescue planning for 'reasonably foreseeable' Rescues at all operational stages.

2 TERMS, DEFINITIONS & ABBREVIATIONS

BMU	Building Maintenance Unit
Casualty	person requiring Rescue
Collective Protection Measures	(sometimes referred to as 'passive') are protective measures that involve the use of equipment, (e.g. guard rails and air bags) to prevent or mitigate a fall from height and do not rely on Personal Protection Equipment (PPE) to ensure a safe system of work
Evacuation	a planned process for moving individuals from a dangerous area to a specified area of safety
Ground Controlling	a method whereby applying more friction from below to the working line slows the decent during Rescue and/or using the working lines to assist in moving a Casualty to a better landing zone
Hierarchy	the system or organisation in which the method for decision making is ranked from the most, to the least preferrable option
Intervention Rescue	a person to person Rescue that requires physical contact and connection
MEWP	Mobile Elevated Work Platform
PFPE	Personal Fall Protection Equipment
PPE	Personal Protective Equipment
Safe Zone	designated area of safety to move a Casualty to for the emergency services to takeover
Sentries	team members placed within or at exclusion zones to control third party movement
Releasable Rigging	the process of rigging a working and safety line through devices (usually suitable descenders) that allow for an operative attached to the lines to be raised or lowered using these devices
Rescue	the act of saving or being saved from danger or difficulty
Remote Rescue	no requirement for a person to physically contact or connect to the Casualty to move them to a Safe Zone
Rigging for Rescue	establishing a Remote Rescue system that enables workmate retrieval to take place without the need for a rescuer to descend or ascend to the rescue location
Worksite	the area where rope access operational work is to be undertaken

R.1 Information

'ICOP' 1.4.2.7.2 - *"A rope access technician should endeavour always to be in a position such that, in the event of an incident, they would be able to Rescue themself, or to be Rescued quickly and efficiently by the work team or by a dedicated on-site rescue team."*

When planning a Rescue, techniques that allow for a Remote Rescue should be considered for use first. Preference should be given to 'simple' Rescue options for both 'on' and 'off' rope requirements, followed by non-intervention 'Rigging for Rescue'/'Releasable Rigging' techniques. These techniques should be considered as the preferred options as they allow the Casualty to be brought to the Safe Zone, without the requirement for a rescuer to access the Casualty.

Note: Rope-based rescue techniques are utilised in all manner of scenarios such as mountains, mines, cliffs and the built environment. However, when these rescue techniques are used in emergency situations by specialised emergency rescue teams, they may not have the benefit of the forward planning that must be applied to industrial rope access operational work. Because of this, specialised emergency rescue teams undergo extensive rescue training to adapt their skills and knowledge, to enable an effective Rescue in various dynamic, unplanned and unknown situations.

R.2 The Rescue Plan

Within this annex is an example of a 'Industrial Rope Access Rescue Plan' [TP-374] template, that includes the potential considerations (see Sections R.3 to R.15 for more information) to be made when planning a Rescue and completing a rescue plan.

The potential considerations listed within this annex are non-exhaustive, and the rescue planner should utilise their training, experience and knowledge to plan for 'reasonably foreseeable' rescues at all operational stages.

R.3 Site Details

A rescue plan should contain enough information regarding the rope access operational site to ensure that in the event of an emergency:

- The site location and details can be communicated effectively to those who may be unfamiliar with the area.
- A site Evacuation can be effectively executed. It is common for rope access operations to be conducted in areas that present additional challenges to a site Evacuation. An Evacuation may be entirely different to a Rescue as it involves the entire on-site rope access team being able to get to an area of safety.
- There is an awareness of where the Safety Zone(s) is located.
- Any specialist site access requirements are or have been communicated to the emergency services, such as the requirement for a 4-wheel drive vehicle, key codes or access through locked gates/doors and the presence of restricted spaces.
- Any Worksite specific procedures are known e.g. contacting site security who will liaise with the emergency services.

*Note: Technicians are often in areas which may not have been considered when planning a standard Evacuation. Consideration should be given to evacuating **all** team members to an area of safety, not just those on-rope.*

R.4 Designated Safe Zone

Safety Zone(s) details should be documented within the rescue plan. There may be multiple designated Safety Zones depending on the type of operations being conducted and the environment, however, it is important that the Safe Zone is clearly defined and known by all involved.

Any changes to the Safe Zone should be documented in the rescue plan and communicated to all involved.

