

Confined Space Rescue

Tricks of the Trade

Welcome to the Confined Space “Tricks of the Trade” program at the PA Midstate Rescue Summit.

This program is designed to expose rescuers to **practical, field-tested techniques** that improve efficiency, adaptability, and problem-solving in confined space rescue environments.

Unlike highly controlled training environments, real-world confined space incidents often involve:

- Limited equipment
- Challenging access
- Time pressure
- Incomplete information

This session focuses on **decision-making and flexibility**, not just perfect setups.

Course Focus Areas

- Confined Space Pre-Planning
- Equipment Selection & Organization
- Tripod / High Directional Techniques
- Anchoring Challenges
- Patient Packaging Considerations
- Practical “Tricks” that improve efficiency

A **good plan now** is better than a perfect plan too late.

Resources Included

Equipment, Positions, SME, and Commands

Rescue Playbook

Student Workbooks: Detailed guides to accompany your learning experience.

CTR ROE: Detailed “Rules of Engagement” for rope and confined space rescue

CTR Tactical Worksheet: Structured tool used to plan, communicate, and execute rescue operations through defined roles, tasks, and playbook-driven decision-making.

QR Codes: Access our Confined Space Rescue Student Manuals and Rope Rescue Operations and Technician Student Manuals.

Photo and Video Gallery: Links to our SmugMug gallery for viewing shared class media and uploading your own photos and videos.

Contact Information: Stay connected with instructors through provided contact links.

Motivation and Credit

We extend our gratitude to Ronin Rescue, AERT, GiRo Rescue Systems, Highnovate, Rope Geeks, RopeLab, Sterling Rope, Petzl, SPRAT and ITRA for their influence on our training philosophy. Their commitment to developing both personal and technical skills in rescue operations has been instrumental in shaping this program.

Prepare to challenge yourself, collaborate with your peers, and expand your rescue capabilities. We look forward to a dynamic and transformative training experience with you.

If you have any questions or need further information, please don't hesitate to reach out. Let's get started!

Efficiency Mindset

Efficiency is not just speed—it is:

- Predictability
- Simplicity
- Repeatability
- Reduced cognitive load

Teams that perform well:

- Use **pre-thought-out systems**
- Understand **why systems work**
- Can adapt those systems rapidly

The Rescue Playbook Concept

- Pre-built “plays” (systems, techniques, approaches)
- Known strengths & limitations
- Rapid deployment with minimal discussion

Instead of:

“What should we build?”

We move to:

“Run the play.”

SME Briefing Framework

Situation

- Patient condition
- Environment
- Hazards

Mission

- Clear end state (Rescue objective)

Execution

- Roles
- System choice
- Sequence of actions

Confined Space Pre-Planning

Strong rescues start before the call.

Key considerations:

- Entry/exit points
- Dimensions (vertical / horizontal)
- Atmospheric hazards
- Energy isolation (LOTO)
- Anchor opportunities
- Equipment staging locations

CSR PrePlanning Forms		Google drive folder of forms
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Equipment Selection Principles

Avoid overbuilding. Focus on:

- **Flexibility** over specialization
- **Multi-use systems** (Maestro, ASAP, etc.)
- Lightweight, deployable systems (8mm considerations)

Key Equipment Concepts

- Team vs Individual LOTO
- Battery-powered ventilation (industrial limitations)
- Meter selection:
 - Attendant: pumped 5-gas
 - Entrant: diffusion 4-gas
 - Remote monitoring capable (Blackline, RAE)

Tripod / High Directional Concepts

Focus on:

- Resultant forces
- Maintaining stability
- Efficiency of movement
- Anchor Frame vs Directional Frame

Common Tricks of the Trade

Anchor to the Tripod

2:1 Drop Loops

- Reduces resultant forces
- Manages edge friction
- Keeps load within tripod footprint

