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Naval Facilities Engineering Command

Abstract of an Accident

99-05

ACCIDENT TYPE: Underground Storage Tank (UST) Removal
INJURY: N/A (Near Miss)
TYPE OF WORK: Remedial UST Removal
EQUIPMENT: Excavator

DESCRIPTION OF INCIDENT:

During the extraction process of a 6,000-gallon fuel oil storage tank a worker slid into an excavation. The tank was being pulled out of its resting-place approximately 4 feet below grade. As the excavator equipment began pulling, the tank popped up abruptly. This sudden popping-up caused a void in the earth where the tank had been located which the surrounding gravel and soil material rapidly displaced. A worker was standing approximately six to eight feet back from the edge of the excavation when this occurred. The earth he was standing on began to slide toward the tank void causing him to enter the excavation. Sloping of the excavation had been performed even though employees were not entering the excavation.

DIRECT CAUSE:

The sudden displacement of the soil and gravel material in the space where the tank was removed caused surrounding earth material to suddenly fill the void created by the extracted tank.

LESSONS LEARNED:

Sloping/shoring must consider the soil that could slide into the void created by tank removal operations. Employee safe clearance must be maintained. Recommend the following be considered to safeguard personnel and property during UST removal operations. To calculate the safe clearance distance, the angle of repose should be calculated using the bottom of the tank location as the base point. This distance created by the triangle hypotenuse should be maintained as the safe clearance distance for personnel and equipment. Normally, the base point or excavation bottom depth, using the bottom of the tank, will be greater than the five-foot maximum depth provided by OSHA for requiring sloping. Using the top of the tank as the bottom of the excavation or base point of the slope does not consider the void created by the tank and the surrounding spoil material necessary to fill the void. The safe distance from the edge of an excavation which sides are supported by shoring shall be as required by USACE EM 385-1-1 and provided with perimeter protection.

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