R.5 Task Description

The method statement or equivalent should contain information on the operational tasks to be undertaken. It is important to include information in the rescue plan regarding aspects which may impede or affect a Rescue, such as:

- Equipment being used during hazardous operations, which may require isolations or other forms of control or mitigation.
- The identification of all exclusion zones, and how they will be utilised during a Rescue.
- The requirement for Sentries in different areas and their potential role in assisting Rescues.
- The potential risks introduced to others such as the public by repositioning Sentries during a Rescue, e.g. having to leave an exclusion zone unattended.
- The potential for other activities such as Evacuations, or lock outs/lock downs to affect a Rescue.
- The requirement and positioning of rope protection/edge management for both operational work and during a Rescue.

R.6 Access to and Egress from Worksite

The requirement for a Rescue or Evacuation may occur on the access or egress route to the Worksite. As rope access operational work is frequently accessed through areas utilising work at height access methods, this would require a rescue plan that incorporates any complications from those access methods and any rescue requirements resulting from:

- Access to the working area, e.g. ladders fixed or otherwise, access hatches onto roof tops and/or plant rooms.
- Any safety systems to be used to access the work site, e.g. temporary or permanent vertical/horizontal fall arrest and/or restraint systems.
- Collective Protection Measures used at the Worksite which may also have a rescue requirement, e.g. fall arrest nets and/or airbags.
- Confined or restrictive spaces which are, or maybe encountered during access and egress, or any potential Rescue or Evacuation, this includes the suitability of rescue equipment, e.g. stretchers and Evacuation chairs.

R.7 Identification and Evaluation of Potential Rescue Causes

Personnel
Equipment
Third party
Environment

A useful acronym when identifying and evaluating the potential causes of a Rescue is "**Rescue PETE**".

Applying the Rescue PETE principles enables a rescue planner to consider the various potential causes of an incident that may require a Rescue.

Personnel – Personnel considerations should be evaluated, and a rescue plan prepared based upon a Casualty being incapacitated or immobile. Assuming this may provide a useful baseline as it assists with planning for 'worst-case scenarios'. It can also be difficult to Rescue Casualties who are distressed or panicked, and a relatively simple Rescue can be complicated by the Casualty attaching themselves to a structure or object in panic.

Key personnel considerations include:

- Illness
- Injury
- Incapacitation
- Distress
- Inability (e.g. technical)
- Fatigue
- Multiple Casualties
- Uncooperative Casualty

Equipment – Equipment should be evaluated to identify how it may cause an incident, resulting in the need for Rescue. All manner of equipment is used by technicians during rope access operational works, as well as in tandem with rope access operations. Equipment may be hazardous for technicians, rescue teams and/or third parties, and may cause damage to critical Personal Fall Protection Equipment (PFPE).

Key equipment considerations include:

- Direct injury by equipment including dropped or falling;
- Failure or malfunction of equipment;
- Mis-operation of equipment;
- The requirement for specialist equipment and Personal Protective Equipment (PPE);
- The use of equipment such as breathing apparatus or specialist clothing, may prohibit the movement, vision, or effective operation of PFPE for both Casualties and rescuers; and
- Remote shut off or isolation of equipment.

Note: Any additional PPE requirements for operational work may also be required for Rescue, e.g. equipment used operationally to protect against hot works will be required in the event of a Rescue.

The planned Rescue may not require any additional equipment to that being used operationally, e.g. a 'SR-1' (see Section R.9) may be a simple pre-rigged system allowing the Casualty to be lowered straight into a Safe Zone. This assumes that the Casualty is incapacitated, and that a Rescue is not a result of equipment failure or damage.

If specialist equipment is required and specified in the rescue plan, it is important that all those who may need to use it are competent to do so.

Note: Passive equipment such as rescue stretchers and Evacuation chairs require training and competence to be used.

Note: The use of additional equipment may be helpful if available, but may introduce risks with unplanned use.

Third Party – The actions of third parties that are not directly involved in the rope access operational works should be considered, as they may be the cause of an incident which necessitates a Rescue and/or may impede the effectiveness of a Rescue.

Key third party considerations include:

- Malicious acts, e.g. third party's interfering with and/or damaging PFPE;
- Operational cross over, e.g. a third party operating machinery involved in the rope access operation such as a crane or hoist;
- Direct action, e.g. a third party's unintentional movement of equipment, dropping objects, power or lighting shutdowns, or closing a window or door which was be intended for access and egress;
- Third party emergency procedures, e.g. smoke venting, fire doors and isolations; and
- Parallel operations e.g. welding sparks, chemical spills.

Environment – Consideration should be given to environmental hazards present or occurring within the operational environment, which necessitates a Rescue and/or may impede the effectiveness of a Rescue.