“Meat Anchor” Applications

- Temporary tie-back
- Controlled lowering support

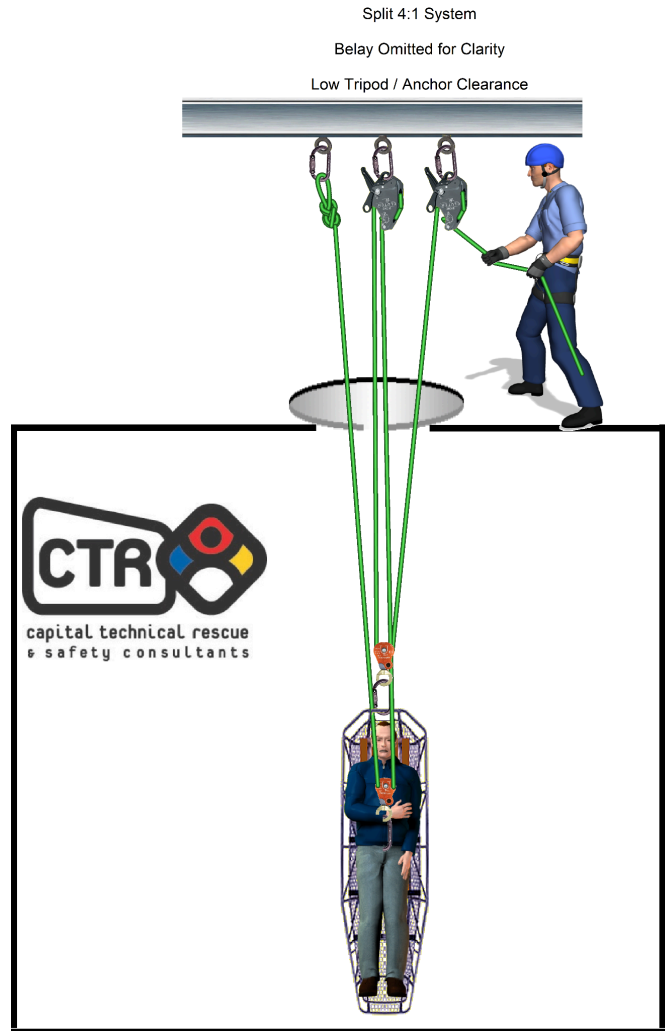
Remote Operation (Maestro)

- Reduce personnel at opening
- Improve control

System Adaptability

Build systems that can:

- Lower → Raise quickly
- Transition environments
- Scale with available personnel

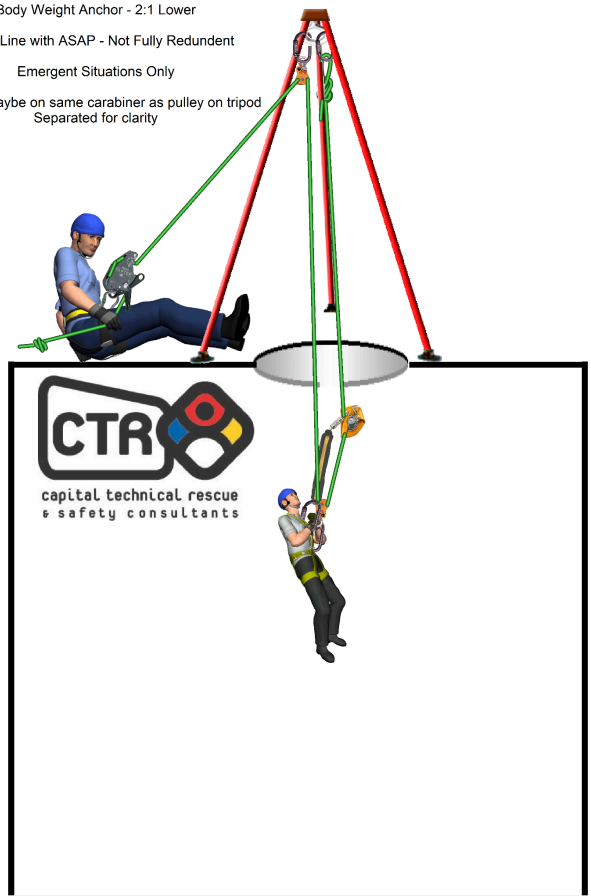


Anchoring Challenges in Industrial Spaces

Common solutions:

