



EXCLUSIVE CONTENT

Confined Spaces Present Difficult Rescue Challenges

APRIL 16, 2014

By *United Safety*

Confined spaces are very complex locations to work in. Conditions inside can be difficult to determine and can change quickly, resulting in the injury or death of workers. These spaces can be boilers, storage tanks, pipelines, process vessels, pits, reaction vessels, ventilation ducts, or many others.

Accidents occur because of unmanaged potential hazards, such as fire or explosion, elevated temperatures, gas, fumes, vapor or lack of oxygen, physical barriers, and limitations to movement and exit. These conditions may already be present or may arise from work being conducted inside or near the confined space.

The team in charge of turnaround safety must be present for early discussions, and a thorough site-needs assessment should be performed to evaluate necessary confined-space work, its risks, and plans to mitigate those risks.

Safe work practices must be developed, and previously conducted risk assessments may dictate what precautions are necessary (e.g., ventilation, personal protective equipment, safety lines). Conditions must be monitored continuously to determine if any new hazards arise from the activities being performed. To ensure these safety measures are put into practice, everyone involved must be properly informed and trained.

If emergencies occur despite these safety measures, the window for reaction is very limited; these hazards can be fatal in a short time of exposure. Lack of oxygen, for instance, will lead to brain damage or death within a mere 5 minutes.

Confined-space rescues are challenging because of the environments themselves. The spaces can be narrow and constricting, often hindering access by rescuers. If a well-defined rescue plan is not in place, rescue will consist of an emotional reaction to an urgent situation, which often leads to poor results.

A rescue procedure is more than just another industry requirement or a box to check. It is a detailed plan that, when understood and applied properly, will prevent serious catastrophic events. The procedure should be defined per specific confined space, identifying all of its characteristics and defining all the steps to be taken in the event of an emergency. The parties involved should review and amend the plan until they are satisfied that it is safe, practical, and repeatable. It should be practiced often to ensure a swift and calm response.

One example of best practice in confined space safety and rescue planning was presented at the 2014 SPE International Conference on Health, Safety, and Environment, held in Long Beach, California, from 17 to 19 March. The technical paper “Safe Work Practices and Rescue Planning for Vertical Column Work During Turnaround: A Case Study” portrayed a turnaround case



Emergency Response Technicians demonstrate a confined-space rescue procedure.

Workers stand on a mock-up simulator for confined-space rescue.

study that involved cleaning and repairing a vertical column 60 ft high and 3 ft wide, with the only entry point being an 18-in.-wide manway. A major concern was how to rescue an incapacitated crew member from inside the column.

A mock-up structure was built to simulate one ring section of the column, which the team used to study and test all the possibilities to come up with the best rescue plan. Several practice rounds ensured the rescue personnel were comfortable with all aspects of this coordinated exercise and that the plan was viable and repeatable.



[Download the paper “Safe Work Practices and Rescue Planning for Vertical Column Work During Turnaround: A Case Study” from OnePetro here.](#)

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