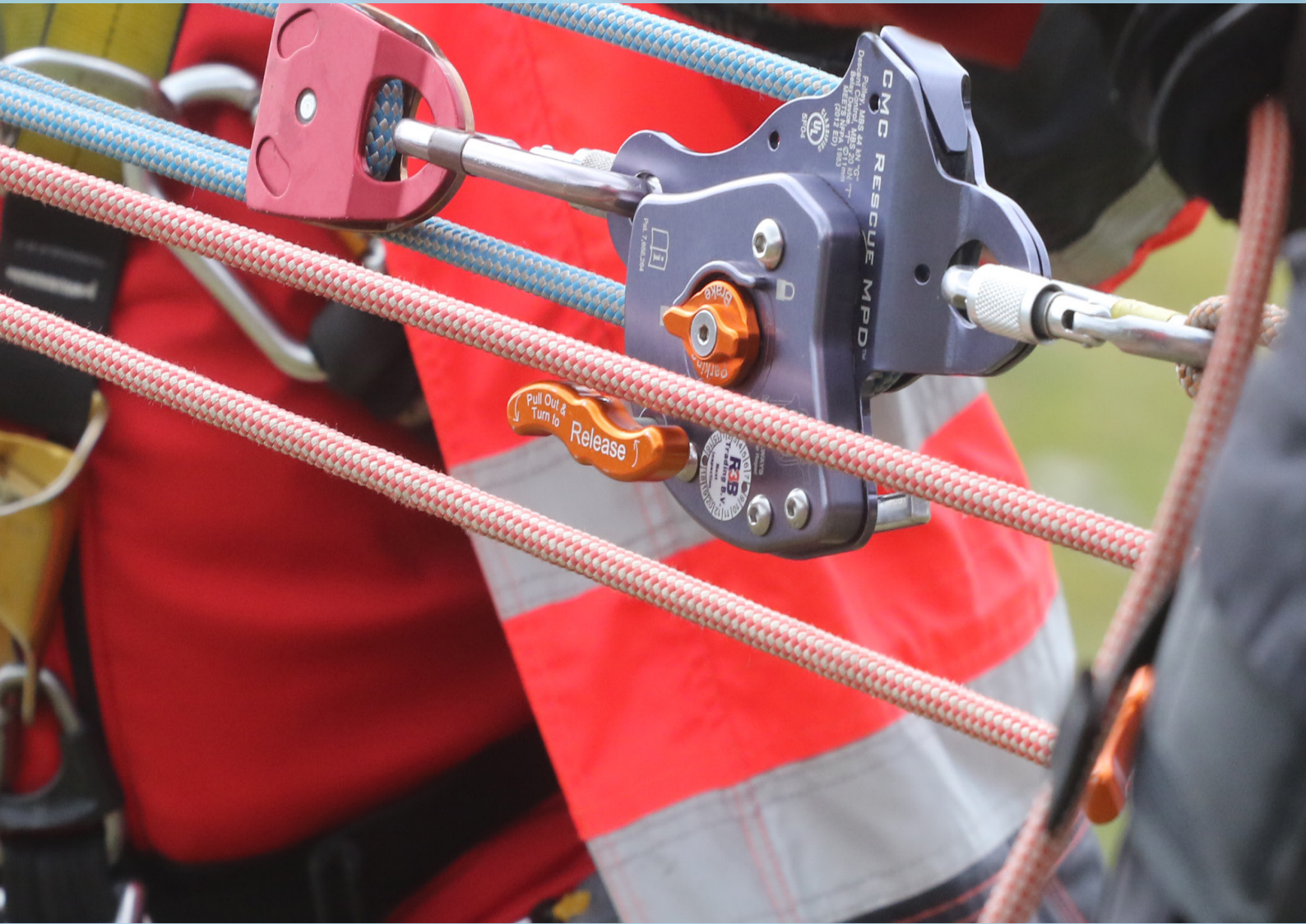




EMERGENCY RESPONDERS AND RESCUE TEAMS

About Rescue 3 Europe

Rescue 3 Europe develops state of the art technical rescue courses, providing internationally recognised accreditation for organisations and individuals operating in high risk environments.

As an international accrediting body, Rescue 3 provide up to date best practice guidance that is constantly evolving in line with new research and testing. All changes and developments of Rescue 3 courses go through a process of peer review and oversight by a steering committee made up of industry experts from all over the world.

Rescue 3 training providers deliver courses worldwide, in multiple disciplines, including: rope, water, boat, ice and confined space rescue. Our large suite of courses have been adopted by mountain rescue teams, wind turbine operators, fire and rescue services, ambulance teams, utilities providers, and military personnel.

Within each discipline, Rescue 3 accredited courses cover every level of operations, whether this is at an awareness level, avoiding risks and applying simple safe systems of work; or at more advanced levels where practitioners must acquire high levels of personal skills and understanding to access and navigate difficult environments.

For over four decades Rescue 3 has provided the standard for technical rescue training, offering guidance and support for maintaining best practice.





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EMERGENCY RESPONDERS AND RESCUE TEAMS COURSES

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Rope Rescue Operator (RRO)

Course overview and target audience

The Rope Rescue Operator course teaches the rope knowledge and skills required by personnel to operate safely and effectively as a member of a Rope Rescue Operator team. Rescuers will be taught a range of core rescue techniques to operate safely. Techniques covered on the course include safe working at height, work restraint, fall arrest, casualty care and packaging, team-based pick-offs, and team-based raising and lowering systems, amongst others.

More advanced rescues, complexities and variations, are covered on the Rope Rescue Technician (RRT) and Rope Rescue Specialist (RRS) courses.

Contact hours 30 hours (5 days)	Prerequisites None
Qualification valid for 3 years	Accredited by Rescue 3 Europe

Taught by

- Rope Rescue Operator Instructor (RROI)
- Rope Rescue Technician Instructor (RRTI)
- Rope Rescue Specialist Instructor (RRSI)

RRO

Assessment

The assessed elements of this course are:

- Foundation knowledge
- Personal ascending and descending
- Anchors and mechanical advantage
- Knots
- Use of rope control devices to lower, belay and capture progress



Rope Rescue Operator (RRO) skill sheet contents

RRO

Theory
1. Rescue 3 philosophy
2. Training standards and legislation
3. Medical considerations
4. Personal equipment
5. Technical and team equipment
6. Introduction to pre-plans
7. Risk assessments
8. Incident management and site control
9. Team roles
10. Considerations for night/poor visibility operations
11. Rope system design criteria
12. System safety checks
13. Loads and forces
14. Arrival on scene/incident size up
15. Command and control of a rescue system
Practical
16. Knots
17. Anchor systems
18. Rope protection
19. Work restraint
20. Fall arrest
21. Introduction to horizontal lifelines
22. Mechanical advantage
23. Casualty care and packaging
24. Personal ascending and descending
25. Climbing over a 90 degree edge in ascent and descent
26. Team-based pick-offs
27. Fixed high directionals
28. Team-based raising and lowering systems
29. Tagline offsets
30. Low and moderate angle stretcher transport

If used by agency
31. Climbing with lanyards (if used by agency)
32. Temporary artificial anchor points (if used by agency)
33. Connecting a casualty on a line using a telescopic pole (if used by agency)
34. Lifting and lowering a casualty using a pre-installed device (if used by agency)
35. Artificial frames - easel leg tripods (if used by agency)

'If used by agency' skills must be taught if a student's agency uses these skills operationally. Otherwise, they may be omitted by the training provider.



Rope Rescue Operator (RRO)

learning outcomes and key teaching points

	Skill sheet element		Learning outcome	Key teaching points
1	Rescue 3 philosophy	1.1	Recall the steps required in order to develop judgement	Training. Practice. Experience. Judgement.
		1.2	Explain the order of priorities when working at height	Self > team > victim
2	Training standards and legislation	2.1	Recognise the different training courses within the Rescue 3 scheme	Rope rescue courses. Confined space rescue courses. Water rescue courses. Boat rescue courses. Industry level courses.
		2.2	Recall the remit and role of an individual trained to this level	Rope Rescue Operator (RRO) remit and role. Member of a rescue team, undertaking rescues using the skills covered in the course.
		2.3	State how the Rescue 3 scheme fits within national and international standards and legislation	Rescue 3 scheme, NFPA, applicable local standards.
		2.4	State how the Rescue 3 scheme fits within agency policy and agency standard operating guidelines	Agency policy and agency standard operating guidelines.
		2.5	Recall applicable safe working at height legislation.	Multinational, national and/or local legislation.
3	Medical considerations	3.1	Identify signs/symptoms and treatment for common medical issues found in a vertical environment	Suspension-induced syncope, trauma.
		3.2	Identify individuals at risk for common medical issues found in a vertical environment, and control measures to minimise these	Casualty, rescuers, bystanders. Control measures: PPE, training, site zoning.

RRO



	Skill sheet element		Learning outcome	Key teaching points
4	Personal equipment	4.1	Identify personal protective equipment (PPE) for performing rescues at height, relative to the remit of someone trained to this level	Helmet, harness (work positioning, fall arrest), karabiners, descenders, fall arrest lanyards, footwear, rigging gloves etc.
		4.2	Have an awareness of applicable national and international standards for PPE	EN standards, applicable local standards
		4.3	Use appropriate PPE for performing rescues at height (relative to the remit of someone trained to this level), perform pre-use checks, donning and buddy checks	Pre-use checks vs. periodic examinations required by legislation. Checks: correct, compatible, condition, age, records and traceability, fastened, fit, anchors, clearance, size.
		4.4	Recall post-use care and inspection procedures for personal equipment	PPE inspection, storage and care.
5	Technical and team equipment	5.1	Identify technical and team equipment used for performing rescues at height, relative to the remit of someone trained to this level	Ropes, karabiners, pulleys, rope protection, rope grabs, descent control devices, stretchers, vacuum mattress, stretcher bridles, jiggers, rigging plates, webbing, slings, Prusiks, artificial frames etc.
		5.2	Have an awareness of applicable national and international standards for technical and team equipment	EN standards, applicable local standards.
		5.3	Recall post-use care and inspection procedures for technical and team equipment	Equipment inspection, storage and care.
		5.4	Recall methods of preventing dropped objects/ equipment.	Use of tool lanyards, catch netting etc.



	Skill sheet element		Learning outcome	Key teaching points
6	Introduction to pre-plans	6.1	Recall the four components of a generic pre-plan	Management, personnel, training, equipment.
		6.2	Identify sources of information useful for generic and task-/location-specific pre-planning	Weather forecasts, mapping, other relevant agencies, location of rescue and first aid equipment, history of location and type of incidents eg popular climbing/hiking areas, post-rescue documentation.
		6.3	Describe key information that should be included within a pre-plan	Site-specific risk assessment, general risk assessment, access or egress to site, topography, response plan.
7	Risk assessments	7.1	Identify the elements of an effective generic and site-specific risk assessment	Identify the hazards, decide who might be harmed and how, evaluate the risks and decide on precaution, record your findings and implement them, review your assessment and update if necessary.
		7.2	Identify the elements of an effective dynamic risk assessment	Real time process ensuring actual situational risks are identified, evaluated and managed that may not be covered by written risk assessment process. Constantly re-evaluated.
8	Incident management and site control	8.1	Based on hazard recognition, apply appropriate control measures to protect personnel and bystanders	Site zoning, exclusion zones and barriers.
		8.2	Install and mark site zones	Methods of marking site zones.
		8.3	Identify issues and hazards of bystanders in the exclusion zone	Crowd control, moral pressure, bystander safety.
9	Team roles	9.1	Identify team roles at a rescue site	Incident commander, team leader, safety officer, edge operator(s), attendant, operators of descent control devices, tailer(s), haul team members. Incident commander may double up as team leader and/or safety officer. Safety checks conducted by person who did not do initial rigging.



	Skill sheet element		Learning outcome	Key teaching points
10	Considerations for night/poor visibility operations	10.1	Identify hazards associated with night/poor visibility operations, and suitable control measures	Hazards: visibility and communication difficulties, affecting timescales, tracking of equipment and personnel. Control measures: Lighting, increased use of audible communication
		10.2	Identify types of lighting used within night operations	Snap lights, personal lights, scene lights, night vision goggles
		10.3	Recall how site control will differ based on time of day and available light	Equipment necessary, time of deployment, length of deployment and difficulty of task, lighting required, ability to transport extra equipment, hazards associated with deploying at height at night or in poor visibility
11	Rope system design criteria	11.1	Identify the key criteria for a rope rescue system	Redundancy. Critical point analysis. Hands-free test (aka whistle test). Safety factor.
12	System safety checks	12.1	Identify the components of a system safety check	Integrity of anchors - suitably strong and immovable. Independent and redundant anchors of 20+kN. Anchor leg angle - angles less than 90 degrees. Karabiners - locked. Loaded along major access. Loaded with gravity. Knots - appropriate, correctly tied and dressed. Devices - threaded correctly. Rope alignment - focal point and edge transition align. Safety checks conducted by person who did not do initial rigging.
		12.2	Perform a system safety check	Perform a safety check on a completed system and before use.



	Skill sheet element		Learning outcome	Key teaching points
13	Loads and forces	13.1	Differentiate between mass and force	Force = mass x acceleration.
		13.2	Identify SI base units and derived units used in rope rescue	Metre (length), second (time), kilogram (mass), Newton (force), metre per second per second (acceleration)
		13.3	Describe the differences between static and dynamic forces	Static = non-moving, eg being held in space. Dynamic = moving, eg an uncontrolled event.
		13.4	Recall the permissible maximum arrest force (MAF)	6kN (Europe) or 8kN (North America) for personal fall arrest. 15kN, for a rescue load as defined by BCCTR.
		13.5	Recall appropriate system safety factor determination methods	Use of force-limiting devices as a default. Recall 10:1 static system safety factor and its use.