- Deadman anchors
 - Paratech / Vortex / Terradaptor
 - SKED / Wood 4 x 6 or 6 x 6
- Doorway anchors (RAFA / Pinzer)
- Floating anchors
- Meat Anchors
- Low Overhead Clearances
 - Split 4:1

Body Weight Anchor - 2:1 Lower
 Single Line with ASAP - Not Fully Redundant
 Emergent Situations Only
 Figure 8 maybe on same carabiner as pulley on tripod
 Separated for clarity



Patient Packaging Considerations

Ask:

- What does the patient need?
- What does the environment allow?
- What is fastest?

Not always:

- “Best package”

Often:

- “Most appropriate package”

Examples discussed:

- SKED
- Drag N Lift
- Spec Pak
- Pitagor

Time Consideration

Packaging delays = delayed patient care

Applying the Concepts

- Use **pre-plans**
- Keep systems simple
- Adapt to environment
- Focus on early patient contact

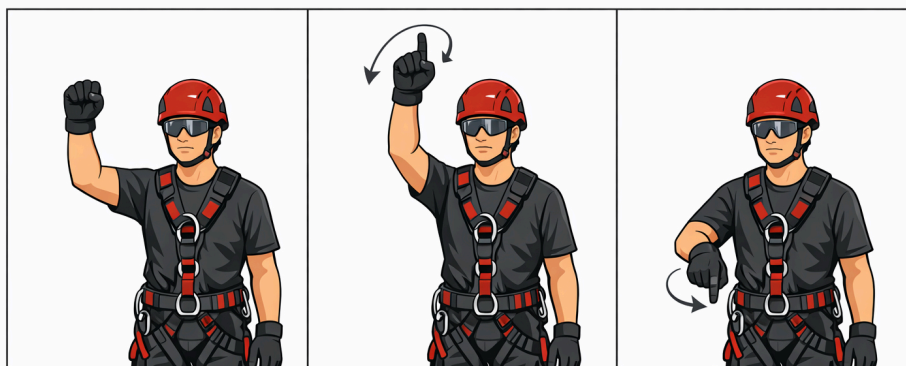
Training Takeaways

- Build systems you can deploy **quickly**
- Train with **limited personnel**
- Focus on **decision-making under pressure**

Position	Role/Responsibility	Equipment
Lead	• Command and control (may not be the overall Incident Commander) • Safety (unless a dedicated Safety Officer is assigned) • Establish communications • Liaison for other Teams/Divisions	• Command board • Portable radios • May require harness/fall restraint depending on geography
Rescuer 1	• Deploy Quick Intervention Kit (QUIK) to access patient(s) • Patient triage and stabilization • Identify and communicate additional needs • Begin patient packaging	• Harness kit • First Aid Kit (FAK) • Victim harness • Quick Intervention Kit (QUIK) • Additional hazard-specific kits as needed
Rescuer 2	• Ready appropriate patient packaging device • Ready appropriate medical equipment based on Rescuer 1 report • Raised/lowered on system to assist Rescuer 1 with patient packaging if necessary • Attend patient during movement if necessary	• Harness kit • Patient packaging device as needed • Patient comfort kit (PACK) • Additional medical equipment as needed
Rigging	• Select/build anchor(s) • Deploy system bags • Connect ropes to Rescuer 2 and/or patient packaging device • Build mechanical advantage for raise • Manage lower/raise operations	• System bags • Additional anchorage as needed • May require harness/fall restraint depending on geography
Edge	• Identify type of edge transition and associated equipment needs • Assist Rescuer 1/2 with edge transitions • IC may delegate commands to the Edge position when necessary • Assist with lower/raise operation	• Harness/fall restraint • Edge protection • AHD if necessary

Briefing Format (SME)	
SITUATION	Patient Environment Hazards
MISSION	End State Phases
EXECUTION	Assignments

