

Confined Space

Rescue Technician



Session 2



Suffolk County
Fire Academy

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Session Overview

Confined Space Rescue


- **Statistics, Standards, Definitions**
- **Response Plan & Incident Command System**
- **Confined Space Rescue Personnel**
- **Personal Protective Equipment (PPE)**
- **Patient Removal Equipment.**



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Course Objectives (CST)

- **Initiate a search inside a confined space in those area immediately visible from the confined space entry portal (NFPA 1006 7.2.1)**
- **Perform size-up of a confined space rescue incident to identify potential hazards to victims and rescuers (NFPA 1006 7.2.2)**
- **Describe and demonstrate air monitoring of the environment (NFPA 1006 7.2.3)**
- **Demonstrate ongoing assessment of the incident to include hazard identification, victim condition and location, risk/benefit analysis, methods of ingress and egress are identified, rescue systems are determined, and emergency means of retrieval for rescue entrants is established (NFPA 1006 7.2.4).**



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Course Objectives (CST) Cont'd


- Apply and use self-contained breathing apparatus (SCBA) as a rescue entrant (NFPA 1006 7.2.6)
- Prepare for and enter a horizontally oriented confined space for rescue (NFPA 1006 7.2.9, 7.2.10)
- Package a victim in an appropriate patient packaging device, considering spinal immobilization, and remove them from a horizontally oriented confined space (NFPA 1006 7.2.8, 7.2.11)
- Prepare for and enter a vertically oriented confined space for rescue (NFPA 1006 7.2.13, 7.2.14).



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Course Objectives (CST) Cont'd

- Package a victim in an appropriate patient packaging device, considering spinal immobilization, and remove them from a vertically oriented confined space (NFPA 1006 7.2.8, 7.2.15, 7.2.16)
- Initiate a search inside a confined space in those areas not immediately visible from the confined space entry portal (NFPA 1006 7.3.1)
- Apply and use supplied-air respirators (SARs) as a rescue entrant (NFPA 1006 7.3.3)
- Prepare for and enter a confined space with atmospheric hazards (NFPA 1006 7.3.4, 7.3.5)
- Demonstrate the use of short immobilization devices within a confined space (NFPA 1006 7.3.4).



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Session Objectives Confined Space Rescue

- Understand statistics, standards and definitions regarding Confined Space Rescue.
- Identify the components of a Confined Space Rescue Incident including:
 - Personnel
 - Personal Protective Equipment (PPE)
 - Patient Removal Equipment.



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**STATISTICS, STANDARDS,
DEFINITIONS**



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OSHA Statistics


- **Almost 240,000 Establishments With 4.8 Million Permit Required Confined Spaces**
- **1.6 Million Workers Enter These Spaces**
- **Average of 120 Fatalities Per Year**
 - 148 Killed In 20178
 - Up to 60% are would-be rescuers ←
- **5,900 Lost Work Day Accidents Per Year**
- **7,000 Non-Lost Work Day Accidents Per Year.**



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Standards


- **OSHA 1910.146** – Permit Required Confined Spaces For General Industry
- **OSHA 1910.147** – Control of Hazardous Energy
- **ANSI/ASSE Z117.1** – Safety Requirements for Entering Confined Spaces
- **NFPA 350** – Guide For Safe Confined Space Entry and Work
- **NFPA 1005** – Standard For Technical Rescue Personnel Professional Qualifications
- **NFPA 1670** – Standard on Operations and Training for Technical Search and Rescue Incidents.



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OSHA 1910.146

- **Applies To Any Employee Who Enters Confined Spaces**
- **Requires Employer To Develop Formal Programs For Entry**
 - Training
 - Documentation
 - Safety procedures
 - Maintenance of records.



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OSHA 1910.146

- **Defines Permit And Non-permit Required Confined Spaces**
- **Outlines Minimum Safety/PPE Requirements For All Entries**
- **Requires Designation Of C.S. Rescue Team**
 - On-site team of employees
 - Local fire department.




