

## **COURSE: NR-33 – TRAINING IN TECHNICAL RESCUE FOR EMERGENCY AND RESCUE TEAM IN CONFINED SPACES – OPERATIONAL LEVEL (AND ALSO INDUSTRIAL LEVEL)**

### **SCOPE AND APPLICABILITY:**

This training aims to establish the minimum conditions for the composition, formation, implementation, training and recycling of the emergency response team, to act in the rescue in confined spaces. Specified rescue skill level for which the person is qualified to participate in a limited range of confined space rescue, positioned from a surface that requires safe displacement through movement restriction personal protection systems, falls and positioning for vertical movement of victims and rescuers, in scenarios using assembled systems with mechanical advantage, pre-engineered or pre-assembled, manual or automatic rescue systems, with notions of executing different progressions by means of rope, mechanical and electrical systems, specific for moving and rescuing people. It includes the full content of the Industrial level.

### **REGULATIONS & STANDARDS**

- NR-01 - General Provisions;
- NR-33 – Occupational Safety and Health at Work in Confined Spaces;
- NR-35 - Work at heights;
- NBR15595 - Rope access - Procedure for Applying the Method
- NBR16577 - Confined Space - Accident Prevention, Procedures and Protection Measures;
- NBR16710 - Industrial Technical Rescue at Heights and Confined Spaces;
- ES Military Fire Brigade (CBMES) - Rescue at Height Handout
- Resolution A.1050 (27);
- MSC. 1 / Circ.1401;
- Regulations (Standards - 29 CFR) - 1910.146.

### **COURSE CONTENT:**

- Official regulatory norms and applicable Brazilian norms;
- Safety principles of a rescue operation;
- Desirable requirements for rescuers
- Identification of risks associated with a rescue operation;
- Risk-benefit assessment in a rescue operation;
- Certification of rescue equipment and systems;
- Selection and correct use of the following personal rescue equipment:
  - Safety harness;
  - Suspensors;
  - Slings or lanyards;
  - Fall arrestor;
  - Stirrup;
  - Connectors;
  - Helmet;
  - Gloves;
  - Descender;
  - Lifts;
  - Overalls;
  - Boots;
- Techniques for vertical movement of victims and installation and operation of pre-engineered or pre-assembled manual or automatic rescue and evacuation systems and simple mechanical advantage systems
- Selection and correct use of the following collective rescue equipment:
  - Gas detectors;
  - Ropes;
  - Slings, ring, straps or anchoring straps;
  - Connectors;
  - Pulleys;
  - Blockers;
  - Stretchers;
  - Tripod;
  - ventilation systems
  - Locking systems
  - Area isolation systems
  - Assembly of basic stringing knots (blocking, finishing, splicing, anchoring and securing);
  - Assembly of simple and semi-equalized anchorages with stringing knots;
  - Effect of angles formed by anchorages on load distribution;
  - Assembly and operation of simple mechanical advantage systems (block);
  - Pre-use inspection of individual and collective rescue equipment used;
  - Identification of conditions of operational readiness or damage, defects and wear and tear for rejecting equipment that has been disapproved according to manufacturers' instructions;
  - Methods for cleaning, packing and transporting rescue equipment;
  - Conceptualization of the shock force generated by arresting a fall from a height;

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- Conceptualization of fall factor and free fall zone;
- Knowledge of how inert suspension trauma develops and its main therapeutic measures;
- Use of available means of communication, as well as use of terminology used as standard language for emergencies;
- Knowledge of the different types of vertical transport stretchers, as well as their compatibility for the type of operation or victim's injury;
- Techniques for immobilizing victims on stretchers, with or without the use of spine or limb immobilizers;
- Basic stretcher handling techniques (vertical, horizontal and land);
- Basic rope progression techniques: ascent and descent;
- Technical factors that affect the effectiveness of a rope and confined space rescue
- Techniques for using respiratory protection equipment applied to rescue;
- Redemption procedures;
- Analysis of accident cases during rescues;
- Practice: simulation of possible accident scenarios, identified from risk analyses.

## **COURSE DESIGN:**

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Theoretical – 12 hours

Practical – 12 hours

**TOTAL:** 24 hours

## **PREREQUISITE(S):**

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- Have legal responsibility i.e., be over 18 years of age;
- Be literate, that is, have at least completed elementary school or high school;
- Valid NR-33 (authorized worker, watchman or supervisor) training;
- Valid Work at Heights training according to Brazilian NR-35;
- The compliance with the previous items guarantees compliance with the requirement of having basic knowledge in first aid.
- Possess good physical condition and good health (valid ASO that includes the tasks of a rescuer);
- It is desirable: To have previous experience as a rescuer and have good knowledge of the facilities, preferably employees in the area of utilities, electrical, hydraulic and general maintenance should be chosen.

## **MINIMUM/MAXIMUM NUMBER OF DELEGATES**

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This course requires a minimum of 3, and a maximum number of 12 trainees.

## **MAIN SAFETY ISSUES:**

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- Claim Recognition and signs of abandonment;
- Careful handling of gas detectors, rescue equipment at height;
- Care in moving and guiding the personnel involved and the victims;
- Group positioning in firefighting.

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**REQUIRED EQUIPMENT:**

- Space with structures compatible with carrying out simulated rescue exercises;
- Gas detectors;
- Paratrooper belt;
- Lanyards;
- Fall arrest device;
- Tripod installed with rescue winch;
- Self-contained breathing apparatus (SCBA);
- Autonomous set for escaping;
- Communicating radios;
- Connectors;
- Descender;
- Lifting equipment;
- Ropes;
- Pulleys;
- Slings, anchor rings, tapes or straps;
- Ventilation systems;
- Locking systems;
- Area isolation systems;
- First aid materials: Splints, cervical collars, stretchers, Manual Respirators (AMBU), etc.

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**PROCEDURE FOR PRACTICAL EXERCISES:**

- Demonstration of the use of EX-certified Equipment and its importance for confined spaces;
- Use and demonstration of gas measuring equipment;
- Simulation of pre-entry practices: Risk analysis, ventilation equipment (if any), gas testing, etc;
- Practical demonstration of confined space entry equipment: Mounting and handling tripods, guide wires, safety belts, fall arresters, etc.;
- Simulation of entry into confined spaces (in a situation and in a controlled environment, never in a confined space that has identified substantial risks);
- Simulation of the use of different communication methods between workers;
- Positioning and demonstration of rescue equipment;
- Clarifications on the use of the Entry and Work Permit;
- Descent and removal of the victim;
- In the first aid part, a demonstration will be done with a dummy or volunteer on how to perform immobilization, transport and positioning for CPR and ventilation, as well as demonstration of related equipment such as stretcher, respirator, splints, etc.

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**CERTIFICATION:**

Training certificate signed by responsible Engineer accredited by Brazilian CREA.



**EVO**

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## **CERTIFICATE VALIDITY PERIOD:**

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- 2 years, or in the following situations:
  - a) When there is a change in work procedures, conditions or operations, which imply a change in occupational hazards;
  - b) In the event of a serious or fatal accident, which indicates the need for new training;
  - c) After returning from work leave for more than 180 (one hundred and eighty) days;
  - d) When deviations are identified in the rescue operation or in the simulations.