	Skill sheet element		Learning outcome	Key teaching points
14	Arrival on scene/ incident size up	14.1	Recall the timeline of an incident	Arrival on scene. Incident size-up. Pre-rig briefing. Build phase. Safety checks. Operational phase. De-rig phase.
		14.2	Recall the actions upon arrival on scene	Stop. Check. Go.
		14.3	Recall the steps of incident size-up	Locate the casualty. Identify the edge transition. Identify focal point locations Identify anchors Is a change of direction needed? Is a high directional needed?
		14.4	Recall the components of a pre-rig briefing.	What we face What we are going to do Why we are going to do that Hazards Now talk to me. Anyone can call stop if they have safety concerns.
		14.5	Be aware of other briefing models that may be used at a rope rescue incident	Models such as: GSMEAC (Ground, Situation, Mission, Execution, Administration and Logistics, Command and control). IIMARCH (Information, Intent, Method, Administration, Risk assessment, Communications, and Humanitarian Issues) STAR (Site, Task, Actions, Rescue/emergency arrangements).
		14.6	Observe an on-site safety brief based on dynamic risk assessment	Safety brief highlights relevant hazards of a rescue site that will affect the rescue.



	Skill sheet element		Learning outcome	Key teaching points
15	Command and control of a rescue system	15.1	Recall communication options at a rope rescue site	Whistle signals. Radio communications. Hand signals. Pros and cons of above.
		15.2	Recall the stages of rigging a rescue site	Logistics area. Scene size-up. Set up a control zone demarcation line. Location of the casualty/equipment. Fall line. Proposed edge transition/ quality of edge transition. Rope alignment. Location of focal points. Suitable anchors. Communicating to the team. Rig the system. Fresh eyes safety check. Allocation of team roles for the operational phase.
		15.3	Recall the components of pre-operational team briefing	Big picture. Roll call. Edge transition brief. Dry run. Operate.
		15.4	Use a pre-determined set of commands that can be used during a typical rescue scenario	Use of agreed team commands such as quiet on the stance, red rope ready, blue rope ready, stop, down slow etc.
16	Knots	16.1	Identify, tie and check appropriate knots for performing rescues at height, relative to the remit of someone trained to this level.	Required knots: overhand knot, overhand on a bight, figure of eight, figure of eight on a bight, figure of eight follow through, alpine butterfly, clove hitch, barrel knot, longtail bowline (double or interlocking).. Additional optional knots that may be taught/used based on agency requirements: tape/water knot, Italian hitch, reef/square knot, Prusik knots.
		16.2	Recall factors affecting knot choice for performing rescues at height.	Ability to release under load. Ease of tying. Appropriate for task.



	Skill sheet element		Learning outcome	Key teaching points
17	Anchor systems	17.1	Identify rescue anchor considerations	Strength - can each focal point support 20+kN? Sharp edges - do textiles need protection from sharp edges? Contamination - are there chemicals on anchor points which can damage textiles, eg industrial settings? Focal point alignment - is it in line with direction of the intended load. Angles of anchor legs - less than 90 degrees. Even loading - do multi-point anchors distribute the load on each leg as evenly as possible? Independent - are the two anchor systems individually capable of supporting the entire rescue load if there is a catastrophic event in one side of the system?
		17.2	Recall the definitions of marginal, substantial and unquestionably sound anchors	Marginal: could not support a load of 20+kN on its own. Substantial: able to support of 20+kN on its own (such as one half of DCTTRS). Unquestionably sound: Able to support both halves of DCTTRS at the same time due to size and strength of the anchor.
		17.3	Identify anchor types	Natural anchors (trees, boulders), rock anchors (nuts/stoppers, cams), bolted anchors, ground anchors, industrial anchors (eg I-beams, eyelets, jamb beam anchors), vehicle anchors.



	Skill sheet element		Learning outcome	Key teaching points
	Anchor systems (continued)	17.4	Tie anchors suitable for RRO anchor systems	Eg wrap 3 pull 2, redundant wrap 2 pull 1, basket hitch, wrapped basket hitch, no knot, rethreaded figure of 8.
		17.5	Create substantial anchors for a DCTTRS system	Two separate substantial anchors (eg trees) able to support 20+kN each. Two independent focal points.
		17.6	Recall the definition of a contributory anchor system	A contributory anchor system comprises a number of multiple marginal anchors brought together to form a focal point of 20+kN
		17.7	Create contributory anchor systems for a DCTTRS system	2- and 3-point load-sharing anchors, able to support 20+kN each. Two independent focal points.
		17.8	Identify the benefits of cross-linked focal points	Improves safety of system by acting as a backup in the event of one of the anchors failing. If rescuer attached to one half of the system from being dragged over the edge. Prevents hardware being dragged over the edge and striking rescuer and casualty in the event of failure of one side of the system.
		17.9	Cross-link focal points	Use of sling to link two focal points of contributory anchor systems
18	Rope protection	18.1	Select, install and check appropriate rope protection	Emphasis on importance of rope protection. Comparison of protection offered by different types of rope protection. Considerations for protecting the rope over multiple edges. Considerations for protecting from hatches, eg hatches secured to prevent cutting ropes.
19	Work restraint	19.1	Identify when work restraint equipment is used, its merits and limitations	Prevents an operative from reaching a point where a fall from height could occur.
		19.2	Select, install and check appropriate work restraint equipment	Consider multiple edges. Anchor/ edge alignment. Suitability of anchor.



	Skill sheet element		Learning outcome	Key teaching points
20	Fall arrest	20.1	Identify when fall arrest equipment is used, its merits and limitations	Used where work restraint isn't appropriate (eg when climbing a structure) and where there is potential for a fall.
		20.2	Use a fall arrest device as a backup system when ascending/descending ropes	Fall arrest must be connected to sternal or dorsal harness attachment point (commonly sternal). Use of energy absorbers to limit MAF to <6kN (Europe) or <8kN (North America).
21	Introduction to horizontal lifelines	21.1	Identify where horizontal lifelines can be used	Providing safety for rescuers accessing a rescue site.
		21.2	Identify key considerations for horizontal lifelines	Equipment used for lifeline and attachment to lifeline. Initial set-up - self-belay or belay? Anchor points. Sag and clearance. Tension/MA? Capacity between anchors.
		21.3	Recall appropriate venues for a horizontal lifeline for a Rope Rescue Operator	RRO - easy/simple terrain, and easy placement of anchors, to allow a rescuer to safely access a rescue site, eg along a horizontal walkway or ledge. Good line of sight if using a belayer.
		21.4	Rig and use a horizontal lifeline relative to the remit of a Rope Rescue Operator	Rig and use following the key considerations above.



	Skill sheet element		Learning outcome	Key teaching points
22	Mechanical advantage	22.1	Identify the need for mechanical advantage systems within rope rescue.	Raising operations.
		22.2	Identify the hazards and control measures associated with mechanical advantage systems	Line and equipment failure considerations
		22.3	Identify the different categories of mechanical advantage systems	Simple, compound and complex. Internal and external.
		22.4	Build and check a variety of mechanical advantage systems	1:1 change of direction, 3:1 simple internal, 5:1 simple internal, 9:1 compound internal. Use of pre-rigged MA systems and jiggers.
		22.5	Recall the difference between ideal, theoretical and actual mechanical advantage	Ideal - calculated without consideration of practical real-world losses. (Eg 3:1) Theoretical - takes into account theoretical frictional loss, eg pulleys are typically 90-95% efficient. (Eg 2.85:1) Actual - real world calculations, affected by heat, slippage and rope stretch. Calculated with load cells.
		22.6	Calculate the ideal mechanical advantage of a system	T-method
23	Casualty care and packaging	23.1	Recall appropriate casualty care and packaging for a horizontal raise/lower	Level of packaging determined by casualty medical needs (injuries), duration of time in stretcher/litter, and environmental factors. Considerations for backup attachment point to casualty's harness. Other considerations: vacuum mattress, casualty bag, head guard (or helmet and eye protection if not available), medical gases.
		23.2	Pack a casualty for horizontal raise and lower	Use of appropriate packaging and securing for casualty in a horizontal plane.



	Skill sheet element		Learning outcome	Key teaching points
24	Personal ascending and descending	24.1	Identify hazards and control measures associated with ascending and descending	Redundancy, rope failure on edges, pre-rigging for rescue, physical effort involved.
		24.2	Demonstrate personal ascending using two rope (main and safety) system	Eg, With auto-locking descender, handled ascender and auto-locking backup device. With chest ascender, handled ascender, and auto-locking backup device. Hand ascender must be connected with harness lanyard when using chest ascender. Use of external belay to replace auto-locking backup device.
		24.3	Demonstrate personal descending using two rope (main and safety) system	With auto-locking descender, and auto-locking backup device. Use of external belay to replace auto-locking backup device.
		24.4	Convert from descent to ascent, and vice versa, whilst in suspension.	As an individual. Maintaining two points of contact throughout, on a two rope system with appropriate backup.
25	Climbing over a 90 degree edge in ascent and descent	25.1	Identify when a 90 degree edge would be encountered, its hazards and control measures	Tops of buildings, structures. Sharp edge - rope protection.
		25.2	Climb over a 90 degree edge	Perform a 90 degree edge transition as an individual in ascent and descent. Use of hand ascender and foot loop for assistance. Use of additional attachment points when passing edge on ascent using chest and hand ascenders.



	Skill sheet element		Learning outcome	Key teaching points
26	Team-based pick-off	26.1	Recall when a team-based pick-off would be performed	Team-based pick-offs are used to swiftly access and retrieve a casualty who doesn't require a stretcher, and whose injuries don't prevent them from wearing a harness - either their own harness, or a rescue harness (eg triangle harness). Considerations for rope stretch in the event of a long lower, eg if unweighting ropes.
		26.2	Participate in a team-based pick-off	Variations - suspended and non-suspended casualties. Suspended: Team raise of suspended casualty off their system. Rescuer raise of suspended casualty off their system using jigger. Non-suspended: Team-based lower.
27	Fixed high directionals	27.1	Identify when fixed high directionals would be used	Abrupt edge transitions, especially with stretchers. Reduces manual handling hazards, eases transition of stretcher, reduces fall factor.
		27.2	Create a fixed high directional	Eg two wrap 3 pull 2s on a tree, or redundant wrap 2 pull 1. Natural features, such as trees, should be loaded to maximise the compressive forces on the trunk, eg anchors on trunk or branches close to trunk, not on branches away from the trunk. Structural vertical and horizontal I-beams in an industrial setting are generally suitable as high directional anchor points.



	Skill sheet element		Learning outcome	Key teaching points
28	Team-based raising and lowering systems	28.1	Identify the advantages of a dual capability two tensioned rope system (DCTTRS) over designated main, designated belay (DMDB).	Greater resilience to sharp edges and rock fall. Reduced stopping distance and impact force on the surviving rope and system should there be a failure of one rope. Easier knot-passing capability. Requires less MA to be built on each rope as MA is distributed between each rope.
		28.2	Rig a dual capability two tensioned rope system (DCTTRS) with a high directional that can be used for raising and lowering	Dual capability two tensioned rope system (DCTTRS) utilising progress capture devices.
		28.3	Identify key considerations for incorporating a stretcher into a system	Rescuer and casualty attachment points. Stretcher (bridles) attachment options. Edge transition difficulties. Rope protection. Communication. Considerations for attaching to partner agency litters, animal rescue bags.
		28.4	Identify edge transitions taught at RRO and RRT	RRO: Fixed high directional, horizontal edge transition, with an attendant. RRO: Fixed high directional, horizontal edge transition, without an attendant (eg tagline offset). RRO, if used by agency: Artificial high directional, horizontal edge transition, with an attendant. RRT: Artificial high directional, horizontal edge transition, with an attendant. RRT: No high directional, vertical edge transition, with attendant off to the side at the point of transition. (Pike and pivot, also lower).



	Skill sheet element		Learning outcome	Key teaching points
	Team-based raising and lowering systems (continued)	28.5	Identify key considerations for edge transitions	Difficulty for attendant manoeuvring the stretcher. Potential edge failure. Rigging alignment errors. Lack of familiarity with location/lack of practice. Stumble/misfooting when transitioning over the edge. Edge loading of ropes. Misfeed on the rope control device.
		28.6	Perform a horizontal edge transition with the use of a fixed high directional	Fixed high directional, with an attendant and stretcher.
		28.7	Lower an attendant and stretcher using DCTTRS	As a team.
		28.8	Convert a lowering system to a raising system whilst loaded	Lock off system, create MA system, ready for raising.
		28.9	Recall HMA targets for raising a load (Haulers x Mechanical Advantage)	1 person load, HD: 10. 1 person load, no HD: 15-20. 2 person load, HD: 20. 2 person load, no HD: 30-40
		28.10	Select an appropriate number of haulers relative to the MA system used to meet the HMA target	HMA = haulers x mechanical advantage.
		28.11	Raise the rescue load using DCTTRS	As a team



	Skill sheet element		Learning outcome	Key teaching points
29	Tagline offsets	29.1	Identify offsets taught at RRO, RRT and RRS level	RRO: tagline RRT - guiding line, tracking line (vertical and moderate to steep ground), mirrored skateblock. RRS: Two rope offset, deflected offset.
		29.2	Identify general principles for offsets	Offsets are used to move a rescue package past an obstruction or outcrop, eg balcony or overhang. Type of terrain? Rescue team members available? What obstructions need to be cleared? Stretcher attendant needed? One or two person load? Where is the casualty being recovered to? How far does the package need to be pulled from the vertical to clear obstructions? Is extra redundancy required, eg additional taglines? The distance from the edge/wall should be kept to a minimum where possible, so that an unattended stretcher would only experience a small bump, or a stretcher attendant could manage the impact with their feet/legs.
		29.3	Identify merits and limitations of tagline offsets.	Simple and quick to set up. If two people are used, requires coordination for a smooth lower. If one person is used, can be heavy to manage and requires a bridle.
		29.4	Rig and operate a tagline offset.	As a team



	Skill sheet element		Learning outcome	Key teaching points
30	Low and moderate angle stretcher transport	30.1	Recall slope angle definitions	Low - 0-20 degrees. Moderate - 20-45 degrees. Steep - 45-70 degrees. High - 70-90 degrees.
		30.2	Recall number of attendants and ropes needed relative to slope angle	Low - 0-1 ropes, up to 6 attendants. Moderate - 1 or 2 ropes determined by terrain analysis, typically 3 attendants. Steep - 2 ropes, 2 attendants. High - 2 ropes, 1 attendant.
		30.3	Recall factors that affect peak force that can occur during an unplanned event during a slope rescue	Jolt factor, terrain analysis.
		30.4	Utilise techniques for transporting a stretcher over varied low and moderate terrain	Eg caterpillar, use of stretcher carry straps, talus belay, use of wheeled stretcher
		30.5	Perform a twin rope raise/lower on a moderate slope (if used by agency)	As a team.
31	Climbing with lanyards (if used by agency)	31.1	Identify when lanyards are used, their hazards and control measures (if used by agency)	When there's not a pre-installed fall arrest system. Anchor integrity, fall arrest distance, fall factor and secondary impacts and strikes, maximum arrest force. Control measures: correct use of PPE, awareness of hazards, minimising fall distance.
		31.2	Demonstrate climbing with a lanyard in ascent and descent (if used by agency)	Ascend and descend a suitable structure with lanyards, eg ladder.
		31.3	Identify when combined work positioning and fall arrest equipment is used, its merits and limitations (if used by agency)	Use of additional lanyard in conjunction with fall arrest lanyard, to create work positioning system. Work positioning utilised during resting on long ascent using fall arrest lanyards.
		31.4	Demonstrate resting during an ascent with a combined work positioning and fall arrest configuration (if used by agency)	Body weight supported until work positioning lanyard is in place in addition to fall arrest.