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Confined Space Definition

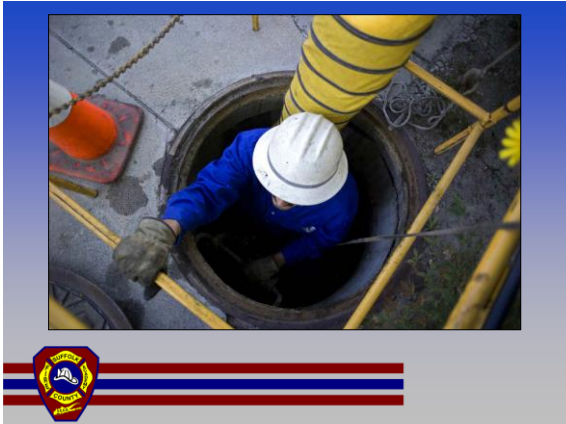
1. **Is Large Enough And Configured So Someone Can Enter And Work**
2. **Has Limited Or Restricted Entry Or Exit**

AND

3. **Is Not Designed For Continuous Occupancy.**



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Permit Required Confined Space

- **Has One or More of The Following Characteristics:**
 - Hazardous atmosphere
 - Engulfment Hazard
 - Space tapers to a smaller cross-section that could entrap or asphyxiate an entrant
 - Any other recognized serious safety or health hazard.



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Permit Required

Hazardous Atmosphere

Narrowing Container

Engulfment Hazard



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Necessary Information For Entry Permits

- Identify Space To Be Entered
- Purpose Of The Entry
- List Authorized Entrants
- List Entry Supervisor
- List Known Hazards Of Space
- List Methods Used To Isolate Hazards.



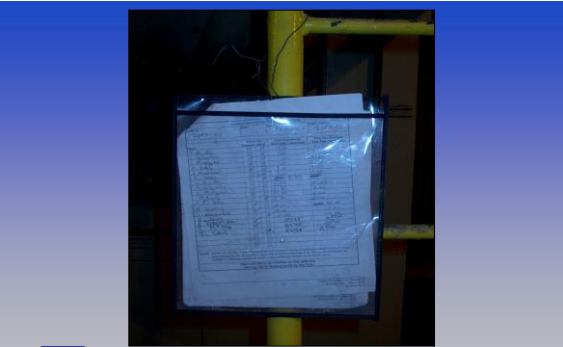
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Necessary Information For Entry Permits

- Results Of Initial and Periodic Atmospheric Testing
- Serial Number And Last Calibration Date Of Monitoring Device
- List Any Safety Or Protective Equipment Used.



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Non-permit Required Space

- Meets The Definition Of A Confined Space
- Contains No Recognized Safety Hazard
- Hazards That Do Exist Can Be Isolated Or Eliminated
 - Control of atmospheric hazards through ventilation is not considered hazard elimination.



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The Permit or Non-permit Determination Should Dictate The Magnitude and Speed of Any Rescue Operation.



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Required Rescue Team Training

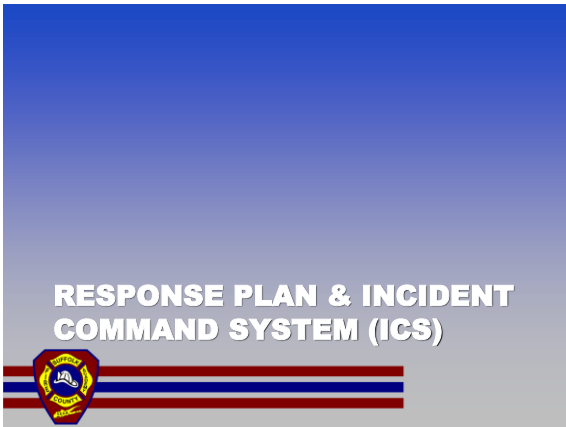
- Rescue Teams Must Be Trained In The Following Disciplines:
 - Personal protective equipment (PPE)
 - Rescue equipment
 - Duties assigned to the individual
 - Simulated rescues from actual or representative spaces on an annual basis (Annual Refresher)
 - First aid and CPR.



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Response Plan Components

Department Response Levels

- Primary Response Team
- Backup Response Team
- First Responder
- Support Response
- No Response.




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Response Plan Components

Personnel Requirements

- Selection of Personnel
- Duties of Individuals And/or Companies
- Training
- Incident Command
- Resources.




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Response Plan Components

Equipment Requirements

- Types of Equipment Needed Based On Response Level
- Availability Of Equipment.




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CONFINED SPACE RESCUE PERSONNEL



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Roles of Confined Space Rescue Personnel



- Attendant – Outside Operations
- Entrant – Rescuer (Entry Team)
- Supervisor – Command (Ops).



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Confined Space Roles

- Attendant:
 - Someone who stays outside the space and monitors conditions.

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Attendant

- Serves As Buddy To Entrant
- Stays Outside Confined Space Observing Site Conditions
- Knowledgeable With Hazards Of C.S.
- Able To Recognize Signs Of Exposure
- Keep Accurate Count Of Workers Who Have Entered The C.S.
- Stay In Continuous Contact With Entrant.