Note: Industrial rope access is utilised within (or above in the case of water) most conceivable hazardous working environments.

Key environmental considerations include:

- Weather conditions
- Structural stability
- Fragility
- Atmospheric e.g. gas, radiation, flammable and toxic)
- High voltage e.g. power lines, rail tracks and buzz bars
- Physical environment complexity
- Slippery surfaces
- Lighting and visibility
- Temperature extremes, which are not always weather related
- Works over water
- Rock fall and subsidence

Note: Environmental factors to be considered during rescue planning may be different to those considered during the planned operational works. An environmental change which triggers the suspension of work, should be factored into the rescue plan, e.g. if works are suspended because the wind speed increases to an unacceptable level, or there is a power failure and mains lighting is lost.

Note: Not all environmental changes are foreseeable, and some may result in hindrance or termination of a planned Rescue. However, the more consideration that is given to these factors at the planning stage, the greater the likelihood of an effective Rescue.

R.8 Rescue Categorisation & Types

To determine the most appropriate planned Rescue, it is recommended that the rescue is categorised according to whether it is a 'Remote Rescue' or 'Intervention Rescue,' and then the rescue type identified according to whether it is, 'simple' or 'complex', as detailed below:

Remote Rescue

A Rescue that is facilitated using rope access techniques and/or equipment and **does not** require physical contact or connection with the Casualty to move them to a Safe Zone.

Remote Rescues can be further characterised into 'Simple' and 'Complex' rescue types:

- Simple - simple lowering system, e.g. a pre-rigged system to attach to and lower a Casualty to a Safe Zone (see Section R.9, SR-1).
- Complex - hazards exist that require specialist training and/or equipment to perform an effective Rescue, e.g. Mobile Elevated Works Platforms (MEWPs), Mast climbers or powered access and Building Maintenance Units (BMUs) (see Section R.9, CR-3).

Intervention Rescue

A Rescue that is facilitated using rope access techniques and/or equipment, that **does** require physical contact or connection with the Casualty to move them to a Safe Zone.

Intervention Rescues can be further characterised into 'Simple' and 'Complex' rescue types.

- Simple - minimal amount of time, equipment, personnel and competency e.g. descent Rescue from descender separate ropes (IRATA Level 1 Rescue). See Section R.9, SI-2.
- Complex - increased requirement of technical competency, knowledge and skills (IRATA Level 2 & 3). See Section R.9, CIR-4.

Note: The categories above are based on the IRATA 'TACS' [TC-101] syllabus.

The 'Figure 1: Rescue categorisation flowchart' may be used to assist with determining the most suitable rescue categories and types.