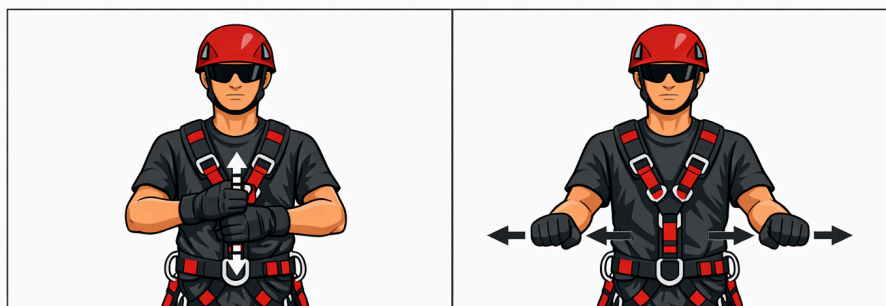
Commands	
STOP	1 Whistle Blast
RAISE	2 Whistle Blasts
LOWER	3 Whistle Blasts
TENSION	Tension by Hand
SLACK	Make Soft / Slack the Line
REPEAT COMMAND BACK (ensures it was heard correctly)	



STOP

RAISE

LOWER



TENSION

SLACK

Tripod Winch ASAP

Utilizes a CMC Triskellion tripod as a high directional anchor, paired with a Harken LokHead Winch for the mainline, providing controlled raising and lowering, and a Petzl ASAP Lock on the belay line for continuous fall protection.

Overview

Tripod

CMC Triskellion

Haul/Lower System

LokHead Winch w/tripod mount

Pitch Head Belay

1 – ASAP LOCK w/ ASAP'SORBER AXESS

Connectors

Oval Carabiners (x2)

Ropes

2 - 11mm x 300

LokHead Winch

Max Working Load for Human Suspension: 2.2 kN (485 lbs)

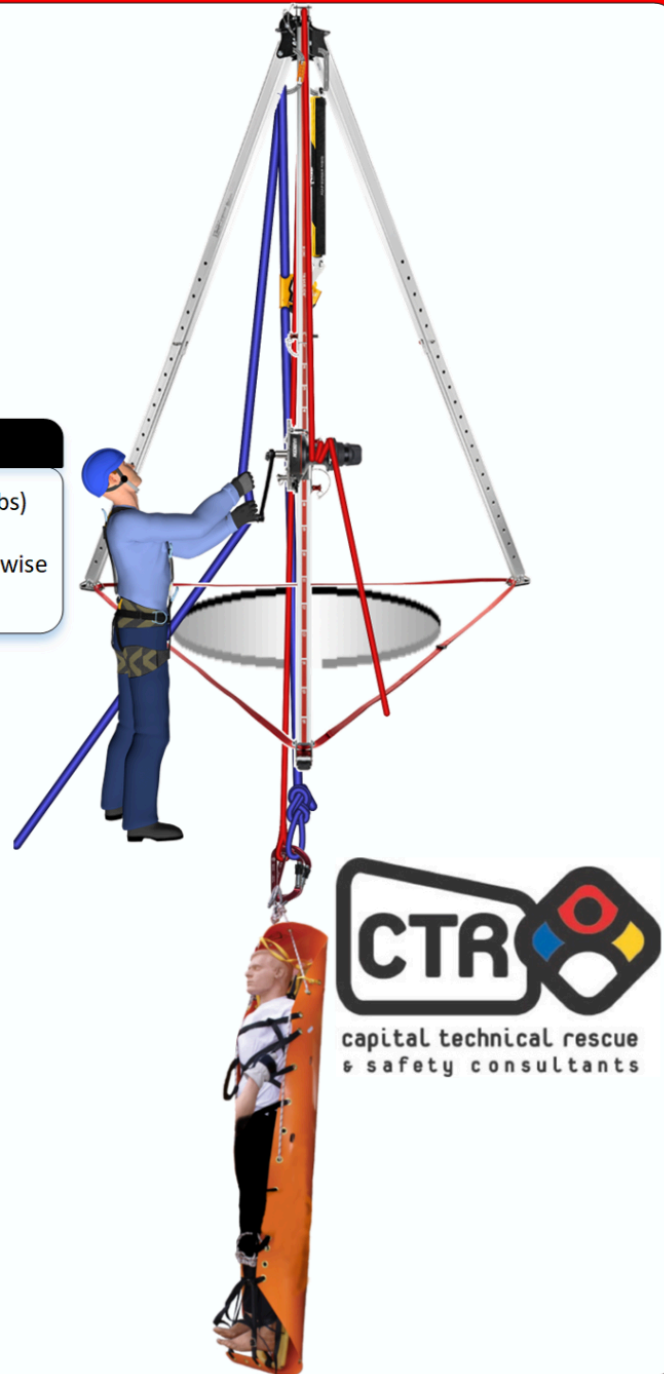
Power Ratio – 13.5:1 (1st gear) / 39.90:1 (2nd gear)

