40995 Use industrial rope recovery and extrication techniques

Kaupae | Level	4
Whiwhinga | Credit	10
Whāinga | Purpose	This skill standard is for people working as part of an industry-based first response team. Learners will be able to plan, prepare, and carry out rope-based recovery and extrication in high-risk industrial environments, including heights, confined spaces, fixed and mobile plant, tunnel boring machines, shafts, and similar specialist contexts where there may be additional hazards such as gases, toxicity, or structural instability. This standard may be used in programmes leading to New Zealand Certificate in Emergency Response (Level 4).

Hua o te ako me Paearu aromatawai \| Learning outcomes and assessment criteria

Hua o te ako | Learning outcomes	**Paearu aromatawai |** Assessment criteria
1. Prepare and configure rope systems and safety equipment for industrial rope recovery and extrication.	a. Assess rope properties for recovery work, including safe working load (SWL), elasticity, and handling, and justify selections.
	b. Use appropriate knots for rope extraction.
	c. Select and use carabiners appropriate for load, shape, and orientation.
	d. Select and fit appropriate personal protective equipment (PPE) correctly.
	e. Select, inspect, fit, adjust, and buddy-check harnesses in line with manufacturer's instructions and site requirements.
	f. Identify and assess anchor points for strength, configuration, and rating.
	g. Rig slings safely, considering angles, basket, choke, temporary anchors, backups, and edge protection.
	h. Evaluate and use plant, structures, and temporary equipment as anchors as appropriate.

Hua o te ako | Learning outcomes	**Paearu aromatawai |** Assessment criteria
	i. Select and use redirection points to create a safe recovery pathway.
2. Carry out rope recovery and extrication operations using fall protection, haul systems and backup belay systems.	a. Develop and implement recovery and extrication plans for confined or complex spaces, plant, machinery, shafts, and specialist equipment.
	b. Select and use tethering systems for work positioning and safe movement.
	c. Assess and apply fall protection strategies for restraint, work positioning, and fall arrest.
	d. Apply specialist rope recovery extrication techniques to recover personnel.
	e. Operate proprietary progress capture systems and demonstrate use of simple, compound, and complex haul systems with correct setup, friction management, and edge protection.
	f. Design and implement appropriate backup and belay systems, including separate belay lines or twin haul systems as required.
3. Rig and deploy stretchers and attendant systems while managing high-risk environmental hazards.	a. Identify, assess, and manage additional environmental risks.
	b. Select and apply appropriate protection systems for falling object hazards and unstable surfaces.
	c. Deploy and rig stretchers and attendant systems.
	d. Connect an attendant to a stretcher or rigging plate using adjustable lanyards or independent movement systems.
4. Recommission equipment.	a. Clean and maintain equipment in line with manufacturers' instructions.
	b. Inspect and retire damaged or defective equipment where appropriate for replacement in accordance with organisational processes.
	c. Update bag tags or records to confirm equipment is fit and ready for deployment.

Pārongo aromatawai me te taumata paearu | Assessment information and grade criteria

Assessment specifications:

All work must comply with the Health and Safety at Work Act 2015 and associated regulations, relevant codes of practice, and Original Equipment Manufacturer (OEM) specifications.

Activities must stay within the following operational envelope:

- Loads under 250 kg for simple lifts; above 250 kg is a complex lift.
- Anchors must not exceed 12kN peak load.
- Lifts are limited to 35m unless additional shaft training is completed.
- No abseiling or self-ascending is included – team-based lowering and retrieval only.
- Backup and belay systems must be deployed wherever possible.

Assessments may be conducted under simulated conditions that reflect real work contexts and real-life constraints and environmental hazards.

Learners must demonstrate competence consistently to the required standard, which may include demonstrating performance across more than one situation or context.

Learners must demonstrate safe practices at all times, using approved equipment within its ratings.

Personnel should be aware of, and respect, any relevant cultural protocols, site-specific tikanga, or local iwi requirements that may apply to the site or the people involved in the incident.

Ngā momo whiwhinga | Grades available

Achieved

Ihirangi waitohu | Indicative content

Rope Rescue Equipment and Systems

- Types, characteristics, inspection, care, and limitations of:
  - Rescue ropes (static, low-stretch)
  - Knots: Figure-8 family, Italian hitch
  - Carabiners: types, ratings, safe orientation, locking, and within safe working load
  - Slings, webbing, edge protection devices
  - Tethering systems: ropes, knots, slings, rope grabs, adjustable lanyards, energy absorbers, and ascenders
  - Harnesses: selection, fitting, adjustment, and buddy-checking
  - Helmets and other PPE for high-angle and industrial contexts.

Risk Management and Site Safety

- Principles of hazard identification, assessment, and control measures.
- Site risk assessment for rope rescue/extrication scenarios.
- Safety factor calculations: anchor loads, angles, vector forces.
- Load and lift limits, simple vs complex lifts.
- Control measures for high-risk environments (gas, confined space, isolation, unstable structures).
- Emergency preparedness and situational awareness.

Anchor Systems and Rigging

- Types of anchor points: natural, structural, artificial.
- Assessing anchor strength, configuration, and safety.
- Rigging slings: angles, basket, choke, edge protection, backup anchors.
- Use of plant, machinery, scaffolding, and structures as anchors.
- Redirection points and how they affect loads and forces.