	Skill sheet element		Learning outcome	Key teaching points
32	Temporary artificial anchor points (if used by agency)	32.1	Identify, install and check temporary artificial anchor points (if used by agency)	Artificial door traverse anchors, artificial beam clamp anchors
33	Connecting a casualty on a line using a telescopic pole (if used by agency)	33.1	Identify when a casualty would be connected to a line using a telescopic pole, its merits and limitations (if used by agency)	Doesn't necessitate rescuer being in work positioning. Individual vs team-based rescues. Raising vs lowering.
		33.2	Connect a casualty to a line, using a telescopic pole (if used by agency)	Doesn't necessitate rescuer being in work positioning. Individual vs team-based rescues. Raising vs lowering.
34	Lifting and lowering a casualty using a pre-installed device (if used by agency)	34.1	Identify when a casualty would be lifted or lowered using a pre-installed device, its merits and limitations (if used by agency)	Regulations allow for use of single rope in an emergency. Considerations for addition of a safety rope backup based on hazard.
		34.2	Lift and lower a casualty using a pre-installed device (if used by agency)	Perform a casualty raise and lower using eg wheeled device or pre-rigged haul device.



	Skill sheet element		Learning outcome	Key teaching points
35	Artificial frames - easel leg tripods (if used by agency)	35.1	Recall the definitions of directional frames and anchor frames	Directional frame: the working lines connected to the load are anchored away from the frame. Typically used for 'over the edge' rope rescue situations. Anchor frame: Working lines connected to the load are anchored to the frame. Typically used when working within the footprint of the frame, eg hatch entries.
		35.2	Identify when easel leg tripod artificial high directional would be used, their merits and limitations (if used by agency)	Resultant forces on the artificial high directional (AHD). AHD as a critical point and consequences of failure. Reduces manual handling risks, eases transition of stretcher, reduces fall factor. Limitations: selection of appropriate high directional designed for use on an edge.
		35.3	Install and check an easel leg tripod artificial high directional(if used by agency)	Resultant force vector, consequences of failure. Considerations for running both ropes through the AHD. Hobbling requirements.
		35.4	Demonstrate an edge transition with the use of an easel leg tripod artificial high directional (if used by agency)	With a stretcher.





Rope Rescue Technician (RRT)

Course overview and target audience

The Rope Rescue Technician course builds upon the techniques taught at RRO, and enables Technicians to work in more complex environments, using more advanced rope rescue techniques. Techniques taught include the use of artificial frames, edge transitions, offsets and non-reeving highlines. This will give a Rope Rescue Technician a greater range of rescue solutions.

More advanced rescues, complexities and variations, are covered on the Rope Rescue Specialist (RRS) course.

Contact hours 30 hours (5 days)	Prerequisites Rope Rescue Operator (RRO)
Qualification valid for 3 years	Accredited by Rescue 3 Europe

Taught by

- Rope Rescue Technician Instructor (RRTI)
- Rope Rescue Specialist Instructor (RRSI)

Assessment

The assessed elements of this course are:

- Foundation knowledge
- Personal skills - Technician level
- Artificial frames - easel leg tripods
- Passing an obstruction whilst ascending/descending



Rope Rescue Technician (RRT) skill sheet contents

Theory	
1. Prerequisite knowledge from the RRO course	
Practical	
2. Prerequisite skills from the RRO course	
3. Anchor systems (Technician level)	
4. Mechanical advantage (Technician level)	
5. Passing obstructions whilst ascending/descending	
6. Narrow and wide rope transfers/changeovers	
7. Individual pickoff	
8. Artificial frames - easel leg tripods	
9. Casualty care and packaging for horizontal and vertical transport	
10. Horizontal edge transitions with an artificial high directional	
11. Vertical edge transitions without a high directional	
12. Switching stretcher orientation	
13. Tracking line offsets (and guiding line offsets)	
14. Skateblock offsets	
15. Passing knots through a system whilst raising and lowering	
16. Non-reeving highlines	



Rope Rescue Technician (RRT)

learning outcomes and key teaching points

	Skill sheet element		Learning outcome	Key teaching points
1	Prerequisite knowledge from the RRO course	1.1	Recall rope rescue knowledge, as covered on the Rescue 3 Rope Rescue Operator course.	The remit for RRT is a higher level of practical skills compared with RRO. RRTs will have a greater range of rescue solutions which can be utilised in rescue situations. The core principles of working at height apply in both RRO and RRT courses, including (but not limited to) appropriate use of work restraint, fall arrest, rope protection etc. Instructors may choose to reiterate some elements from the RRO course, based on time constraints and student needs.
2	Prerequisite skills from the RRO course	2.1	Demonstrate rope rescue skills, as covered on the Rescue 3 Rope Rescue Operator course.	The remit for RRT is a higher quality of practical skills compared with RRO. RRTs will have a greater range of rescue solutions which can be utilised in rescue situations. The core principles of working at height apply in both RRO and RRT courses, including (but not limited to) appropriate use of work restraint, fall arrest, rope protection etc. Instructors may choose to reiterate some elements from the RRO course, based on time constraints and student needs.

RRT



	Skill sheet element		Learning outcome	Key teaching points
3	Anchor systems (Technician level)	3.1	Recall anchor systems used at RRO level	Refer to RRO learning outcomes
		3.2	Recall the definition of a contributory anchor system	A contributory anchor system comprises a number of multiple marginal anchors brought together to form a focal point of 20+kN
		3.3	Identify factors that affect anchor leg stretch and loading of contributory anchor systems	Single vs. multi-strand. Distance of each leg between focal point and anchor. May be used to deliberately favour a stronger leg.
		3.4	Identify appropriate alignment of anchor legs to favour a stronger anchor in a contributory system	Anchor legs in line with a load can see a greater load than those that aren't in line.
		3.5	Create contributory anchor systems for a DCTTRS system, taking into account anchor leg stretch and loading	2- and 3-point load-sharing anchors, able to support 20+kN each, taking into account anchor leg stretch and loading. Two independent focal points.
		3.6	Identify the benefits of cross-linked focal points	Improves safety of system by acting as a backup in the event of one of the anchors failing. If rescuer attached to one half of the system from being dragged over the edge. Prevents hardware being dragged over the edge and striking rescuer and casualty in the event of failure of one side of the system.
		3.7	Cross-link focal points	Use of sling to link two focal points of contributory anchor systems



	Skill sheet element		Learning outcome	Key teaching points
	Anchor systems (Technician level) (continued)	3.8	Identify when back-tied anchors are used	To back up an anchor to better position the focal point. To reduce leverage if the front anchor placement is high on a tree.
		3.9	Back-tie an anchor	Build a back-tied anchor. Ensure anchors are in line or within a 30 degree cone. Use of a 3:1 MA system and interlocking slings at the front anchor.



	Skill sheet element		Learning outcome	Key teaching points
4	Mechanical advantage (Technician level)	4.1	Identify when internal and external MA systems are used	Internal systems are typically used for raising. They use the raising and lowering ropes to create the MA system. External systems generally use a separate rope that is piggybacked onto the original rope. They are usually used to tension another rope, though can be used to increase mechanical advantage on an existing system.
		4.2	Build a variety of mechanical advantage systems, both internal and external MA system	Internal and external, Eg simple 3:1, simple 5:1, compound 9:1.
		4.3	Identify when anchors are offset in MA systems	With compound systems, so that the whole system collapses at approximately the same speed, and therefore requires fewer resets. Angled offsets (bat-winging) can be used where there isn't enough room behind the initial anchor.
		4.4	Offset an MA system	Eg offset compound 9:1, either in straight line, or angled (bat-winging)
		4.5	Calculate the theoretical MA of an MA system.	Theoretical - takes frictional loss into consideration, as far as is possible. Using T-method and estimates for frictional loss (eg 90-95% for a pulley).



	Skill sheet element		Learning outcome	Key teaching points
	Mechanical advantage (Technician level) (continued)	4.6	Identify where pre-rigged MA (jigger systems) are used within rope rescue	Eg, adjustable system for stretcher attendant. As part of a stretcher bridle to allow stretcher orientation to be changed, eg pike and pivot.
		4.7	Use pre-rigged MA (jigger system)	Eg, adjustable system for stretcher attendant. As part of a stretcher bridle to allow stretcher orientation to be changed, eg pike and pivot.
5	Passing obstructions whilst ascending/descending	5.1	Identify obstructions that may need to be passed whilst ascending and descending, and the hazards and control measures associated with passing obstruction	Knots or re-belays. Hazards: dropping equipment, incorrect installation of devices, incorrect sequence of bypassing. Control measures: training, practice, use of lanyards with equipment
		5.2	Pass a variety of obstructions whilst ascending/descending	Knots or re-belays.



	Skill sheet element		Learning outcome	Key teaching points
6	Narrow and wide rope transfers/changeovers	6.1	Identify hazards and control measures associated with performing narrow rope transfers/changeovers (where the second set of ropes are less than 1.5m away)	Hazards: incorrect installation of devices, incorrect sequence of transfer/changeover, dropping equipment. Control measures: training, practice, use of lanyards with equipment."
		6.2	Perform a rope transfer/changeover where the sets of ropes are less than 1.5m from each other	Rope transfer/changeover as an individual, where the sets of ropes are less than 1.5m from each other.
		6.3	Identify key considerations for wide rope transfers (where the second set of ropes are more than 1.5m away)	Use of 4 points of attachment to mitigate pendulum effect in the event of rope failure. Method to reach second set of ropes - typically knotting all 4 ropes at floor level. By alternating between a short ascent on the second set of ropes, and a short descent on the I'D on the first set of ropes, the operator can make horizontal progress. Once underneath the anchors of the second set of ropes (with no more potential to swing in the event of an equipment failure), the I'D and first backup device can be removed from the first set of ropes.
		6.4	Perform a wide rope transfer (where the second set of ropes are more than 1.5m away)	Transfer from one set of ropes to another, using appropriate equipment and technique, starting from descent mode.



	Skill sheet element		Learning outcome	Key teaching points
7	Individual pick-off	7.1	Identify when an individual pick-off would be performed, its merits and limitations	Absence of a rescue team. Task-loads the rescuer. Fast and light approach compared to full rescue team. Valuable exercise to undertake during training, even if not used operationally.
		7.2	Demonstrate an individual pick-off	Perform an individual pick-off of a suspended victim. Use of pre-rigged MA to create the raise. Considerations for length of rope in service (rope stretch), suitability of fall arrest backup device and lanyard. Extra friction needed in mechanical descent device due to two person load. Use of two points of attachment for casualty.



	Skill sheet element		Learning outcome	Key teaching points
8	Artificial frames - easel leg tripods	8.1	Recall the definitions of directional frames and anchor frames	Directional frame: the working lines connected to the load are anchored away from the frame. Typically used for 'over the edge' rope rescue situations. Anchor frame: Working lines connected to the load are anchored to the frame. Typically used when working within the footprint of the frame, eg hatch entries.
		8.2	Identify the resultant force for a directional frame	Generally, the resultant force is at the mid-point of the angle at the directional pulley between the section of rope connected to the load and the rope leading to the anchor.
		8.3	Identify the resultant force for an anchor frame	In the same direction as the rope between the load and the head of the frame.
		8.4	Recall the importance of keeping the resultant force within the footprint of a frame	To prevent toppling. (Managing resultants outside of the footprint is taught at RRS).
		8.5	Recall types of artificial frames used at RRT level	Easel-leg tripod. (Sideways A-frame, A-frames and gin poles are taught at RRS).



	Skill sheet element		Learning outcome	Key teaching points
	Artificial frames - easel leg tripods (continued)	8.6	Identify key principles for using artificial frames	Identify the mode of use. Directional frame or anchor frame? Identify edge transition, required position of the frame and rigging focal points, to ensure correct alignment and loading of the frame. Identify expected resultant force on the frame Assemble the frame away from the edge. Belay the frame and move it into position. Identify the tendency of movement of the frame (both head and feet), based on expected resultant, (applied) force, and foreseeable resultants. Hobble/secure feet to prevent them moving. Guy the head of the frame to prevent movement. Are additional guy lines needed for stability and/or redundancy? Test-load the frame before use with a live load.
		8.7	Erect an easel-leg tripod	Footprint. Resultant force vector, consequences of failure. Hobbled and secured feet. Considerations for different types of feet - spiked or flat.