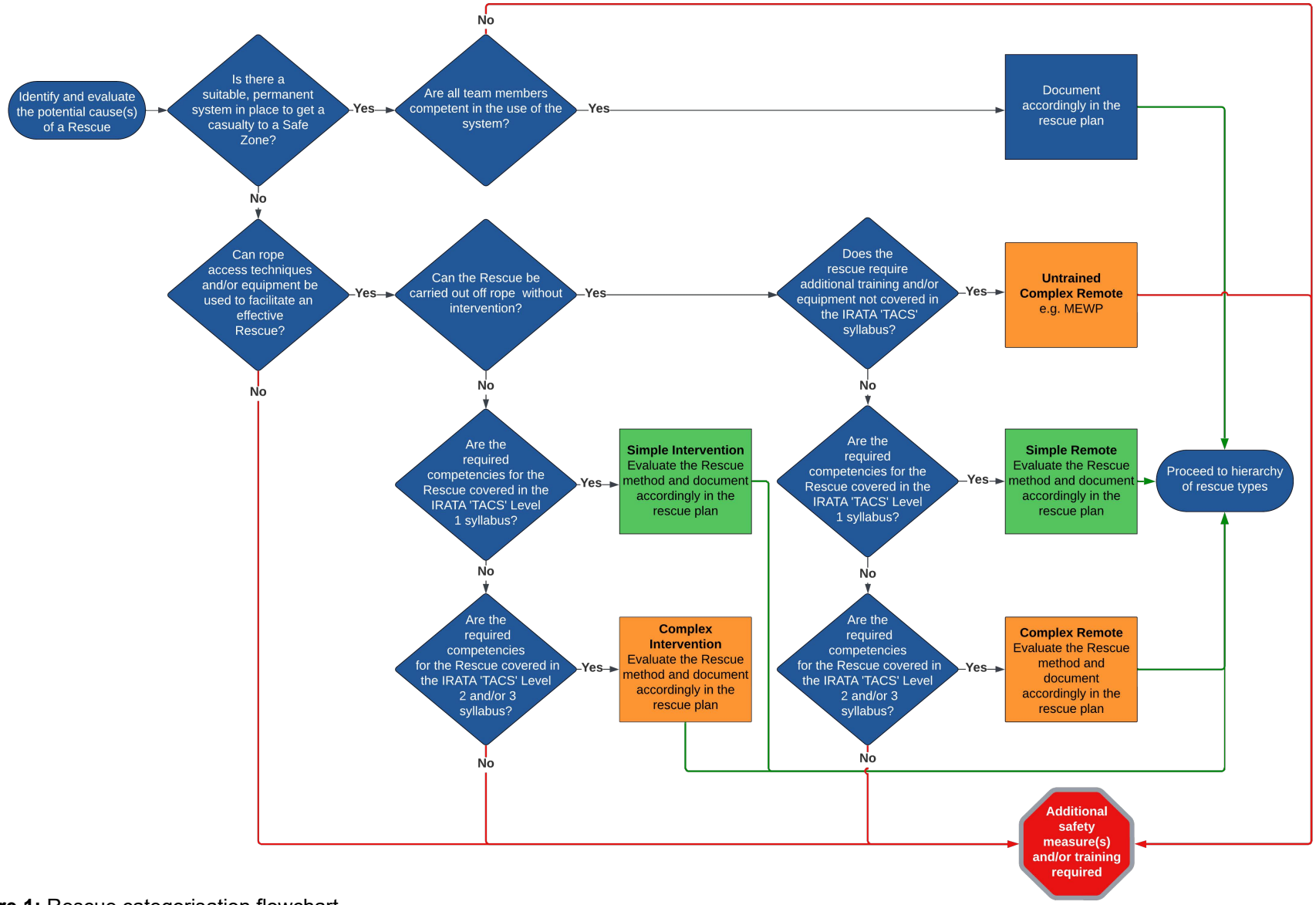

Figure 1: Rescue categorisation flowchart

R.9 Hierarchy of Rescue Types

This section details the elements to be considered when determining the Hierarchy position of the chosen rescue types.

As with the application of the 'Work at Height Hierarchy', preference should be given to the simplest rescue type which presents the lowest risk. Whilst it is not always practicable to utilise these rescue types, applying the Hierarchy to decision making during rescue planning, demonstrates that consideration has been given to the suitability of the preferred rescue type. Justification can then be provided for selecting alternative rescue types.

Note: Illustrations within this section are provided as examples of the rescue type and are not intended for training purposes or as an example of a required technique.

- **Simple Remote Rescue (SR-1)**

This Rescue utilises rigging methods and devices that allow an operative to access the working area. In the event of a Rescue a suitably trained person(s) can control the Casualty's descent to a Safe Zone.

