SP-20

National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation P-294A

Date: October 3, 1989
In reply refer to: P-89-9

Mr. Bide Thomas
President
Commonwealth Edison
1st National Bank Building
1 First National Plaza
Chicago, Illinois 60690

On August 31, 1988, a North Shore Gas Company (NSG) crew struck and ruptured a fitting on a 4-inch plastic gas main in Green Oaks, Illinois. While the crew was attempting to excavate a nearby valve to shut off the flow of gas, the backhoe struck an unmarked power cable. The gas ignited and four NSG employees were injured. 1/

On July 11, 1988, during its annual inspection of emergency shutoff valves, an NSG crew noted that the valve box and marker pole for a 4-inch valve (M4148) beside Buckley Road in Green Oaks, Illinois, had been struck and needed to be reset. On August 29, 1988, NSG notified JULIE, a one-call excavation notification system, of its intent to excavate on the south side of Buckley Road 580 feet east of its intersection with Saint Mary's Road. The local telephone company and electric power company, Commonwealth Edison, responded to the notification.

On August 31, 1988, a two-person NSG crew--a distribution operator (DO) and a helper--received a valve inspection form, which also served as their work order for repairing the valve box and marker pole. The form reported the location of the valve, its number, when it was inspected, a description of the valve--including its size, and remarks made by the initial survey crew.

Arriving at the work site on Buckley Road about 9:45 a.m., the NSG crew noted the marks made on the ground by the telephone company and Commonwealth Edison, indicating there were no telephone or electric lines in the area of the planned excavation. Believing that the valve box to be repaired was on the 6-inch, east-west steel main that ran parallel to and adjacent to the south curb of Buckley Road, the DO did not

1/ For more detailed information, read Pipeline Accident/Incident Summary Report--"Green Oaks, Illinois, August 31,1988" (NTSB/PAR-89/01/SUM).

consult the gas system map carried in the service truck. The valve and valve box actually were located on a 4-inch plastic main about 5 1/2 feet south of its connection to the 6-inch, east-west main. Following standard practice, the DO and helper swept the area with a pipe locator. Because the DO believed the valve was on the east-west main, the sweep was made south from the edge of the road. During the sweep, the crew recognized an interference with the signal from the pipe locator. The DO assumed that an overhead electric power line was the cause and that the main extended east and west from the valve box. The DO decided to excavate with a backhoe to the depth of the line in an area south of and adjacent to the valve box. He planned to excavate with the backhoe no closer than 18 inches to the east-west main. About 10:30 a.m., after excavating to a depth of about 4 feet, the teeth of the backhoe struck and punctured a steel-to-plastic transition fitting on the 4-inch plastic gas main.

With gas blowing at 35 psi from the punctured 4-inch plastic main, the helper ran to the truck to radio the crew's supervisor; the crew supervisor could not be reached. The DO went to the truck and radioed the distribution office; he reported they had punctured a line, were unable to contact the crew supervisor, and requested assistance. The distribution office connected the DO with the crew supervisor by radio, and the DO explained the situation. The crew supervisor advised that he was unable to respond to the site because he had to remain at another site until it could be made safe. While the crew supervisor attempted to radio another supervisor to request response to the scene, a third supervisor interrupted the radio transmission advising that he would respond. A two-person regulator crew in the area also heard the radio conversation and responded to the scene.

When the responding supervisor arrived, within 10-15 minutes, he reviewed the gas system map he carried. From his map, he identified the location where they were working, determined there was a 4-inch, plastic main south of the 6-inch, east-west main, and determined the valve box needing repair was on the 4-inch main. He stated that because he was unable to find emergency shutoff valves indicated on his map he decided the best action would be to finish excavating valve M4148 so it could be closed to stop the flow of gas from the north. He also sent a member of the regulator crew to the NSG shop for a tool to be used to squeeze closed the plastic pipe, which would stop the flow of gas from the south.

The crew supervisor arrived about 11:20 a.m., and then walked to the area of the valve to supervise the excavation. He sent the helper to locate and mark the plastic main on the south side of a dirt berm located between Buckley Road and a housing development to the south. Using the backhoe, the DO began removing the dirt adjacent to the valve while one of the regulator crew and the responding supervisor removed dirt from the ditch with shovels. When the excavation had almost reached the level of the valve, the crew supervisor told the men in the ditch to get out so the backhoe could remove one more bucket of dirt. Kneeling at the side of the ditch, the crew supervisor instructed the DO where to place the backhoe bucket. As the DO retracted the backhoe bucket, it snagged an unmarked, underground electric line and broke it. The escaping gas then ignited.

Other gas company employees--including the general distribution supervisor--en route to the scene before the gas ignited, arrived and shut off gas to the area by closing emergency valves at the intersection of Saint Mary's Road and Buckley Road and at the intersection of Buckley Road and Oplane Road. The location of these valves were shown on a gas system map carried by the general distribution supervisor. All gas was stopped by 12:30 p.m. when the 4-inch plastic main was squeezed closed. Four persons--the two supervisors, the DO, and the second member of the regulator crew--received burns as a result of this accident; three were treated and released from the hospital and the fourth was hospitalized overnight for observation.

The Safety Board's investigation revealed that the electric line that was hit by the NSG crew was shown on Commonwealth Edison's maps. These maps were available to the employee that responded to the one-call notification as was an instrument for detecting buried electric cables. However, for undetermined reasons, the electric company employee incorrectly marked the area of NSG's proposed excavation as being free of underground power lines. The Safety Board believes it essential for public safety that employees responsible for locating underground facilities be thoroughly trained in the use of maps and locating equipment to ensure that the presence of underground lines are correctly marked.

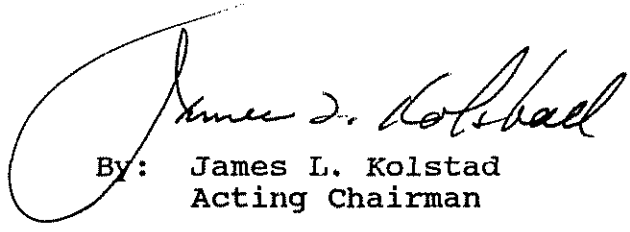
Therefore, as a result of its investigation of this accident, the National Transportation Safety Board recommends that Commonwealth Edison:

> Evaluate the training of employees responsible for locating underground electric lines to determine if it provides adequate knowledge to identify and locate underground facilities and that it stresses the importance to public safety of correctly locating such facilities; correct any deficiencies found. (Class II, Priority Action) (P-89-9)

Also, the Safety Board issued Safety Recommendation P-89-7 and -8 to North Shore Gas Company.

The National Transportation Safety Board is an independent Federal Agency with the statutory responsibility " . . . to promote transportation safety by conducting independent accident investigations and by formulating safety improvement recommendations" (Public Law 93-633). The Safety Board is vitally interested in any actions taken as a result of its safety recommendations and would appreciate a response from you regarding action taken or contemplated with respect to the recommendations in this letter. Please refer to Safety Recommendation P-89-9 in your reply.

KOLSTAD, Acting Chairman, LAUBER, NALL, and DICKINSON, Members, concurred in this recommendation. BURNETT, Member, did not concur.



By: James L. Kolstad
Acting Chairman