	Skill sheet element		Learning outcome	Key teaching points
9	Casualty care and packaging for horizontal and vertical transport	9.1	Identify appropriate casualty care and packaging for a horizontal and vertical raise/lower	Level of packaging determined by casualty medical needs (injuries), duration of time in stretcher/litter, and environmental factors. Considerations for backup attachment point to casualty's harness. Tie-in options for casualty in a vertical orientation, eg full body harness with webbing to secure casualty to stretcher. Use of throne position and appropriate strapping. Other considerations: vacuum mattress, casualty bag, head guard (or helmet and eye protection if not available), foot loops, medical gases.
		9.2	Pack a casualty for horizontal and vertical raise and lower	Use of appropriate packaging and securing for casualty in both horizontal and vertical planes.



	Skill sheet element		Learning outcome	Key teaching points
10	Horizontal edge transitions with an artificial high directional	10.1	Identify edge transitions taught at RRO and RRT	RRO: Fixed high directional, horizontal edge transition, with an attendant. RRO: Fixed high directional, horizontal edge transition, without an attendant (eg tagline offset). RRO, if used by agency: Artificial high directional, horizontal edge transition, with an attendant. RRT: Artificial high directional, horizontal edge transition, with an attendant. RRT: No high directional, vertical edge transition, with attendant off to the side at the point of transition. (Pike and pivot, also lower).
		10.2	Perform a horizontal edge transition with the use of an artificial high directional	Easel leg tripod, with an attendant and stretcher.
11	Vertical edge transitions without a high directional	11.1	Perform a vertical edge transition (lower), without a high directional	Attendant can straddle stretcher during transition, or be off to the side on separate set of ropes for edge transition, and then transfer on to the stretcher ropes after the edge
		11.2	Perform a vertical edge transition (pike and pivot raise) without a high directional	Horizontal raise, transition to vertical for edge transition (pike and pivot).



	Skill sheet element		Learning outcome	Key teaching points
12	Switching stretcher orientation	12.1	Identify when an attendant would switch stretcher orientation from horizontal to vertical or vice versa	Eg pike and pivot during a raise. Complex terrain lower, eg gully.
		12.2	Switch stretcher orientation from horizontal to vertical (or vice versa)	As part of pike and pivot raise - vertical edge transition.
13	Tracking line offsets (and guiding line offsets)	13.1	Identify offsets taught at RRO, RRT and RRS level	RRO: tagline RRT - tracking line (vertical and moderate to steep ground), mirrored skateblock. The theory of guiding line offsets is taught at RRT, and may also be taught practically as part of the session on tracking line offsets. RRS: Two rope offset, deflected offset.



	Skill sheet element		Learning outcome	Key teaching points
	Tracking line offsets (and guiding line offsets) (continued)	13.2	Identify general principles for offsets	Offsets are used to move a rescue package past an obstruction or outcrop, eg balcony or overhang. Type of terrain? Rescue team members available? What obstructions need to be cleared? Stretcher attendant needed? One or two person load? Where is the casualty being recovered to? How far does the package need to be pulled from the vertical to clear obstructions? Is extra redundancy required, eg additional taglines? The distance from the edge/wall should be kept to a minimum where possible, so that an unattended stretcher would only experience a small bump, or a stretcher attendant could manage the impact with their feet/legs.
		13.3	Identify merits and limitations of guiding line offsets	Forces can be too great to manage for one person. Generally creates a smoother lower than a tagline offset.
		13.4	Identify merits and limitations of tracking line offsets	More equipment intensive. Mechanical advantage system at ground level makes it easier to manage loads and forces. Creates a smooth and easily adjustable descent.
		13.5	Rig and operate a tracking line offset.	Run a tracking line system as a team.



	Skill sheet element		Learning outcome	Key teaching points
14	Skateblock offsets	14.1	Identify merits and limitations of mirrored skateblock offsets	Mirrored skateblock offset: Useful for tower rescues where the base of the tower is wider than the top. Equipment intensive. Landing zone is easily judged (typically 1/3 to 1/2 the height of the tower). (Also refer to general principles, above).
		14.2	Rig and operate a mirrored skateblock offset	Run a mirrored skateblock offset as a team.
15	Passing knots through a system whilst raising and lowering	15.1	Identify when a knot would be passed through a system	Joining of two ropes. Isolating a damaged part of rope.
		15.2	Pass knots through system whilst raising and lowering	Pass a knot through a system, whilst raising and lowering. Maintain control and redundancy throughout the process.



	Skill sheet element		Learning outcome	Key teaching points
16	Non-reeving highlines	16.1	Identify highlines taught at RRT and RRS level	RRT: non-reeving highline (aka dipping or drooping highline). RRS: reeving highline, with considerations for sloping highline.
		16.2	Identify when you would use different types of highlines	Terrain analysis dictating which highline to use. A non-reeving highline is used where topography allows - typically gorges and canyons without steep sides. It may also be used purely as a transport option from one side to another. A reeving highline may be used in a steep-sided canyon which requires a mid-point lower and raise. A sloping highline is where one side of a non-reeving or reeving highline is higher than the other, generally creating an angle of 45 degrees or more.
		16.3	Identify highline components	Control side, fixed side, messenger line, tracklines, force-limiting devices, load cells, taglines, reeve lines (reeving highline only), trackline carriage, rope grabs, festoons/hangers.



	Skill sheet element		Learning outcome	Key teaching points
	Non-reeving highlines (continued)	16.4	Identify highline rigging considerations	Calculating minimum number of tracklines ($T=DL/4Y$). Rescue 3 advocates two (or more). Tracklines independently rigged to help manage trackline elasticity and the amount of tension experienced by each rope. Use of force-limiting devices, eg Harken Clutch, Petzl Maestro, to allow excess tension to be reduced by slipping if the system is overloaded. Rig with de-rigging in mind, eg use of knots which are easily untied after loading, eg wrap 3 pull 2. Tracklines, taglines and reeve lines (reeving highlines only) should be independently anchored. Ensure rope alignment to facilitate smooth operation.



	Skill sheet element		Learning outcome	Key teaching points
	Non-reeving highlines (continued)	16.5	Identify appropriate tension for a highline	Only use as much tension as is required to clear the ground and obstacles. Working tension should generally not exceed 3kN in each trackline. Load cells can be incorporated into systems to give exact data for the loading of highlines. Force-limiting devices will help prevent over-tensioning. Pre-tensioning enables the system to be rigged and checked before final tensioning. This is 1 person pulling a 3:1 MA system, or 3 people hauling on a 1:1. If load cells aren't available, use the rule of 12 with 11mm rope (eg with a 3:1 MA system, a maximum of 4 rescuers could tension the line. $3 \times 4 = 12$). When tensioning ropes, pull steadily hand over hand (don't wrap the rope around the body). Don't give an extra 'heave' once maximum pulling ability is reached.



	Skill sheet element		Learning outcome	Key teaching points
	Non-reeving highlines (continued)	16.6	Identify appropriate connections for rescuer, casualty and stretcher in highlines	Rescuer: two points of attachment. Direct attachment to Kootenay carriage. Use of adjustable lanyards for positioning. Casualty (not in stretcher): harness, eg rescue harness or full body harness. Two points of attachment to casualty. Use of adjustable lanyards for positioning, oriented the other way to allow rescuer to more easily adjust the casualty's position. Stretcher: Use of rigging plate to attach stretcher bridles and rescuer and casualty attachment points.
		16.7	Identify the method for operating a non-reeving highline	Team members let out the tag line on the control side and take in on the fixed side. To lower a rescuer on a non-reeving highline, the tension is reduced on the taglines on both sides, and the tracklines on the control side. To raise, tension is increased on the tracklines and taglines.
		16.8	Rig and operate a non-reeving highline	Rig a non-reeving highline. Move a rescuer to a mid-point drop, lower to casualty, connect casualty, raise and recover rescuer and casualty to safety.



Rope Rescue Specialist (RRS)

Course overview and target audience

The Rope Rescue Specialist (RRS) course is for rope rescue team members who need advanced technical solutions for complex rope rescue environments. It builds upon the content of the Rope Rescue Operator and Rope Rescue Technician courses. Upon completing the course, Rope Rescue Specialists will be capable of using a range of advanced techniques, including advanced offsets, solving complex rescue scenarios, and rigging and operating reeving highlines, amongst others.

Contact hours 30 hours (5 days)	Prerequisites Rope Rescue Operator (RRO) and Rope Rescue Technician (RRT)
Qualification valid for 3 years	Accredited by Rescue 3 Europe

Taught by

- Rope Rescue Specialist Instructor (RRSI)

Assessment

The assessed elements of this course are:

- Foundation knowledge
- Personal skills - Specialist level
- Rigging a sideways A-frame, A-frame and/or monopod



Rope Rescue Specialist (RRS) skill sheet contents

RRS

Theory	
1. Prerequisite knowledge from the RRO and RRT courses	
Practical	
2. Prerequisite skills from the RRO and RRT courses	
3. Horizontal lifelines	
4. Low-stretch cord anchors	
5. Front-tensioned anchors	
6. Artificial frames - sideways A-frames	
7. Artificial frames - A-frames	
8. Artificial frames - gin poles	
9. Anchor frames for raising and lowering	
10. Two rope offset	
11. Deflected offset	
12. Multi-stage/multi-pitch lower and raise	
13. Reeving highline	
14. Night/poor visibility operations	
15. Solving complex rescue scenarios	
If used by agency	
16. Artificial anchors - rock anchors (nuts/stoppers and cams) (if used by agency)	
17. Industrial lead climbing (if used by agency)	
18. Horizontal aid climbing (if used by agency)	
19. Powered winches (if used by agency)	
20. Powered ascenders (if used by agency)	
21. Artificial anchors - jamb beam anchors (if used by agency)	
22. Artificial anchors - bolts (if used by agency)	

'If used by agency' skills must be taught if a student's agency uses these skills operationally. Otherwise, they may be omitted by the training provider.



Rope Rescue Specialist (RRS) learning outcomes and key teaching points

	Skill sheet element		Learning outcome	Key teaching points
1	Prerequisite knowledge from the RRO and RRT courses	1.1	Recall rope rescue knowledge, as covered on the Rescue 3 Rope Rescue Operator and Rope Rescue Technician courses.	The remit for RRS is rescuers utilising advanced technical solutions for complex rope rescue environments. The core principles of working at height apply in RRO, RRT and RRS courses, including (but not limited to) appropriate use of work restraint, fall arrest, rope protection etc. Instructors may choose to reiterate some elements from the RRO and RRT course, based on time constraints and student needs.

RRS



	Skill sheet element		Learning outcome	Key teaching points
2	Prerequisite skills from the RRO and RRT courses	2.1	Demonstrate rope rescue skills, as covered on the Rescue 3 Rope Rescue Operator and Rope Rescue Technician courses.	The remit for RRS is rescuers utilising advanced technical solutions for complex rope rescue environments. The core principles of working at height apply in RRO, RRT and RRS courses, including (but not limited to) appropriate use of work restraint, fall arrest, rope protection etc. Instructors may choose to reiterate some elements from the RRO and RRT course, based on time constraints and student needs.
3	Horizontal lifelines	3.1	Identify where horizontal lifelines can be used	Providing safety for rescuers accessing a rescue site.
		3.2	Identify key considerations for horizontal lifelines	Equipment used for lifeline and attachment to lifeline. Initial set-up - self-belay or belay? Anchor points. Sag and clearance. Tension/MA? Capacity between anchors.
		3.3	Recall appropriate venues for a horizontal lifeline for a Rope Rescue Specialist	RRS - more complex terrain, eg sloping, narrow ledges and changes of direction. More difficult and sparse anchor placement options.
		3.4	Rig and use a horizontal lifeline relative to the remit of a Rope Rescue Specialist	Rig and use following the key considerations above.



	Skill sheet element		Learning outcome	Key teaching points
4	Low-stretch cord anchors	4.1	Identify key considerations for low-stretch cord anchors	Low stretch, small diameter cord, which has a high strength relative to its diameter, can be used to tension each anchor leg independently. Generally, 8kN knotted strength per strand. Sufficient strands per leg - generally 3. Isolation loops between each anchor leg. Each anchor leg adjustable to tweak tension.
		4.2	Rig a low stretch cord anchor	Rig a low-stretch cord anchor.
5	Front tensioned anchors	5.1	Identify when front tensioned anchors are used	Long anchor legs and preventing associated stretch. Floating the focal point to make it easier to manage.
		5.2	Front tension an anchor	Build a front tensioned anchor.
6	Artificial frames - sideways A-frames	6.1	Recall configurations of artificial frame used at RRS level	Sideways A-frames, A-frames and gin poles
		6.2	Identify rigging considerations of a sideways A-frame	Can be placed closer to the edge than an A-frame. Requires side guys - locations are generally easier to find as they are on the top rather than over the edge. Appropriate placement and hobbling of feet, to prevent movement. Resultant force within the footprint. Guying needs to cope with the expected forces applied to the frame during normal use and other reasonably foreseeable forces.
		6.3	Rig and use a sideways A-frame as a high directional	As a team



	Skill sheet element		Learning outcome	Key teaching points
7	Artificial frames - A-frames	7.1	Identify correct rigging of an A-frame	Requires front and rear guys. It may be hard to find suitable anchors for the front guys on/over the edge. Appropriate placement and hobbling of feet, to prevent movement. Resultant force within the footprint. Considerations for movement as attendant goes over the edge. Guying needs to cope with the expected forces applied to the frame during normal use and other reasonably foreseeable forces.
		7.2	Rig and use an A-frame as a high directional	As a team
8	Artificial frames - gin poles	8.1	Identify correct rigging of a gin pole (monopod)	Requires multiple guys, ideally 4. It may be hard to find suitable anchors for the front guys on/over the edge. Appropriate placement of foot, to prevent movement. Resultant force as close to the footprint as possible. Guying needs to cope with the expected forces applied to the frame during normal use and other reasonably foreseeable forces.
		8.2	Rig and use a gin pole (monopod) as a high directional	Rigging a gin pole (monopod).