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Attendant (cont.)

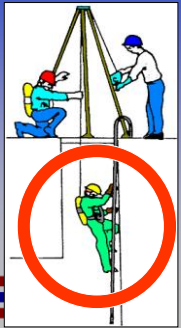
- Cease Operations And Order All Entrants From The Confined Space If Any Of The Following Are Observed.
 - Conditions not allowed by entry permit
 - Signs of exposure in any entrant
 - Something observed outside of the space which could harm the entrants
 - If you must leave your post for any reason.



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Confined Space Roles

- Entrant:
 - One who enters the confined space.



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Entrant

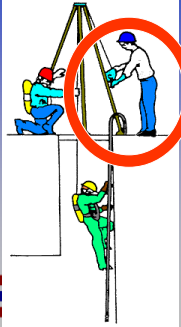

- One Who Enters The Confined Space
- Responsibility Towards Safety
- Know The Hazards Of The Confined Space
- Aware Of Signs Of Exposure
- Follow Procedures For PPE
- Maintain Contact With Attendant
- Stay Alert & Be Ready To Evacuate If Ordered.



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Confined Space Roles

- **Supervisor:**
 - Is responsible for entry permit and safety.

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Confined Space Supervisor

- Authorizes Entry
- Ensures All Work Conditions Are Safe
- Writes The C.S. Permit & Terminates Permit
- During Entry, Responsible For Checking Conditions To Assure That They Remain Safe
- Check Lockout / Tag Out Devices Have Been Applied/Removed.



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PERSONAL PROTECTIVE EQUIPMENT (PPE)



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Body Protection

- Structural Fire Fighter Clothing
- Coveralls
- Chemical Protective Clothing.






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Respiratory Protection

- Air Purifying Respirator
- Self Contained Breathing Apparatus
- Supplied Air Respirator.







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Respiratory Protection




**Confined
Space
"Gunslinger"**



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SAR Vs. SCBA

- SAR Has Unlimited Air Supply
- SCBA User May Experience "Cave Diver Syndrome"
- SAR Is Low Profile And Maneuverable
- SCBA Use Should Be Limited To Spaces Which Do Not Require Its Removal To Enter.



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PATIENT REMOVAL EQUIPMENT



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PATIENT REMOVAL

- **Hasty Harness / Girth Hitch**
 - Drag / webbing
- **Packaging**
 - LSP / SKED / Reeves Sleeve / stokes
- **Removal**
 - Rope system / manual.



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PATIENT REMOVAL


- **Plan Route**
 - **Make sure it fits!!!**
- **Coordinate Movement**
- **Let Outside Teams Help**
 - Haul teams
- **Rescuer Placement**
 - Try not to be blocked in!



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RESCUE Vs. RECOVERY

- *Always Perform A Thorough Risk / Benefit Analysis*
- **If Need For Rescue Is Urgent, And Entry Can Be Safely Accomplished With Equipment On The Scene, Live Rescue May Be Attempted Prior To Rescue Team Arrival.**



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Risk Vs. Benefit

- **Largest Risk?**
- **Death Of The Rescuer**
- **60% Of Deaths Are The Would Be Rescuer. That's 2 Out Of 3!**
- **Many Of These Incidents Are Multiple Deaths**
- **Goal Of The Rescue Is To Save A Life**
- **We Do Not Trade Rescuers Lives For Victims Lives.**



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Uses of Mechanical Advantage Systems

- **Raise Loads**
- **Lower Loads**
- **Horizontal Movement of Loads.**




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Mechanical Advantage Equipment

- **Site Constructed Equipment**
 - **Standard rope rescue equipment**
- **Manufactured Systems**
 - **Power winch (NEVER USE)**
 - **Tripod winch**
 - **Tube winch**
 - **Rope systems.**



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Manufactured Tripod



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Ladder Gin – A Frame

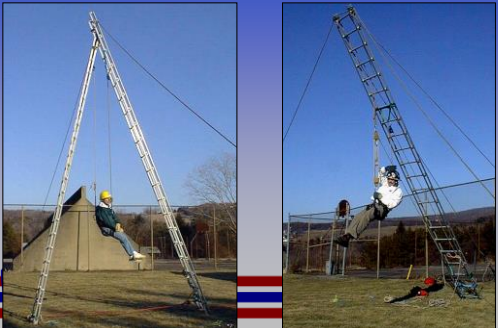


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Ladder Rescue Systems

Ladder A Frame

Ladder Gin



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