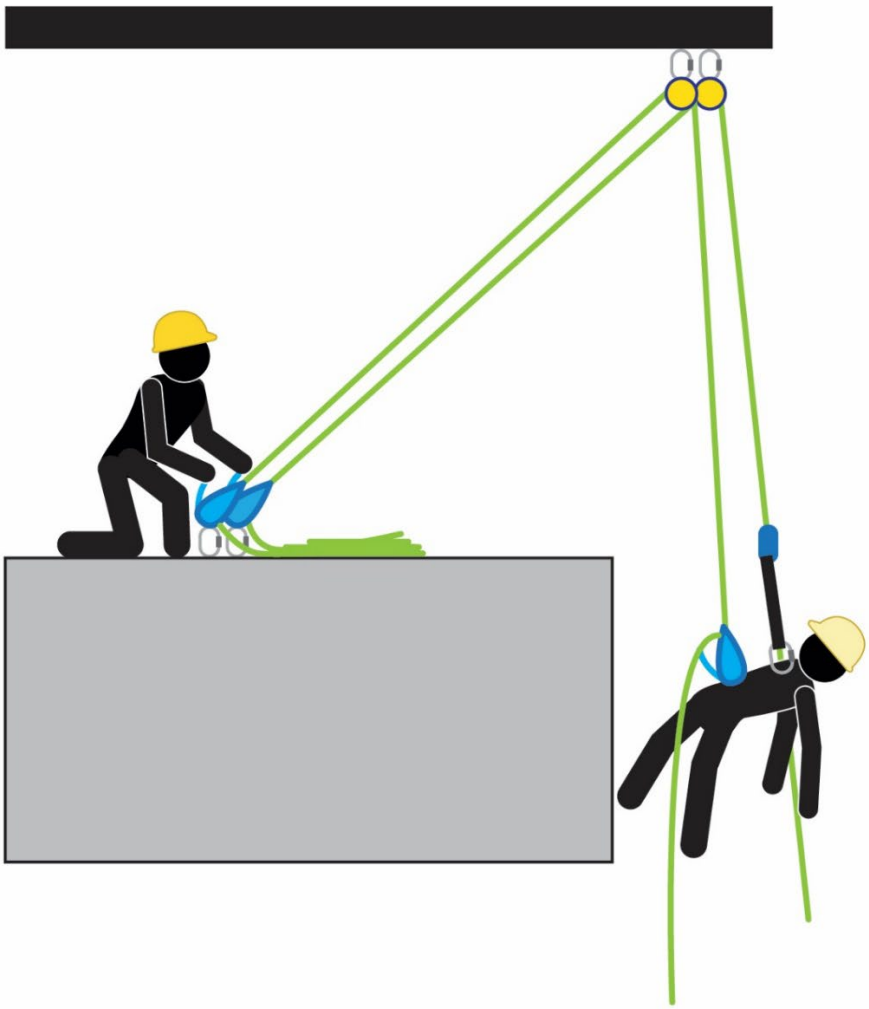

Figure 2. An illustrative example of a simple Remote Rescue

- **Simple Intervention Rescue (SI-2)**

This Rescue method allows a rescuer to access the Casualty using a separate set of ropes. The rescuer will establish suitable connection points to the Casualty before transferring either the Casualty on to the rescuer system, or the rescuer onto the Casualty's system, before descending to a Safe Zone.

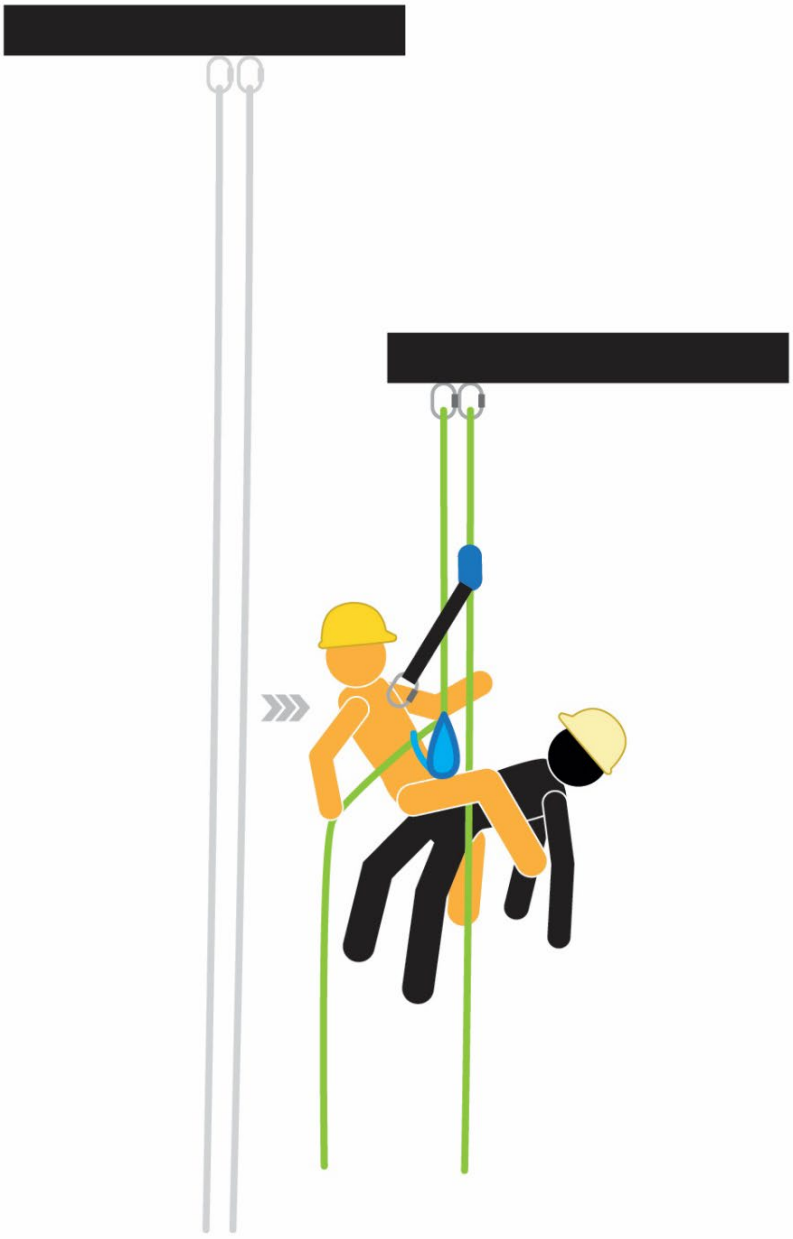

Figure 3. An illustrative example of a simple Intervention Rescue

- **Complex Remote Rescue (CR-3) – Outside of IRATA Certification**

These rescue methods utilise additional equipment and techniques to manoeuvre a Casualty to a Safe Zone, without on-rope person to person intervention.