	Skill sheet element		Learning outcome	Key teaching points
9	Anchor frames for raising and lowering	9.1	Identify locations where anchor frames can be used for raising and lowering.	Over a hatch - resultant inside footprint. Over an edge - resultant outside of footprint. Requires guying.
		9.2	Identify key considerations when using an anchor frame for raising and lowering where the resultant is inside the footprint.	The resultant force applied to the anchor frame is in the same direction as the rope between the load and the head of the frame. Leg-mounted winch, mechanical or powered? Leg-mounted MA rope system?
		9.3	Identify key considerations when using an anchor frame for raising and lowering where the resultant is outside of the footprint.	If an anchor frame is used for an 'over the edge' operation, the resultant is outside of the footprint. Redundant guying (eg two or more rear guys under tension) will be needed to prevent a single point of failure of the anchor frame.
		9.4	Rig and use an anchor frame for an over the edge transition where the resultant is outside of the footprint	Appropriate guying for rigging an anchor frame for over the edge transition.
10	Two rope offset	10.1	Identify merits and limitations of two rope offsets	Used to transport rescuer and casualty from one side of gorge or building to another. Coordination between both stations essential, ensuring the trajectory of the rescue package stays close to edges and/or ground throughout the process, so as not to over-tension the system, creating a force multiplier.
		10.2	Rig and operate a two rope offset	As part of a team.



	Skill sheet element		Learning outcome	Key teaching points
11	Deflected offset	11.1	Identify merits and limitations of deflected offsets	Similar in principle to a tracking line offset, though tension managed from opposite top station with mechanical advantage system, rather than at ground level. Good communication essential.
		11.2	Rig and operate a deflected offset	As part of a team.
12	Multi-stage/multi-pitch lower and raise	12.1	Identify key considerations for multi-stage and multi-pitch lower and raises	Multi-stage: Eg industrial environment, off ladder, through hatch, out of building. Multi-pitch: Eg wilderness environment, multiple rope length lower, with intermediary stances. Sufficient and appropriate anchors at each stance - natural or artificial. Space for personnel and casualty to perform changeover (ledge or hanging stance?) Separate ropes for second lower/raise leaving first set of ropes in place? Or re-use existing ropes after making safe on the stance? Number of stages/pitches - 2 or more? Personnel needed for each stage of raise/lower? Last person down/up process? Eg abseil or personal ascent and equipment recovery?
		12.2	Rig and perform either a multi-stage or multi-pitch lower	Rig and perform, with at least two stages/pitches, following the key considerations above



	Skill sheet element		Learning outcome	Key teaching points
13	Reeving highline	13.1	Identify highlines taught at RRT and RRS level	RRT: non-reeving highline (aka dipping or drooping highline). RRS: reeving highline, with considerations for sloping highline.
		13.2	Identify when you would use different types of highlines	Terrain analysis dictating which highline to use. A non-reeving highline is used where topography allows - typically gorges and canyons without steep sides. It may also be used purely as a transport option from one side to another. A reeving highline may be used in a steep-sided canyon which requires a mid-point lower and raise. A sloping highline is where one side of a non-reeving or reeving highline is higher than the other, generally creating an angle of 45 degrees or more.
		13.3	Identify highline components	Control side, fixed side, messenger line, tracklines, force-limiting devices, load cells, taglines, reeve lines, trackline carriage, rope grabs, festoons/hangers.



	Skill sheet element		Learning outcome	Key teaching points
	Reeving highline (continued)	13.4	Identify highline rigging considerations	Calculating minimum number of tracklines ($T=DL/4Y$). Rescue 3 advocates two (or more). Tracklines independently rigged to help manage trackline elasticity and the amount of tension experienced by each rope. Use of force-limiting devices, eg Harken Clutch, Petzl Maestro, to allow excess tension to be reduced by slipping if the system is overloaded. Rig with de-rigging in mind, eg use of knots which are easily untied after loading, eg wrap 3 pull 2. Tracklines, taglines and reeve lines should be independently anchored. Ensure rope alignment to facilitate smooth operation.



	Skill sheet element		Learning outcome	Key teaching points
	Reeving highline (continued)	13.5	Identify appropriate tension for a highline	Only use as much tension as is required to clear the ground and obstacles. Working tension should generally not exceed 3kN in each trackline. Load cells can be incorporated into systems to give exact data for the loading of highlines. Force-limiting devices will help prevent over-tensioning. Pre-tensioning enables the system to be rigged and checked before final tensioning. This is 1 person pulling a 3:1 MA system, or 3 people hauling on a 1:1. If load cells aren't available, use the rule of 12 with 11mm rope (eg with a 3:1 MA system, a maximum of 4 rescuers could tension the line. $3 \times 4 = 12$). When tensioning ropes, pull steadily hand over hand (don't wrap the rope around the body). Don't give an extra 'heave' once maximum pulling ability is reached.



	Skill sheet element		Learning outcome	Key teaching points
	Reeving highline (continued)	13.6	Identify appropriate connections for rescuer, casualty and stretcher in highlines	Rescuer: two points of attachment. Direct attachment to Kootenay carriage. Use of adjustable lanyards for positioning. Casualty (not in stretcher): harness, eg rescue harness or full body harness. Two points of attachment to casualty. Use of adjustable lanyards for positioning, oriented the other way to allow rescuer to more easily adjust the casualty's position. Stretcher: Use of rigging plate to attach stretcher bridles and rescuer and casualty attachment points.
		13.7	Identify different reeving options, their merits and limitations	English reeve. Norwegian reeve. With an English reeve, movement in the x-axis and y-axis are independent of each other, and therefore the whole system is easier to manage than with a Norwegian reeve.
		13.8	Identify backup options for reeving highlines	Twin reeve lines Single reeve lines with 2 fall arrest devices as backup Single reeve line with independent backup



	Skill sheet element		Learning outcome	Key teaching points
	Reeving highline (continued)	13.9	Identify the method for operating a reeving highline	The taglines are used to position the rescuer above the victim in the x-axis. The reeve line(s) from the control side are paid out to lower the rescuer to the casualty. The MA systems on the reeve line(s) are then used to raise the rescuer and the casualty. The taglines are then used to recover both the rescuer and the casualty to safety (typically the control side).
		13.10	Identify additional rigging requirements for a sloping highline	With two taglines on the higher station, and with a single downhill tagline.
		13.11	Rig and operate a reeving highline	As a team
14	Night/poor visibility operations	14.1	Identify considerations for night/poor visibility operations	Need for increased control of rescue scene and operations. Clearly-defined briefing. Appropriate lighting for both personnel and scene. Lighting position - avoid dazzling rescuers. Mark equipment with reflective tape.
		14.2	Identify types of lighting used for night/poor visibility operations	Team, task, personal, equipment
		14.3	Perform a rope rescue scenario at night/in poor visibility	Use appropriate scenario, equipment and lighting to perform a night exercise.



	Skill sheet element		Learning outcome	Key teaching points
15	Solving complex rescue scenarios	15.1	Recall the importance of applying simple solutions where possible to rescue scenarios	Use of simple solutions where possible. The purpose of studying complex rescue scenarios is to enhance problem-solving abilities and consider extraordinary solutions for exceptional real world circumstances.
		15.2	Analyse, rig and undertake a complex rescue scenario	The instructor should apply constraints or additional factors that simulate real world complex rescue scenarios. Examples include, but are not limited to: complex terrain, limited space, unusual high directional configurations, access only from below/to the side, particular equipment available, or particular patient needs. The scenario and its solutions must adhere to the safety and operational principles of Rescue 3 rope courses.



	Skill sheet element		Learning outcome	Key teaching points
16	Artificial anchors - rock anchors (nuts/stoppers and cams) (if used by agency)	16.1	Recall appropriate use and placement of rock anchors (nuts/stopper and cams) to create an anchor (if used by agency)	Strength rating of different sizes? Placement - type of rock, good contact. Passive (nuts/stoppers) require a narrowing crack in the rock. Active (cams) can be used in cracks with parallel sides, or even flared cracks. May not perform well in icy cracks. May 'walk' in/out of crack if rope is moved a lot.
		16.2	Place a variety of rock anchors (nuts/stoppers and cams) to create a suitable anchor system (if used by agency)	Use of nuts, stoppers and cams to create a multi-point/contributory anchor system.



	Skill sheet element		Learning outcome	Key teaching points
17	Industrial lead climbing (if used by agency)	17.1	Identify key considerations for lead climbing in an industrial environment (if used by agency)	Use of equipment such as dynamic ropes, slings, karabiners and fixed anchors, eg bolts, beams, to ascend a structure as a lead climber. Use of belayer and appropriate belay device. Sufficient runners for length of ascent. Spacing should be more regular close to the ground, where rope stretch and proximity to the ground increases the likelihood of impact with the ground. Use of a variety of anchor points for runners, eg slings and karabiners, quickdraws on bolts. Lead climbing in a wilderness environment is complex and multi-faceted. It is not covered within the RRS course.
		17.2	Lead climb a suitable structure in an industrial environment (if used by agency)	Use of climber and belayer(s), to ascend a structure.



	Skill sheet element		Learning outcome	Key teaching points
18	Horizontal aid climbing (if used by agency)	18.1	Identify key considerations for horizontal aid climbing (if used by agency)	Use of equipment such as ropes, slings, fixed features eg bolts, footloops, beams, to move from one place to another. Two points of contact at all times, eg moving from two ropes, attach a sling to a beam, creating a third point of contact, before unclipping from second point of contact.
		18.2	Aid climb a suitable horizontal structure (if used by agency)	As an individual, maintaining two points of contact at all times. Move horizontally.
19	Powered winches (if used by agency)	19.1	Identify key considerations for powered winches	Mounting options - leg-mounted or floated? Behind or in place of haul system? Speed of ascent/ gearing of winch. Slip threshold of system. Edge attendant to have line of sight at all time, ensuring the load does not become hung up. Sufficient batteries to complete operation. Weight considerations for rescue team.
		19.2	Incorporate a winch into a rescue haul system	As a team. Positioning options.
20	Powered ascenders (if used by agency)	20.1	Identify key considerations for powered ascenders	Correct threading. Transport considerations. Use of remote control. Sufficient batteries. Use of backup system, eg ASAP. Benefit of multiple ascents and descents throughout a rescue.
		20.2	Use a powered ascender to ascend and descend a rope	As an individual.



	Skill sheet element		Learning outcome	Key teaching points
21	Artificial anchors - jamb beam anchors (if used by agency)	21.1	Recall appropriate use of jamb beam anchor (if used by agency)	Manufacturer's guidelines. Appropriate size for size of opening - window or door frame? Attachment points.
		21.2	Install a jamb beam anchor (if used by agency)	Use of jamb beam anchor, if used by agency.
22	Artificial anchors - bolts (if used by agency)	22.1	Recall appropriate use of bolts (if used by agency)	Bolt diameter. Bolt length. Drill depth. Distance from edge. Distance between bolts. Pull testing. Manufacturer's guidelines.
		22.2	Place bolts to create a suitable anchor system (if used by agency)	Drill and place suitable bolts for rescue loads



Rope Rescue Team Leader (RRTL)

Course overview and target audience

The Rope Rescue Team Leader course is for existing RRO, RRT or RRSs who will lead a team of that level at a rope rescue.

Contact hours 12 hours (2 days)	Prerequisites Rope Rescue Operator (RRO)
Qualification valid for 3 years	Accredited by Rescue 3 Europe

Taught by

- Rope Rescue Team Leader Instructor (RRTL I)

Assessment

The assessed elements of this course are:

- Foundation knowledge
- Perform a team briefing (pre-deployment, pre-rig or pre-operational briefing, or debriefing)
- Performing as a team leader during an incident



Rope Rescue Team Leader (RRTL) skill sheet contents

Theory	
1.	Prerequisite knowledge from the RRO, RRT and/or RRS courses
2.	Rope rescue legislation, documentation and guidance
3.	Rope rescue team typing
4.	Working with partner agencies
5.	Media considerations
6.	Pre-planning for incidents
7.	Risk assessments
8.	Arrival on scene/ incident size-up
9.	Team briefing and debriefing
10.	Post-incident procedures, paperwork and reporting
11.	Considerations for night/poor visibility operations
12.	Identifying confined spaces
13.	Team welfare considerations
14.	Command and control of a rescue system
Practical	
15.	Prerequisite skills from the RRO, RRT, and/or RRS courses
16.	Team-based rope rescue scenarios



Rope Rescue Team Leader (RRTL) learning outcomes and key teaching points

	Skill sheet element		Learning outcome	Key teaching points
1	Prerequisite knowledge from the RRO, RRT and/or RRS courses	1.1	Recall rope rescue knowledge, as covered on the Rescue 3 Rope Rescue Operator, Rope Rescue Technician and/or Rope Rescue Specialist courses.	The Rope Rescue Team Leader course is for existing RRO, RRT or RRSs who will lead a team of that level at a rope rescue. The core principles of working at height apply in RRO, RRT, RRS and RRTL courses, including (but not limited to) appropriate use of work restraint, fall arrest, rope protection etc.
2	Rope rescue legislation, documentation and guidance	2.1	Identify important components of local, regional and national rope rescue legislation, documentation and guidance.	Rescue team leaders attending rope rescue incidents should have an understanding of relevant local, regional and national legislation, documentation and guidance and how they affect their rescue team.
3	Rope rescue team typing	3.1	Recall the constituent components of rope rescue team types and their capability	RRO, RRT, RRS teams, remit and role. Team leaders should also have an understanding of team types used in their area/ country and their capability. Where do individual Rescue 3 training levels fit into the country or region's team-typing structure.