1st Gear: Faster / Less Power: turn handle counter clock-wise

2nd Gear: Slower / More Power: turn handle clockwise

Team Positions

	Lead Command
Rescuer 1	Rigging
Quick Pt Contact	Rig & Operate Systems
Rescuer 2	Edge
Pt Packaging	Assist Rescuers & Pt



System Benefits

- Highly efficient and easy-to-control raising/lowering with the Harken LokHead Winch.
- CMC Triskellion tripod offers exceptional stability and versatility, accommodating uneven terrain and confined space entry points.
- Continuous raising function without the need to reset a rope grab.
- Utilizes almost the full working length of the rope.
- Quick and straightforward setup with minimal rope management required.

Batwing (Tripod Reeve)

Ideal for confined space rescues requiring vertical entry and retrieval.
Suitable when a tripod or similar high directional anchor is available.
Effective in scenarios requiring rapid raising and lowering of the load.



Overview

Descenders
MAESTRO S
(x 2 for OP)

Pulleys
Single Swivels x 4

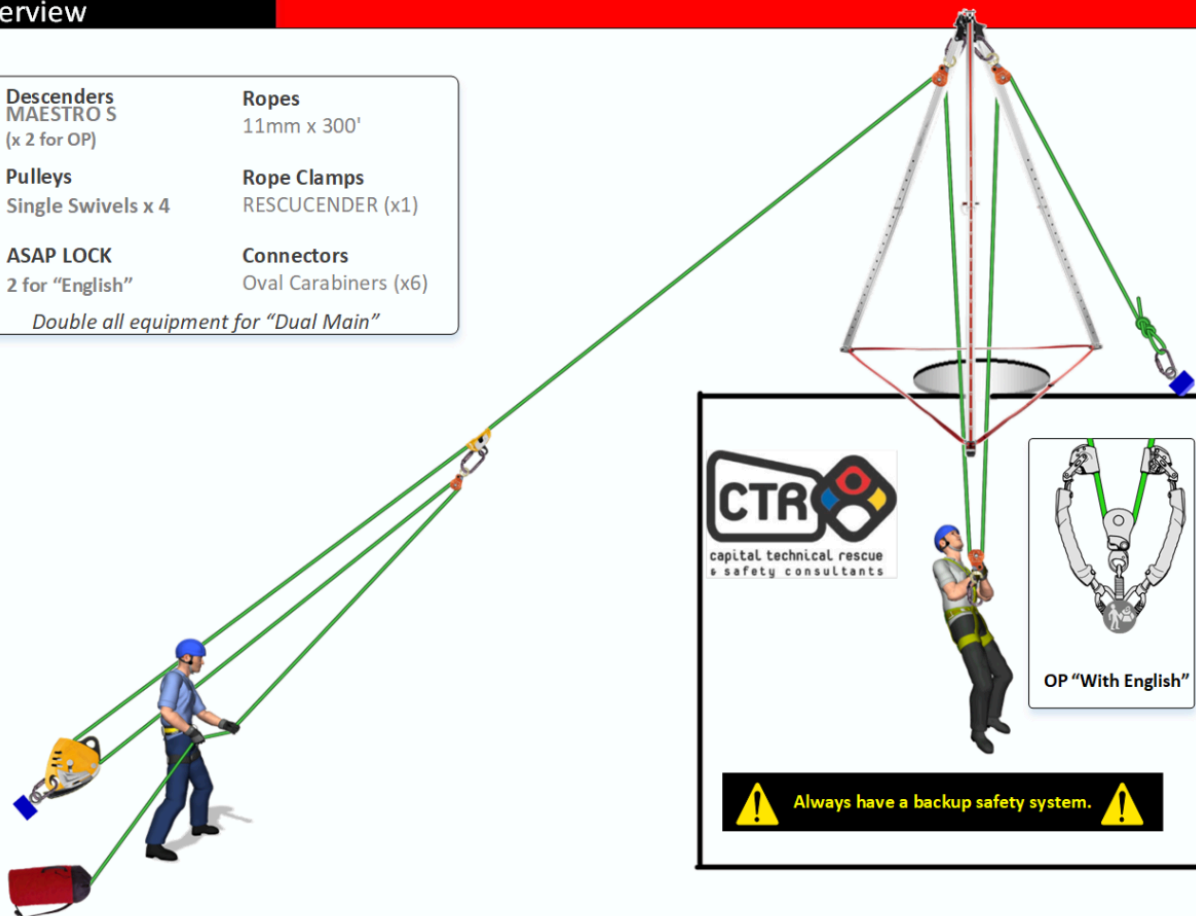
ASAP LOCK
2 for "English"