Note: A complex Remote Rescue may be considered preferential to other rescue types as ropes are not required, however, in this Hierarchy it is not considered preferable as it does not fall within the IRATA 'TACS' [TC-101] syllabus, and therefore additional work at height training and competencies may be required for the implementation of the rescue plan outside of the IRATA 'TACS' [TC-101] syllabus.

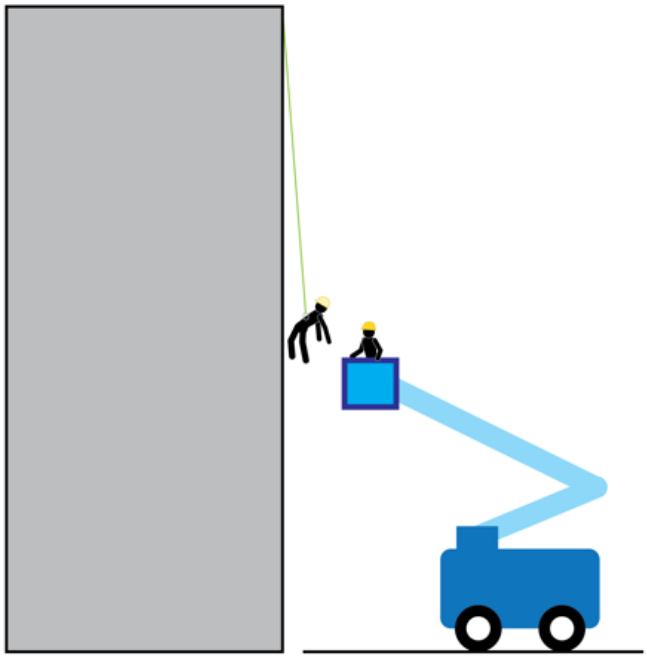

Figure 4. An illustrative example of a complex Remote Rescue using a MEWP

Figure 5. An illustrative example of a complex Remote Rescue using a remotely operated winch

- **Complex Intervention Rescue (CIR-4)**

In this Rescue scenario the rescuer uses the existing rigging to access the Casualty, then uses additional equipment and techniques to manoeuvre the Casualty to the Safe Zone.