RRTL



	Skill sheet element		Learning outcome	Key teaching points
4	Working with partner agencies	4.1	Identify operational organisations likely to respond to rope rescue events	Team leaders should leave this session with a clear understanding of their country or region's incident management structure, and which organisations may be involved. Who has primacy in a rope rescue event? Who do I report to? Who reports to me? Recognition of capability, eg proof of training, ID cards. Joint training and MOUs with partner agencies.
		4.2	Identify the incident command system	Where, in the incident command system (ICS) would a team operate during a rope rescue incident? Who might you report to? What communication system may exist? What documentation would a Team Leader need to prepare and deliver?
5	Media considerations	5.1	Describe considerations for media management, relative to the remit of someone trained as a Rope Rescue Team Leader	RRTL remit and role. Referring media requests to Rope Rescue Incident Manager and/or media team. Considerations for public/media impression of actions. Briefing team members about media engagement. Contact details for official media liaison. Pre-planned statements. Use of language appropriate for incident and to prevent undue alarm or speculation.



	Skill sheet element		Learning outcome	Key teaching points
6	Pre-planning for incidents	6.1	Recall who has responsibility for developing pre-plans	Training manager? Team leader? Whole team? Team leader awareness of existing pre-plans, or direct involvement in developing pre-plans?
		6.2	List the four components of a generic pre-plan	Management, personnel, training, equipment
		6.3	Identify sources of information useful for generic and task-/ location-specific pre-planning	Weather forecasts, mapping, location of rescue and first aid equipment. Location and type of historical incidents in your area.
		6.4	Describe key information that should be included within a pre-plan	Site-specific risk assessment, general risk assessment, access and egress to site, topography, response plan
		6.5	Identify what a team leader should consider prior to an incident	Appropriate personal and team equipment for the rescue team and members. Team training (general and at accident hotspots). Pre-deployment paperwork and record keeping.
7	Risk assessments	7.1	Recall the elements of an effective generic and site-specific risk assessment	Identify the hazards, decide who might be harmed and how, evaluate the risks and decide on precaution, record your findings and implement them, review your assessment and update if necessary
		7.2	Recall the elements of an effective dynamic risk assessment	Real time process ensuring actual situational risks are identified, evaluated and managed that may not be covered by written risk assessment process
		7.3	Perform a dynamic risk assessment of a rope rescue scenario	Real time process ensuring actual situational risks are identified, evaluated and managed that may not be covered by written risk assessment process



	Skill sheet element		Learning outcome	Key teaching points
8	Arrival on scene/ incident size-up	8.1	Recall the timeline of an incident	Arrival on scene. Incident size-up. Pre-rig briefing. Build phase. Safety checks. Operational phase. De-rig phase.
		8.2	Recall the actions upon arrival on scene	Stop. Check. Go.
		8.3	Recall the steps of incident size-up	Locate the casualty. Identify the edge transition. Identify focal point locations. Identify anchors. Is a change of direction needed? Is a high directional needed?
		8.4	Be aware of other briefing models that may be used at a rope rescue incident	Models such as: GSMEAC (Ground, Situation, Mission, Execution, Administration and Logistics, Command and control). IIMARCH (Information, Intent, Method, Administration, Risk assessment, Communications, and Humanitarian Issues) STAR (Site, Task, Actions, Rescue/emergency arrangements). M/ETHANE (My call sign/major incident declared, Exact location, Type of incident, Hazards present and potential, Access and egress, Number and severity of casualties, Emergency services).



	Skill sheet element		Learning outcome	Key teaching points
9	Team briefing and de-briefing	9.1	Receive and record a briefing from an incident commander or relevant body	Accuracy of briefing, relevant information, location of deployment, relevant mapping, local knowledge
		9.2	Perform a pre-deployment briefing to a rope rescue team	Accurate brief, clear goals, and boundaries. Location. Equipment needed. Personnel available.
		9.3	Perform a pre-rig briefing of a rescue incident	What we face. What we are going to do. Why we are going to do that. Hazards. Now talk to me. Anyone can call stop if they have safety concerns.
		9.4	Perform a pre-operation briefing of the chosen rope rescue technique to be performed	Big picture. Roll call. Edge transition brief. Dry run. Operate.
		9.5	Debrief the incident	Team debriefing. Incident commander debrief
10	Post-incident procedures, paperwork and reporting	10.1	Recall what documentation and procedures needs to be completed by team leaders and team members post-incident	Handover of responsibility, search areas and times where appropriate, medical considerations and accident reporting, chain of command and reporting procedure, closing down of an incident
11	Considerations for night/poor visibility operations	11.1	Identify hazards associated with night/poor visibility operations, and suitable control measures	Hazards: visibility and communication difficulties, affecting timescales, tracking of equipment and personnel. Control measures: Lighting, increased use of audible communication
		11.2	Identify types of lighting used within night operations	Snap lights, personal lights, scene lights, night vision goggles
		11.3	Recall how briefing and site control will differ for a team leader based on time of day and available light	Equipment necessary, time of deployment, length of deployment and difficulty of task, lighting required, ability to transport extra equipment, hazards associated with deploying at height at night or in poor visibility



	Skill sheet element		Learning outcome	Key teaching points
12	Identifying confined spaces	12.1	Recall the definition of a confined space	Common characteristics of a confined space. Definitions such as UK confined space regulations definition, NFPA definition.
		12.2	Be aware of personal safety considerations when working near confined spaces at all times	Safe person concept. Do not enter confined spaces unless you have appropriate confined space training. Risks of confined space specific hazards, and other generic workplace hazards, eg slips, trips and falls. Electricity, other workers and machinery. Number of confined space fatalities who were would-be rescuers.
		12.3	Recall additional training required for entering and performing rescues in confined spaces	Rescue 3 confined space courses.
13	Team welfare considerations	13.1	Identify key welfare considerations for a rope rescue team	Appropriate PPE and equipment. Sufficient food and drink for extended rescue operations. Temporary shelters. Rotation of team members where necessary. Post-incident debriefing. Mental health considerations.



	Skill sheet element		Learning outcome	Key teaching points
14	Command and control of a rescue system	14.1	Recall the stages of rigging a rescue site	Logistics area. Scene size-up. Set up a control zone demarcation line. Location of the casualty/equipment. Fall line. Proposed edge transition/quality of edge transition. Rope alignment. Location of focal points. Suitable anchors. Communicating to the team. Rig the system. Fresh eyes safety check. Allocation of team roles for the operational phase.
		14.2	Use a pre-determined set of commands between team leader and rescue team, that can be used during a typical rescue scenario	Use of agreed team commands such as quiet on the stance, red rope ready, blue rope ready, stop, down slow etc.
		14.3	Identify the considerations for managing a crime scene or when performing a body recovery	Importance of not disturbing evidence, reporting to relevant authority, bystander control
15	Prerequisite skills from the RRO, RRT and/or RRS courses	15.1	Demonstrate rope rescue skills, as covered on the Rescue 3 Rope Rescue Operator, Rope Rescue Technician and/or Rope Rescue Supervisor courses.	The Rope Rescue Team Leader course is for existing RRO, RRT or RRSs who will lead a team of that level at a rope rescue. The core principles of working at height apply in RRO, RRT, RRS and RRTL courses, including (but not limited to) appropriate use of work restraint, fall arrest, rope protection etc.



	Skill sheet element		Learning outcome	Key teaching points
16	Team-based rope rescue scenarios	16.1	Perform multiple incident scenarios, taking the role of a team leader	This can be split into short scenarios (such as perform a pre-deployment briefing, perform a pre-rig briefing) and full incident scenarios from pre-deployment to post-briefing. Scenarios should be tailored to the level of training of the rescue team. The focus of scenarios is on the team leader's role within any given incident. All students should have the opportunity to perform as team leader. Time should be given at the end of each scenario for the instructor to debrief the designated team leader and other students on their performance.



Wind Turbine Access For Emergency Responders (WTAFER)

Course overview and target audience

The Wind Turbine Access for Emergency Responders (WTAFER) course is for members of the rescue services who may need to perform a rescue at a wind turbine. Wind turbines pose some special challenges: they are often in rural areas and/or are difficult to reach. Those working on wind turbines may be in potentially confined spaces, where a rescue is a challenging task for fire and rescue services and other emergency responders. Due to its international relationships, where instructors face these challenges from different perspectives (safe working, fire and rescue), Rescue 3 Europe has developed the Wind Turbine Access for Emergency Responders course to help organisations maintain high safety standards at all times. Rescue 3 Europe provides an agreed international certified training program to their training providers and instructors, to help them provide up to date information in this rapidly growing market of renewable energy.

Contact hours 12 hours (2 days)	Prerequisites Rope Rescue Operator (RRO), Rope Rescue Technician (RRT) or Rope Rescue Specialist (RRS) Minimum age: 18.
Qualification valid for 3 years	Accredited by Rescue 3 Europe

Taught by

- Wind Turbine Instructor (WTI)

Assessment

The assessed elements of this course are:

- Foundation knowledge



Wind Turbine Access For Emergency Responders (WTAFER) skill sheet contents

Theory
1. Rescue 3 philosophy
2. Training standards
3. Rescuer safety and survival
4. General hazards
5. Medical considerations
6. Dynamic risk assessment and incident size-up
7. Pre-planning
8. Communications
9. Types of wind turbine and operating principles
10. Lock-out, tag-out, try-out
Practical
11. Introduction to ropes and technical gear
12. Anchor systems
13. Placing rope protection
14. Administering treatment at height
15. Haul systems
16. Rescue of patient from tower/nacelle



Safe Working at Height for HART (SWAHHART)

Course overview and target audience

The SWAHHART course is designed for Hazardous Area Response Teams (HART) undertaking work at height. It meets the requirements of the UK's National Ambulance Resilience Unit (NARU) TIS NH 07: Safe Working at Height.

Contact hours 12 hours (2 days)	Prerequisites Minimum age: 18
Qualification valid for 3 years	Accredited by Rescue 3 Europe

Taught by

- Safe Working at Height for HART Instructor (SWAHHARTI)

Assessment

The assessed elements of this course are:

- Foundation knowledge
- Knots and anchors
- Climbing with lanyards
- Co-worker rescue with HART recovery pack



Safe Working at Height for HART (SWAHHART) skill sheet contents

Theory	
1. Rescue 3 philosophy	
2. Training standards	
3. Medical considerations	
4. Personal equipment	
5. Technical equipment	
6. Safe systems of work and pre-planning	
7. Risk assessments	
8. Incident size-up	
9. Incident management and site control	
10. Loads and forces	
11. Safety checks	
12. Communications	
13. Assessing partner agency rope systems	
Practical	
14. Knots	
15. Anchor systems	
16. Rope protection	
17. Work restraint	
18. Fall arrest	
19. Work positioning	
20. Connecting a casualty on a line using a telescopic pole	
21. Lifting and lowering a casualty using a pre-installed device	
22. Casualty care	
23. Climbing with lanyards	



Safe Working at Height for HART (SWAHHART) learning outcomes and key teaching points

	Skill sheet element		Learning outcome	Key teaching points
1	Rescue 3 philosophy	1.1	Recall the steps required in order to develop judgement	Training. Practice. Experience. Judgement
		1.2	Explain the order of priorities when working at height	Avoid working at height > Prevent falls > Minimise consequences of falls. Self > team > victim
2	Training standards	2.1	Recognise the different training courses within the Rescue 3 scheme	Rope rescue courses. Confined space rescue courses. Water rescue courses. Boat rescue courses. Industry level courses
		2.2	Recall the remit and role of an individual trained to this level	Safe Working at Height for HART (SWAHHART remit and role)
		2.3	State how the Rescue 3 scheme fits within UK work at height legislation	Rescue 3 scheme, Work at Height Regulations, NARU
		2.4	State how the Rescue 3 scheme fits within agency policy and agency standard operating guidelines	Agency policy and agency standard operating guidelines
3	Medical considerations	3.1	Identify signs/symptoms and treatment for common medical issues found in a vertical environment	Suspension-induced syncope, trauma
		3.2	Identify individuals at risk for common medical issues found in a vertical environment, and control measures to minimise these	Casualty, rescuers, bystanders. Control measures: PPE, training, site zoning



	Skill sheet element		Learning outcome	Key teaching points
4	Personal equipment	4.1	Identify personal protective equipment (PPE) for working at height	Anchor point, connection and harness. Types of connections including fall arrest kit, lanyard, fall arrest lanyard, lanyard for work positioning or restraint, fall arrest blocks, karabiners, maillons, hooks, rope, backup devices. Other equipment including helmet, tool lanyards, foot loops, rescue harness, gloves, eye protection, rope protection
		4.2	Recall national and international standards for PPE	EN standards, applicable local standards
		4.3	Select appropriate PPE for working at height, perform pre-use checks, donning and buddy checks	EN standards, PPE inspection, buddy checks
		4.4	Recall post-use care and inspection procedures for personal equipment	PPE inspection, storage and care
5	Technical equipment	5.1	Identify technical equipment used for working at height, including HART recovery pack	HART recovery pack contents, including reach pole, line, work positioning lanyard, rope protection, rope cutter, descender and rope grab, and pulley/block system
		5.2	Recall national and international standards for technical and team equipment	EN standards, applicable local standards
		5.3	Recall post-use care and inspection procedures for technical and team equipment	Equipment inspection, storage and care