Double all equipment for "Dual Main"

Ropes
11mm x 300'

Rope Clamps
RESCUCENDER (x1)

Connectors
Oval Carabiners (x6)



System Info

Advantages

Efficient for vertical rescues requiring both raising and lowering.
Reduces edge transition challenges.
Simple setup / common team equipment.
Raising / Lowering can be done away from edge.
Can be rigged as Dual Main (TTRS)

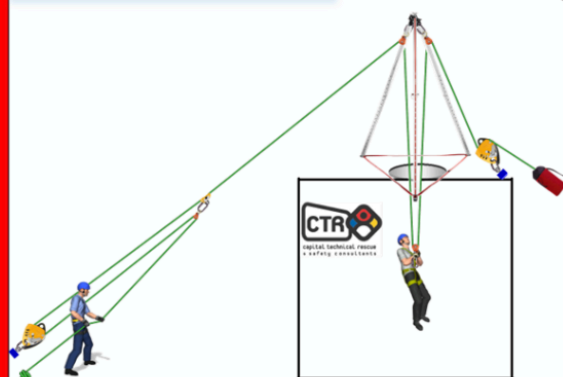
Disadvantages

Requires tripod / high point.
Can be gear intensive depending on team.

Team Positions

Lead Command	
Rescuer 1	Rigging
Quick Pt Contact	Rig Batwing / Up
Rescuer 2	Edge
Pt Packaging	Assist Rigging / Down

Option Play (OP)



"Dueling Maestros"

Allows for hauling on one side and lowering on the opposite.

"With English"

The ASAP LOCK and ASAP'SORBER AXESS can back up a system failure from either side.

Formal Briefing			Hazard		Control		Drawing	
SITUATION Patient Environment Hazards			Confined Space		☐			
			Entrapment		☐			
			Falling Objects		☐			
			Fall Risk		☐			
			Explosion		☐			
MISSION			Atmosphere		☐			
End State?			Mechanical		☐			
EXECUTION			Other		☐			
Phases			Other		☐			
Assignments			Other		☐			
ADMISTRATION			Other		☐			
Logistics			Other		☐			
CONTROL			Other		☐			
Communications			Other		☐			
Role			Assignment		☐			
Team Leader			PPE		☐			
Rescuer 1			Lighting		☐			
Rescuer 2			LOTO		☐			
Rigging			SCBA/SAR		☐			
Edge			Other		☐			
IMMEDIATE ACTION			Commands		☐			
STOP - SECURE			STOP		☐			
			1 Whistle Blast		☐			
			Up		☐			
			2 Whistle Blasts		☐			
			DOWN		☐			
TRIAGE			3 Whistle blasts		☐			
ASSESS			Tension by Hand		☐			
RESOURCES			SLACK		☐			
RECOVER			Make Soft / Slack the line		☐			
REPEAT COMMAND BACK					☐			

Continue Your Training: Building Capability Beyond Today

The techniques and concepts introduced in this program are part of a broader approach to technical rescue—one that emphasizes efficiency, decision-making, and real-world performance.