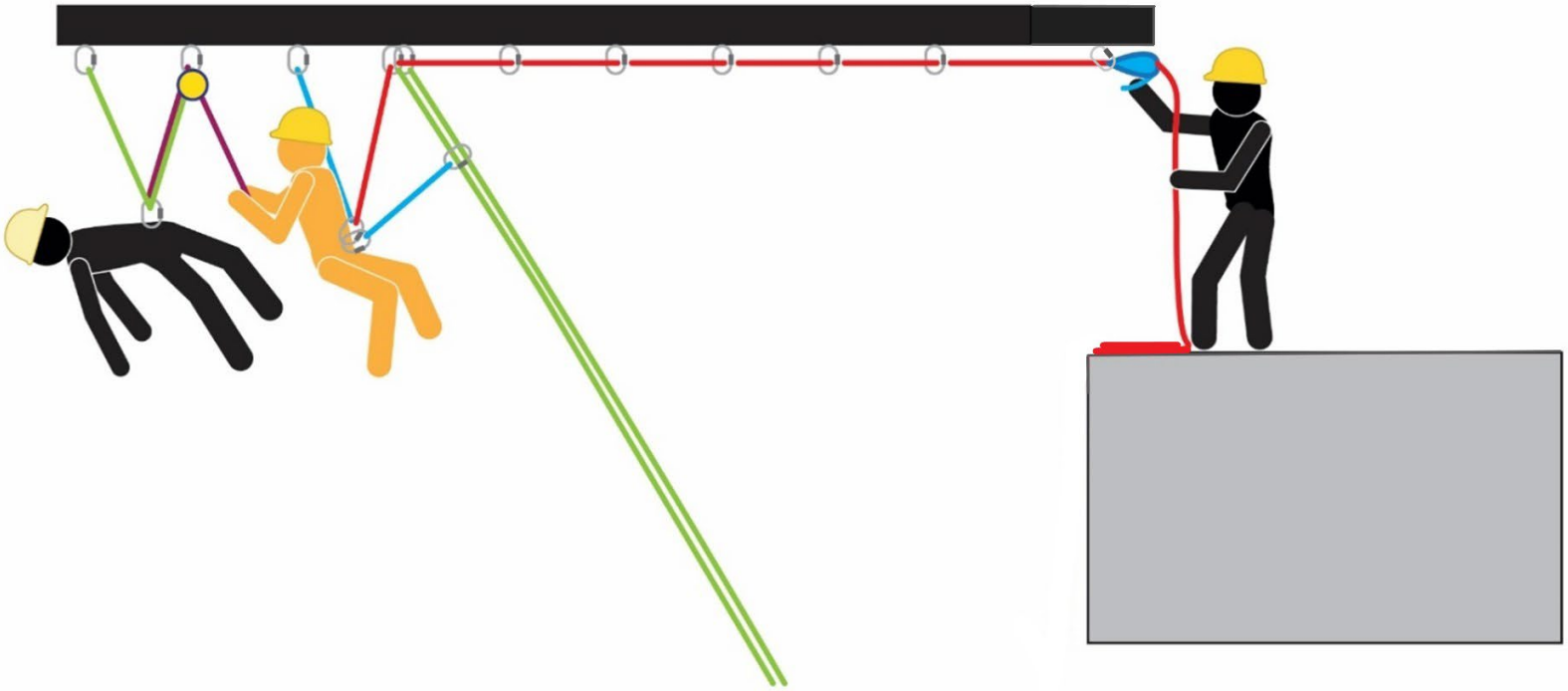

Figure 6. An illustrative example of a complex Intervention Rescue

R.10 Rescue Procedure

The rescue procedure should contain clear instructions detailing the rescue method to be used and under what circumstances. The procedure should be understood by all persons required for the Rescue. Diagrams and images may be useful for providing clarity.

Team Requirements

Knowing the type of rescue provides information that assists with determining rescue team requirements e.g. competencies and resources.

- **Team Competency** - Competency requirements can be ascertained by reviewing the techniques and equipment that are required to carry out the Rescue. The required techniques may be simple as per an IRATA Level 1 Rescue, or more complex as per an IRATA Level 3 Rescue. If the rescue plan utilises rescues techniques taught as per the IRATA 'TACS' [TC-101] syllabus, then an IRATA technician's certification level is a good indication of previous training and some experience. This may be a suitable starting point for the allocation of roles and responsibilities within the rescue team.

- **Personnel Resource** - When determining the team size, the rescue planner should consider all team members and their roles and responsibilities. An example of this would be an 'SR-1' Rescue (see 'R9 Hierarchy of Rescue Types'), which may only require a second technician to lower a Casualty into a Safe Zone below, but circumstances may also require a third person to manage the Casualty at ground level.

Note: Whilst an SR-1 Rescue may be preferred as no intervention is required, Casualty management may be difficult for a two-person team and therefore, careful evaluation of resource is required.

R.11 Roles and Responsibilities

Assigning roles and responsibilities to rescue team members is important to minimise confusion in the event of a Rescue. The more complex the planned Rescue, the greater the need for clearly defined roles and responsibilities. It is important to be aware that a technically simple Rescue may be more complex due to other considerations such as weather, access and location.

It may be useful to define the following roles and responsibilities:
- Rescue Team Supervisor(s)
- Rescuer(s)
- Equipment Operator(s)
- Sentries
- Person(s) responsible for emergency communication
- First Aider(s)

Note: A two-person team may be working in tandem with a rescue plan in place, to enable them to rescue each other, if required.

R.12 Communication Roles and Types

Establishing methods of communication for Rescues is essential for minimising confusion and delays.

Communication types may be separated into primary, secondary and tertiary if required:

Primary direct verbal or non-verbal communication between the rescue team during a Rescue, which may involve the use of radios and hand signals.

Secondary communication between site personnel that are not directly involved in the Rescue, and the emergency services (if required).

Tertiary direct communication between the rescue team and the emergency services during a Rescue.

R.13 Designated Anchors

When planning a Rescue consideration should be made regarding the anchors to be used. The anchors may already be established for the rope access operation or may require installation. In such instances installed anchors should only be used as specified in the rescue plan.

Note: If different anchors are required for work and Rescue, this should be highlighted within a rigging plan.