Personal Protection Systems and Fall Protection

- Helmets.
- Clothing.
- Footwear.
- Harnesses
- Application of work restraint, work positioning, and fall arrest systems.
- Tethering for climbing, lowering, work positioning, and confined access.
- Best practice for using adjustable lanyards, handled ascenders, rope grabs.
- Rescue scenarios requiring twin rope systems or independent backups.

Rope Recovery and Extrication Techniques

- Planning and executing recovery and extrication plans.
- Close and confined space extrication techniques.
- Use of progress capture devices and haul systems:
    - Simple, compound, complex hauling
    - Advantage systems, redirects, edge protection, friction management.
- Specialist techniques: aerial transfers, multi-stage extractions, leverage systems, redirects, and advantage systems.
- Use of proprietary equipment (e.g. Maestro systems).

Stretchers and Attendant Rigging

- Types of stretchers, evacuation triangles, and bridles.
- Rigging and deploying stretchers safely.
- Attendant connection methods: adjustable lanyards, rigging plates, separate belays.
- Control or tag lines for safe movement.

Backup and Belay Systems

- Designing and setting up appropriate backup or belay systems.
- Twin haul systems for redundancy.
- Monitoring and managing safety during lowering and recovery operations.

Environmental and Site Hazards

- High-risk environmental conditions: low visibility, gases, heat/cold, wet, isolation.
- Managing unstable structures or compromised equipment.
- Control measures: shoring, refuges, exclusion zones, safe work zones.

Recommissioning and Post-Operation Procedures

- Cleaning, drying, lubricating, and storing equipment.
- Inspection routines and identifying damage or wear.
- Retiring defective gear and updating equipment logs or bag tags.
- Reporting incidents and participating in operational debriefs.

Communication and Team Coordination

- Communication systems: radios and hand signals.
- Team roles and responsibilities during operations.
- Maintaining contact and situational awareness.

Cultural and Legal Context

- Understanding and applying relevant legislation and regulations:
  - HSWA 2015, supporting regulations, codes of practice, OEM specs.
- Awareness of site-specific tikanga, cultural protocols, and iwi engagement where applicable.

Rauemi | Resources

Legislation, regulations and/or industry standards

Primary Legislation

- Health and Safety at Work Act 2015 (HSWA) https://www.legislation.govt.nz/act/public/2015/0070/latest/DLM5976660.html.

Regulations

- Health and Safety at Work (Mining Operations and Quarrying Operations) Regulations 2016 https://www.legislation.govt.nz/regulation/public/2016/0017/latest/DLM6732829.html.
- Health and Safety at Work (General Risk and Workplace Management) Regulations 2016 https://www.legislation.govt.nz/regulation/public/2016/0013/latest/dlm6727530.html.
- Health and Safety at Work (Worker Engagement, Participation, and Representation) Regulations 2016 https://www.legislation.govt.nz/regulation/public/2016/0016/latest/dlm6314002.html.
- Building (Specified Systems, Change the Use, and Earthquake-prone Buildings) Regulations 2005 https://www.legislation.govt.nz/regulation/public/2005/0032/latest/DLM313966.html.

Codes of Practice and Guidelines

- Emergency Preparedness and Response Guidelines – WorkSafe NZ (2019).
- Emergency Preparedness in Mining and Tunnelling Operations – WorkSafe NZ (2016) https://www.worksafe.govt.nz/topic-and-industry/extractives/guidance-position-statements/emergency-preparedness-in-mining-and-tunnelling-acop/.
- Surface Mines Emergency Procedures Guide – Extractives Industry Advisory Group.
- NZ Mines Rescue Guidance (various internal documents and protocols).

Standards and Related References

- AS/NZS ISO 31000:2025 Risk Management – Principles and Guidelines.
- Original Equipment Manufacturer (OEM) specifications.

Medical and Casualty Transfer Guidance

- ACC and St John Trauma Protocols.
- NZQA First Aid Training Requirements.

Site-specific documents and plans

- Site Emergency Management Plans.
- Principal Hazard Management Plans (PHMPs).
- Principal Control Plans (PCPs).
- Standard Operating Procedures (SOPs).

Pārongo Whakaū Kounga | Quality assurance information

Ngā rōpū whakatau-paerewa | Standard Setting Body	Hanga-Aro-Rau Manufacturing, Engineering and Logistics Workforce Development Council
Whakaritenga Rārangi Paetae Aromatawai | DASS classification	Engineering and Technology > Extractive Industries Management > Extractive Industries Management
Ko te tohutoro ki ngā Whakaritenga i te Whakamanatanga me te Whakaōritenga | CMR	0014

Hātepe | Process	**Putanga** | Version	**Rā whakaputa** | Review Date	**Rā whakamutunga mō te aromatawai** | Last date for assessment
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Kōrero whakakapinga | Replacement information	N/A		
Rā arotake | Planned review date	31 December 2030		

Please contact Hanga-Aro-Rau Manufacturing, Engineering and Logistics Workforce Development Council at qualifications@hangaarorau.nz if you wish to suggest changes to the content of this skill standard.