At Capital Technical Rescue, our training programs are designed to go beyond individual skills and focus on how teams operate under pressure.

Efficient Rescue Operations: Building Your Rescue Playbook

This program expands on the concepts introduced today by helping teams develop a structured, repeatable approach to rescue operations.

Key components include:

- Creating a **rescue playbook** with pre-defined systems and strategies
- Developing **personal and positional kits** that support rapid deployment
- Using the **SME (Situation, Mission, Execution)** framework to improve communication
- Establishing **performance benchmarks and time-to-task expectations**

The goal is to reduce hesitation and uncertainty so teams can move quickly from:

“What should we do?” → “Run the play.”

This program is ideal for departments looking to improve:

- Operational consistency
 - Team coordination
 - Speed and clarity in decision-making
-

Rescues Gone Wrong: Lessons from the Field

This program focuses on learning from real-world incidents where rescue operations did not go as planned.

Through case studies and facilitated discussion, we examine:

- Breakdowns in communication

- Delays in critical decision-making
- Overly complex or inappropriate systems
- Gaps between training and real-world execution

More importantly, we identify:

- **What could have been done differently**
- **How small changes in mindset or preparation impact outcomes**
- **How to build systems that are more resilient under stress**

This program reinforces a key principle:

Success in rescue is often determined **before the system is built**—in planning, communication, and decision-making.

Custom Training for Your Team

CTR offers customized programs tailored to your department's:

- Staffing model
- Equipment cache
- Response environment
- Operational priorities

Available programs include:

- Confined Space Rescue (Operations to Technician)
- Rope Rescue (Operations to Advanced Technician)
- Small Team / Minimal Staffing Rescue
- Tower and Industrial Rescue
- Standby Rescue Team Development
- Instructor Development & Evaluator Prep

Many of the challenges discussed in this program—anchoring limitations, equipment constraints, and system adaptability—are explored further in both the *Efficient Rescue Operations* and *Rescues Gone Wrong* programs.

Next Steps

Scan the QR codes below to:

- Access student manuals and resources
- View course offerings and schedules
- Connect with CTR to discuss training opportunities

CTR Student Resources

Confined Space Rescue Technician		NFPA CSR Technician ITRA Levels 1 - 3
Rope Rescue Operations		NFPA Rope Rescue Operations ITRA Levels 1 & 2
Rope Rescue Technician		NFPA Rope Rescue Technician ITRA Level 3 Technician
CTR Rules of Engagement		Operational Guidelines for Rescue Teams
CTR Tactical Worksheet		Tactical Planning & Execution Tool

Photo Gallery

Viewing:



<https://tinyurl.com/csr26midstateview>

Share Your Photos:



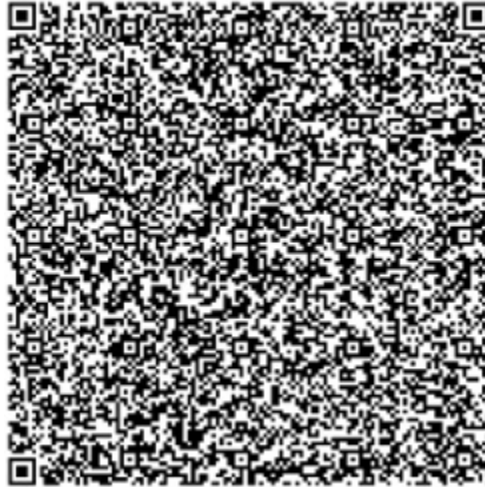
<https://tinyurl.com/csr26midstateup>

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- Upcoming courses and clinics
- Training insights and techniques
- Real-world applications and case studies
- New equipment and system innovations



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