When planning a Rescue, consideration should be given to the potential change in loadings and anchor related issues that may occur during a Rescue. Consideration should be made for:

- Increased loading on anchors for a two-person Rescue.
- Increased loading on a tensioned system e.g. a directional tensioned line, being used to direct a Casualty and potentially a rescuer, to the Safe Zone.
- Deployed fall arrest anchors and devices e.g. some fall arrest posts may be used as rescue anchors after deployment.
- Suitability of temporary anchor systems for Rescue, e.g. using a weighted davit arm or trolley, which should be rated for a two-person Rescue load if required.
- Increased friction loads e.g. lowering or raising a Casualty over an edge with appropriate rope protection/edge management in place.
- The need for Ground Controlling.
- Location of anchors in relation to the most effective rescue method, e.g. rigging a second set of ropes to move a Casualty effectively to a Safe Zone.

R.14 First Aid Provision

First aid requirements must be identified in a first aid needs analysis. This ensures that adequate first aid provisions are available in terms of the required competent personnel, resources and equipment.

First aid requirements may vary depending on factors, such as the remoteness of the location and the complexity of access and egress. For example, the requirement for first aid training, certification and equipment for a team working in a remote location with complex access, would be greater than that of a team working on a simple task, which is easily and quickly accessible by the emergency services.

When carrying out a first aid needs analysis, the following should be considered:

- The operation being carried out e.g. hot works would require specific first aid kits.
- Working in remote and complex locations may increase the competency requirement of on-site First Aiders to a higher level.
- First aid kits:
  - Are personal on harness first aid kits required?
  - Are team kits suitable if available at the Worksite?
  - Do first aid kits need to be available in more than one location?
- How many first aiders are required in the team? For example, a potential hazard would be a small team, where the only First Aider is carrying out the operational works and is putting themselves at a greater risk of requiring Rescue and potential first aid.

R.15 Other Considerations

R.15.1 Rescue Preparation

Whilst it may be very unlikely that a Rescue will be required, ensuring the rescue team and all involved are prepared in advance, may be critical to its effectiveness. For example, the time taken to locate equipment and put on harnesses may be valuable time wasted in the event of a Rescue and this may lead to confusion and mistakes. Rescue drills and demonstrations can be beneficial in ensuring each team member is confident in what is required of them, this is especially relevant for complex Rescue scenarios.

*Note: During operational works the rescue team should always be prepared e.g. if **all** the required team members are unavailable, then operations should cease and the Recue plan should be updated accordingly. An accident may occur at any time, which requires a swift planned response. All rescue team members must be prepared and ready to act, continuously throughout the full period of operations.*

R.15.2 Deviation from the Rescue Plan

Rope access operational work may be subject to change due to weather conditions, resource or environmental changes etc. In such instances, the likelihood of a Rescue being required may remain unchanged, but the likelihood of a Rescue being effective may decrease significantly.

Note: It is important to remember that if on site changes will affect a rescue plan, then work should be stopped whilst the plan is updated, and everyone involved is made aware of the changes. Short notice, short duration and the unlikeliness of a rescue being required are not acceptable reasons for not having an effective rescue plan in place.

R3. Site Details	
Address	
Site specific requirements *(e.g. 4-wheel drive vehicle, site security, site emergency contacts, key codes or access through locked gates/doors and the presence of restricted spaces)*	

R4. Designated Safe Zone

R5. Task Description *(brief description of operational work)*

R6. Access and Egress from Worksite *(requiring inclusion in the rescue plan)*

R7. Identification and Evaluation of Potential Rescue Causes	
Personnel	
Equipment	
Third Party	
Environment	

R8. Rescue Categorisation & Types *(tick as applicable)*							
Remote				Intervention			
R9. Hierarchy of Rescue Types *(tick as applicable)*							
Simple Remote SR-1		Simple Intervention SI-2		Complex Remote CR-3		Complex Intervention CIR-4	
R10. Rescue Procedure(s) *(step-by-step instructions/diagram)*							
Required Competency for Rescue	Level 1		Level 2		Level 3		
Rescue Team Size *(number)*							
R11. Roles and Responsibilities *(e.g. rescue team lead's, rescuer(s), equipment operator(s), sentry(s))*							

R12. Communication Roles and Types *(emergency communications)*	
Primary	
Secondary	
Tertiary	

R13. Designated Anchors

Rescue Equipment *(include specialist equipment such as breathing apparatus and passive equipment such as evacuation chairs and rescue stretchers)*	**Equipment**	**Specific Requirement**

R14. First Aid Provision

R15. Other Considerations

Rescue Team Acknowledgement of Rescue Plan			
Role	**Name** *(print)*	**Signature**	**Date** *(dd/mm/yyyy)*