	Skill sheet element		Learning outcome	Key teaching points
6	Safe systems of work and pre-planning	6.1	Recall the common components of a safe system of work	Hazard assessment, risk assessment, method statement, rescue plan, dynamic risk assessment, site briefing, review
		6.2	List the four components of a generic pre-plan	Management, personnel, training, equipment
		6.3	Identify sources of information useful for generic and task-/ location-specific pre-planning	Weather forecasts, mapping, other relevant agencies, location of rescue and first aid equipment, post-rescue documentation
		6.4	Describe key information that should be included within a pre-plan	Site-specific risk assessment, general risk assessment, access or egress to site, topography, response plan
7	Risk assessments	7.1	Identify the elements of an effective generic and site-specific risk assessment	Identify the hazards, decide who might be harmed and how, evaluate the risks and decide on precaution, record your findings and implement them, review your assessment and update if necessary
		7.2	Identify the elements of an effective dynamic risk assessment	Is written risk assessment relevant to conditions/ site/personnel? Weather considerations etc.
		7.3	Perform a dynamic risk assessment of a working area at height	Is written risk assessment relevant to conditions/ site/personnel? Weather considerations etc.
8	Incident size-up	8.1	Demonstrate use of size-up models	METHANE
		8.2	Explain the phases of a successful rescue	Locate. Access. Stabilise. Transport
		8.3	List rescue options	Use of HART recovery pack. Lowering vs raising
		8.4	Select an appropriate plan of action for a given incident	Dynamic risk assessment. Briefing models, eg STAR



	Skill sheet element		Learning outcome	Key teaching points
9	Incident management and site control	9.1	Based on hazard recognition, apply appropriate control measures to protect personnel and bystanders	Site zoning, chain of command, team roles
		9.2	Install and mark site zones	Methods of marking site zones
		9.3	Identify issues and hazards of bystanders in the exclusion zone	Crowd control, moral pressure, bystander safety
		9.4	Identify how and when to contact partner agencies in the event of an incident	Remit and training levels of HART and partner agencies
10	Loads and forces	10.1	Differentiate between mass and force	Force = mass x acceleration
		10.2	Identify SI base units and derived units used in rope rescue	Metre (length), second (time), kilogram (mass), Newton (force), metre per second per second (acceleration)
		10.3	Describe the differences between static and dynamic forces	Static = non-moving, eg being held in space. Dynamic = moving, eg an uncontrolled event
		10.4	Recall the maximum arrest force applicable by legislation	Eg 6kN within the European Union and 8kN within North America
11	Safety checks	11.1	Identify the components of a safety check	Correct equipment, compatible, condition, age, records and traceability, fastened correctly, PPE fit, anchors, ground clearance, site
		11.2	Perform a safety check	Correct equipment, compatible, condition, age, records and traceability, fastened correctly, PPE fit, anchors, ground clearance, site
12	Communications	12.1	Recall potential communication problems when working at height	Wind, distance, clothing
		12.2	Recall basic communication options when working at height, including being able to raise alarm in the event of an emergency	Whistle and air horns, radios, mobile phones



	Skill sheet element		Learning outcome	Key teaching points
13	Assessing partner agency rope systems	13.1	Identify when a HART operative would work at height in a partner agency's rope system	Multi-agency events. Rope systems requirements beyond HART remit
		13.2	Identify hazards and control measures when operating in a partner agency's rope system	Familiarity with equipment and devices. Underpinning knowledge of rope rescue systems
		13.3	Assess a variety of pre-rigged work at height systems	Comparison of safe and unsafe work at height systems, using eg photos, videos
14	Knots	14.1	Identify, tie and check appropriate knots for working at height	Overhand on a bight, figure of 8 on a bight, rethreaded figure of 8, BFK
		14.2	Recall factors affecting knot choice for working at height	Ability to release under load. Ease of tying. Appropriate for task. Ease of checking
15	Anchor systems	15.1	Identify use of anchor systems when working at height	Load sharing (compared to load distributing). Unquestionably sound anchors (aka bombproof). Strength requirements
		15.2	Select an appropriate single anchor point	Rated and tested or unquestionably sound anchor (aka bombproof anchor). Use of appropriate rope/webbing/strop and rope protection
		15.3	Select and create an appropriate 2-point load-sharing anchor	Internal angle, alignment
16	Rope protection	16.1	Select, install and check appropriate rope protection	Comparison of commercially-available products, and improvised products (eg canvas, fire hose etc.)
17	Work restraint	17.1	Identify when work restraint equipment is used, its merits and limitations	Prevents an operative from reaching an edge. Steep terrain work
		17.2	Select, install and check appropriate work restraint equipment	Consider multiple edges. Anchor/edge alignment. Suitability of anchor
		17.3	Select, install and check appropriate steep terrain work restraint equipment	Appropriateness of work restraint vs. work positioning equipment, due to nature of steep terrain



	Skill sheet element		Learning outcome	Key teaching points
18	Fall arrest	18.1	Identify when fall arrest equipment is used, its merits and limitations	Where work restraint isn't appropriate (eg when climbing a structure), and where there is likelihood of a fall
		18.2	Demonstrate use of a fall arrest system	Eg use of scaffold hooks with shock absorbing lanyard or self-retracting lifeline/fall arrest block. Maximum arrest force as defined in legislation
19	Work positioning	19.1	Identify when combined work positioning and fall arrest equipment is used, its merits and limitations	Work positioning utilised during resting on long ascent, or when required to work in suspension
		19.2	Demonstrate resting during an ascent with a combined work positioning and fall arrest configuration	Body weight supported until work positioning lanyard is in place in addition to fall arrest. Load is taken by work positioning configuration, not fall arrest
20	Connecting a casualty on a line using a telescopic pole	20.1	Identify when a casualty would be connected to a line using a telescopic pole, its merits and limitations	Doesn't necessitate rescuer being in work positioning. Individual vs team-based rescues. Raising vs lowering
		20.2	Connect a casualty to a line, using a telescopic pole	Doesn't necessitate rescuer being in work positioning. Individual vs team-based rescues. Raising vs lowering
21	Lifting and lowering a casualty using a pre-installed device	21.1	Identify when a casualty would be lifted or lowered using a pre-installed device, its merits and limitations	In an emergency, main line for single person load and safety line for rescue-sized load. Considerations for safety line based on hazard
		21.2	Lift a casualty using a pre-installed device	Perform a casualty raise
22	Casualty care	22.1	Identify personnel at risk to suspension-induced syncope, and control measures to minimise this	Casualties, workers. Pre-rigged systems allowing worker in suspension to be lowered to ground
		22.2	Demonstrate appropriate casualty care for suspected suspension-induced syncope	Rescue as soon as safely possible. Footloops for suspension relief. If unable to immediately release conscious casualty, raise legs. Standard first aid DR CABC protocols (danger, response, catastrophic haemorrhage, airway, breathing, circulation)



	Skill sheet element		Learning outcome	Key teaching points
23	Climbing with lanyards	23.1	Identify when lanyards are used, their hazards and control measures	When there's not a pre-installed fall arrest system. Anchor integrity, fall arrest distance, fall factor and secondary impacts and strikes, maximum arrest force (6kN). Control measures: correct use of PPE, awareness of hazards, minimising fall distance
		23.2	Demonstrate climbing with a lanyard in ascent and descent	Ascend and descend a suitable structure with lanyards, eg ladder





Safe Working at Height for Emergency Services (SWAHES)

Course overview and target audience

The Safe Working at Height for Emergency Services (SWAHES) course provides insight into the dangers that members of the emergency services face when working at height and the current legislation in this area.

During this course, students will learn how to properly use a variety of fall arrest resources, such as harnesses, lines, lanyards and fall arresters. The course covers, in detail, how these resources should be used in lifts, ladder trucks, and with a roof set, as used by fire services.

Contact hours 6 hours (1 days)	Prerequisites Minimum age: 18
Qualification valid for 3 years	Accredited by Rescue 3 Europe

Taught by

- Safe Working at Height Instructor (SWAHI)
- Co-Worker Rescue at Height Instructor (CWRHI)
- Rope Rescue Operator Instructor (RROI)
- Rope Rescue Technician Instructor (RRTI)
- Rope Rescue Specialist Instructor (RRSI)

Assessment

The assessed elements of this course are:

- Foundation knowledge
- Use of work restraint
- Anchors
- Emergency descending (if used by agency)



Safe Working at Height for Emergency Services (SWAHES) skill sheet contents

Theory	
1. Rescue 3 philosophy	
2. Training standards and legislation	
3. Medical considerations	
4. Personal equipment	
5. Safe systems of work	
6. Risk assessments	
7. Site control	
8. Loads and forces	
9. Safety checks	
10. Communications	
Practical	
11. Knots	
12. Anchor systems	
13. Rope protection	
14. Work restraint	
If used by agency	
15. Fall arrest (if used by agency)	
16. Work positioning (if used by agency)	
17. Emergency descending (if used by agency)	
18. Climbing with lanyards (if used by agency)	
19. Ladders (if used by agency)	
20. Improvised roof safety systems (if used by agency)	

'If used by agency' skills must be taught if a student's agency uses these skills operationally. Otherwise, they may be omitted by the training provider.



Safe Working at Height for Emergency Services (SWAHES) learning outcomes and key teaching points

	Skill sheet element		Learning outcome	Key teaching points
1	Rescue 3 philosophy	1.1	Recall the steps required in order to develop judgement	Training. Practice. Experience. Judgement
		1.2	Explain the order of priorities when working at height	Avoid working at height > Prevent falls > Minimise consequences of falls
2	Training standards and legislation	2.1	Recognise the different training courses within the Rescue 3 scheme	Rope rescue courses. Confined space rescue courses. Water rescue courses. Boat rescue courses. Industry level courses
		2.2	Recall the remit and role of an individual trained to this level	Safe Working at Height for Emergency Services (SWAHES) remit and role
		2.3	State how the Rescue 3 scheme fits within national and international standards	Rescue 3 scheme, NFPA, applicable local standards
		2.4	Recall applicable safe working at height legislation	Multinational, national and/or local legislation
3	Medical considerations	3.1	Identify signs/symptoms and treatment for common medical issues found in a vertical environment	Suspension-induced syncope, trauma
		3.2	Identify individuals at risk for common medical issues found in a vertical environment, and control measures to minimise these	Casualty, rescuers, bystanders. Control measures: PPE, training, site zoning



	Skill sheet element		Learning outcome	Key teaching points
4	Personal equipment	4.1	Identify personal protective equipment (PPE) for working at height	Anchor point, connection and harness. Types of connections including fall arrest kit, lanyard, fall arrest lanyard, lanyard for work positioning or restraint, fall arrest blocks, karabiners, maillons, hooks, rope, backup devices. Other equipment including helmet, tool lanyards, foot loops, rescue harness, gloves, eye protection, rope protection
		4.2	Recall national and international standards for PPE	EN standards, applicable local standards
		4.3	Select and demonstrate use of appropriate PPE for working at height, perform pre-use checks, donning and buddy checks	EN standards, PPE inspection, buddy checks
		4.4	Recall post-use care and inspection procedures for personal equipment	PPE inspection, storage and care
5	Safe systems of work	5.1	Recall the common components of a safe system of work	Hazard assessment, risk assessment, method statement, rescue plan, dynamic risk assessment, site briefing, review
6	Risk assessments	6.1	Identify the elements of an effective generic and site-specific risk assessment	Identify the hazards, decide who might be harmed and how, evaluate the risks and decide on precaution, record your findings and implement them, review your assessment and update if necessary
		6.2	Identify the elements of an effective dynamic risk assessment	Is written risk assessment relevant to conditions/site/personnel? Weather considerations etc
		6.3	Perform a dynamic risk assessment of a working area at height	Is written risk assessment relevant to conditions/site/personnel? Weather considerations etc



	Skill sheet element		Learning outcome	Key teaching points
7	Site control	7.1	Based on hazard recognition, apply appropriate control measures to protect personnel and bystanders	Site zoning, team roles
		7.2	Install and mark site zones	Methods of marking site zones
		7.3	Identify issues and hazards of bystanders in the exclusion zone	Crowd control, bystander safety
8	Loads and forces	8.1	Differentiate between mass and force	Force = mass x acceleration
		8.2	Identify SI base units and derived units used in rope rescue	Metre (length), second (time), kilogram (mass), Newton (force), metre per second per second (acceleration)
		8.3	Describe the differences between static and dynamic forces	Static = non-moving, eg being held in space. Dynamic = moving, eg an uncontrolled event
		8.4	Recall the maximum arrest force applicable by legislation	Eg 6kN within the European Union and 8kN within North America
9	Safety checks	9.1	Identify the components of a safety check	Correct equipment, compatible, condition, age, records and traceability, fastened correctly, PPE fit, anchors, ground clearance, site
		9.2	Perform a safety check	Correct equipment, compatible, condition, age, records and traceability, fastened correctly, PPE fit, anchors, ground clearance, site
10	Communications	10.1	Recall potential communication problems when working at height	Wind, distance, clothing
		10.2	Recall basic communication options when working at height, including being able to raise alarm in the event of an emergency	Whistle and air horns, radios, mobile phones
11	Knots	11.1	Identify, tie and check appropriate knots for working at height, or connect to pre-sewn terminations	Eg sewn termination, overhand on a bight, figure of 8 on a bight, rethreaded figure of 8, clove hitch
		11.2	Recall factors affecting knot choice for working at height	Ability to release under load. Ease of tying. Appropriate for task. Ease of checking



	Skill sheet element		Learning outcome	Key teaching points
12	Anchor systems	12.1	Identify use of anchor systems when working at height	Load sharing (compared to load distributing). Unquestionably sound anchors (aka bombproof). Strength requirements
		12.2	Select an appropriate single anchor point	Rated and tested or unquestionably sound anchor (aka bombproof anchor). Use of appropriate rope/webbing/strop and rope protection
		12.3	Select and create an appropriate 2-point load-sharing anchor	Internal angle, alignment
		12.4	Identify agency use or non-use of artificial anchor points (if used by agency)	Agency policy and standard operating guidelines
		12.5	Identify, install and check temporary artificial anchor points (if used by agency)	Artificial door traverse anchors, artificial beam clamp anchors
13	Rope protection	13.1	Select, install and check appropriate rope protection	Comparison of commercially-available products, and improvised products (eg canvas, fire hose etc). (Rope protection is sometimes known as edge protection).
14	Work restraint	14.1	Identify when work restraint equipment is used, its merits and limitations	Prevents an operative from reaching an edge
		14.2	Select, install and check appropriate work restraint equipment	Consider multiple edges. Anchor/edge alignment. Suitability of anchor
15	Fall arrest (if used by agency)	15.1	Identify when fall arrest equipment is used, its merits and limitations (if used by agency)	Where work restraint isn't appropriate (eg when climbing a structure), and where there is likelihood of a fall
		15.2	Demonstrate use of a fall arrest system (if used by agency)	Eg use of scaffold hooks with shock absorbing lanyard or self-retracting lifeline/fall arrest block. Maximum arrest force as defined in legislation



	Skill sheet element		Learning outcome	Key teaching points
16	Work positioning (if used by agency)	16.1	Identify when combined work positioning and fall arrest equipment is used, its merits and limitations (if used by agency)	Work positioning utilised during resting on long ascent, or when required to work in suspension
		16.2	Demonstrate resting during an ascent with a combined work positioning and fall arrest configuration (if used by agency)	Body weight supported until work positioning lanyard is in place in addition to fall arrest
17	Emergency descending (if used by agency)	17.1	Identify hazards and control measures associated with pre-installed escape devices (if used by agency)	Anchor, edges, rope tangles, integrity of automated system, landing area
		17.2	Perform an emergency descent using a pre-installed escape device, (if used by agency)	Follow instructions on pre-installed escape device
18	Climbing with lanyards (if used by agency)	18.1	Identify when lanyards are used, their hazards and control measures (if used by agency)	When there's not a pre-installed fall arrest system. Anchor integrity, fall arrest distance, fall factor and secondary impacts and strikes, maximum arrest force (6kN). Control measures: correct use of PPE, awareness of hazards, minimising fall distance
		18.2	Demonstrate climbing with a lanyard in ascent and descent (if used by agency)	Ascend and descend a suitable structure with lanyards, eg ladder



	Skill sheet element		Learning outcome	Key teaching points
19	Ladders (if used by agency)	19.1	Recall legislation applicable to use of ladders (if used by agency)	Applicable multinational, national and/or regional legislation
		19.2	Identify hazards and control measure of using ladders (if used by agency)	Falls, potentially without fall arrest. Short duration. Pre-use checks. Ladders should be inspected, tagged and traceable. Level and stable at base and top of ladder. Is ladder secured/anchored? Appropriate height for task. Only carrying light materials/ tools
		19.3	Demonstrate climbing a ladder (if used by agency)	Pre-use checks. Level and stable at base and top of ladder. Is ladder secured/ anchored? If co-worker footing ladder, stand on bottom rung with both feet. Ladder at 75 degree angle. Maintain 3 points of contact. Face ladder when ascending/descending. Don't work off top 3 rungs. Don't overreach
20	Improvised roof safety systems (if used by agency)	20.1	Identify the uses, components and requirements of improvised roof safety systems (if used by agency)	Anchors, suitability for intended use (fall arrest or work restraint), releasability, rope protection/use of non-textile sections
		20.2	Demonstrate (as part of a group) the rigging and use of an improvised roof safety system (if used by agency)	Rope tensioned across or over roof to provide intermediate anchor points for work restraint or fall arrest. Requirement for system to be releasable if used for fall arrest to allow for user to be lowered to the ground if needed following a fall. Areas of potential rope damage (roof ridge/edges) to be protected to prevent rope damage or rope isolated by non-textile section (eg steel strop) to prevent damage



Rope Over Water (ROW)

Course overview and target audience

The Rope Over Water (ROW) course is designed for rescuers who hold, at a minimum, Rescue 3 Swiftwater and Flood Rescue Technician (SRT) and Rope Rescue Operator (RRO) certifications. This course emphasises the unique challenges of conducting rescues that require both rope and water rescue skills, addressing the specific hazards that arise when integrating multiple rescue disciplines.

Contact hours 6 hours (1 day)	Prerequisites Rescue 3 Swiftwater and Flood Rescue Technician (SRT) and Rescue 3 Rope Rescue Operator (RRO) Minimum age: 18
Qualification valid for 3 years	Accredited by Rescue 3 Europe

Taught by

- Rope Over Water Instructor
This is an SRTI and RROI who has completed the ROW course.

Assessment

The assessed elements of this course are:

- Foundation knowledge
- Knots and anchor systems for combined water and rope operations
- Rope to water transitions



Rope Over Water (ROW) skill sheet contents

Theory	
Prerequisite knowledge from the SRT and RRO courses	
Rescue 3 philosophy	
Training standards	
Risk assessment for combined water and rope operations	
Incident management and site control for combined water and rope operations	
Considerations for night/poor visibility at combined water and rope operations	
Practical	
Prerequisite skills from the SRT and RRO courses	
Knots and anchor systems for combined water and rope operations	
Casualty care and packaging for combined water and rope operations	
Team-based raising and lowering systems for rope over water operations	
Fixed high directionals	
PPE considerations for combined water and rope operations	
Reverse reset	
Rope to water transitions	



Rope Over Water (ROW) learning outcomes and key teaching points

	Skill sheet element		Learning outcome	Key teaching points
1	Prerequisite knowledge from the SRT and RRO courses	1.1	Recall water rescue knowledge, as covered on the Rescue 3 Swiftwater and Flood Rescue Technician course.	The core principles of working in water apply in both SRT and ROW, including (but not limited to) appropriate use of PPE, site zoning, team roles, water rescue techniques etc. Instructors may choose to reiterate some elements from the SRT course, based on time constraints and student needs.
		1.2	Recall rope rescue knowledge, as covered on the Rescue 3 Rope Rescue Operator course.	The core principles of working at height apply in both RRO and ROW, including (but not limited to) appropriate use of work restraint, fall arrest, rope protection etc. Instructors may choose to reiterate some elements from the RRO course, based on time constraints and student needs.
2	Rescue 3 philosophy	2.1	Recall the steps in order to develop judgement.	Training. Practice. Experience. Judgement.
		2.2	Explain the order of priorities at a water rescue scene.	Self > team > victim.
3	Training standards	3.1	Recognise the different training courses within the Rescue 3 scheme.	Water rescue courses. Rope rescue courses. Boat rescue courses. Confined space rescue courses. Ice rescue courses.
		3.2	Recall the remit and role of an individual trained to ROW level	Rope Over Water (ROW) remit and role. Possess and apply a versatile range of rope and water rescue skills, enabling effective response in complex rescue situations that involve both rope and water environments.
		3.3	State how the Rescue 3 scheme fits within national and international standards.	Rescue 3 scheme, Defra, NFPA, applicable local standards.
		3.4	State how the Rescue 3 scheme fits within agency policy and agency standard operating guidelines.	Agency policy and agency standard operating guidelines.



	Skill sheet element		Learning outcome	Key teaching points
4	Risk assessment for combined water and rope operations	4.1	Identify the elements of an effective dynamic risk assessment.	Real time process ensuring actual situational risks are identified, evaluated and managed that may not be covered by written risk assessment process. Constantly re-evaluated
		4.2	Perform a dynamic risk assessment of a combined water and rope rescue site.	Real time process ensuring actual situational risks are identified, evaluated and managed that may not be covered by written risk assessment process. Constantly re-evaluated.
5	Incident management and site control for combined water and rope operations	5.1	Perform an on-site safety brief based on risk assessments.	Highlight relevant hazards that will affect the rescue.
		5.2	Select an appropriate plan of action for a given combined water and rope incident.	Decision-making models, such as 5+2 or TEMPOE.
		5.3	Apply different roles that may be allocated at a water & rope incident	Team leader, safety officer, edge operator(s), attendant/rescuer, rigger/operator(s), logistic. (Including upstream spotters and downstream backup), medic.
		5.4	Collate relevant information in order to deliver structured messages regarding an incident	Eg G-SMEAC, IIMARCH, STAR, REDO
		5.5	Apply a simple structure and centralised command, in order to brief and manage a team	Designating roles. Ensuring two-way communication
6	Considerations for night/ poor visibility at combined water and rope operations	6.1	Identify hazards associated with night/poor visibility operations, and suitable control measures	Hazards: visibility and communication difficulties, affecting timescales, tracking of equipment and personnel. Control measures: Lighting, increased use of audible communication
		6.2	Identify types of lighting used within night operations	Snap lights, personal lights, scene lights, night vision goggles
		6.3	Recall how site control will differ based on time of day and available light	Equipment necessary, time of deployment, length of deployment and difficulty of task, lighting required, ability to transport extra equipment, hazards associated with deploying at height at night or in poor visibility



	Skill sheet element		Learning outcome	Key teaching points
7	Prerequisite skills from the SRT and RRO courses	7.1	Demonstrate water rescue skills, as covered on the Rescue 3 Swiftwater and Flood Rescue Technician course.	The core principles of working in water apply in both SRT and ROW, including (but not limited to) appropriate use of PPE, site zoning, team roles, water rescue techniques etc. Instructors may choose to reiterate some elements from the SRT course, based on time constraints and student needs.
		7.2	Demonstrate rope rescue skills, as covered on the Rescue 3 Rope Rescue Operator course.	The core principles of working at height apply in both RRO and ROW, including (but not limited to) appropriate use of work restraint, fall arrest, rope protection etc. Instructors may choose to reiterate some elements from the RRO course, based on time constraints and student needs.
8	Knots and anchor systems for combined water and rope operations	8.1	Identify, tie and check appropriate knots for combined water and rope operations.	Italian hitch as part of a releasable rope over water system. Knots as required by SRT and RRO techniques.
		8.2	Select appropriate anchor points and/or systems for task.	Meet strength, alignment and redundancy requirements.
9	Casualty care and packaging for combined water and rope operations	9.1	Recall appropriate casualty care and packaging for a horizontal raise/lower in a combined water and rope operation	Level of packaging determined by casualty medical needs (injuries), duration of time in stretcher/litter, and environmental factors, including transition between water and rope environments. Considerations for backup attachment point to casualty's harness. Other considerations: vacuum mattress, casualty bag, head guard (or helmet and eye protection if not available), medical gases.
		9.2	Pack a casualty for a raise or lower in a combined water and rope operation	Use of appropriate packaging and securing for casualty.



	Skill sheet element		Learning outcome	Key teaching points
10	Team-based raising and lowering systems for rope over water operations	10.1	Rig a dual capability two tensioned rope system (DCTTRS) with a high directional that can be used for raising and lowering	Dual capability two tensioned rope system (DCTTRS) utilising progress capture devices.
		10.2	Identify key considerations for incorporating a stretcher into a system for rope over water operations	Rigging for two person load on raise. Rescuer and casualty attachment points. Stretcher (bridles) attachment options. Edge transition difficulties. Rope protection. Communication. Considerations for attaching to partner agency litters, animal rescue bags.
		10.3	Use a dual capability two tensioned rope system (DCTTRS) with a high directional for rope over water operations	Dual capability two tensioned rope system (DCTTRS) utilising progress capture devices.
11	Fixed high directionals	11.1	Identify when fixed high directionals would be used	Abrupt edge transitions, especially with stretchers. Reduces manual handling hazards, eases transition of stretcher, reduces fall factor. Fixed high directionals are generally preferable to artificial high directionals for rope over water configurations, due to possibility of the load moving with water flow when reaching water. Guying considerations if using AHD.
		11.2	Create a fixed high directional	Eg two wrap 3 pull 2s on a tree, or redundant wrap 2 pull 1. Natural features, such as trees, should be loaded to maximise the compressive forces on the trunk, eg anchors on trunk or branches close to trunk, not on branches away from the trunk. Structural vertical and horizontal I-beams in an industrial setting are generally suitable as high directional anchor points.



	Skill sheet element		Learning outcome	Key teaching points
12	PPE considerations for combined water and rope operations	12.1	Identify PPE for combined water and rope operations	Ensuring the safety of both rescuers and casualties requires that equipment is compatible with the specific rescue environments while maintaining personal protection. PPE must not interfere with the use of other essential safety gear; for example, a buoyancy aid should be able to fit comfortably over a harness. Helmets should be selected based on their ratings for the relevant environments and a thorough risk assessment that addresses the most significant hazards. Clean profile - avoiding non-releasable loops on harnesses that could cause entanglement. Full water PPE to be worn when suspended above the water, protects the rescuer in the event of accidental immersion. Compatibility of PFD with harness attachment points (sternal and waist). Choice of helmet (paddlesport vs mountaineering specification)
13	Reverse resets	13.1	Identify methods of lowering a rescuer and quickly converting to a raise	Eg lowering a rescuer on a raising system, by using reverse resets, which allows quick conversion to raise if necessary.
		13.2	Perform a conversion from lower to raise using reverse resets	Lower of rescuer on a raising system, using reverse reset, then converting to raise.

ROW



	Skill sheet element		Learning outcome	Key teaching points
14	Rope to water transitions	14.1	Identify appropriate releasable attachment method of rescuer to the rope system	Eg tied-off Italian hitch at waist. Karabiner at sternal attachment. Releasability of rope system, under control, into water (removal of backup connection from sternal point, and rigging of tied-off Italian hitch at waist attachment point).
		14.2	Identify the implications of coming off a rope system, into water	How fast is the water flow we are lowering into? Can we lower into an eddy or on to the bank? If rescuer is lowered into moving water and cannot release from the system, entrapment considerations. How movement of the rescuer in water can affect rope system, eg rope protection, high directional etc. Exit strategy, eg upstream, downstream, or raised on rope system. Downstream backup and containment if rescuer is swept away.
		14.3	Perform a rope to water transition	Landing site of rescuer considerations, eg eddy or bank, rather than fast moving water. Releasability of rope system. Considerations for two-person raise, eg attachment points. Exit strategy.





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