U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 90-002

Docket No. 030-20787

License No. 29-21452-01 Priority C1 Category 1

Licensee: Consolidated NDE, Inc.
6 Woodbridge Avenue
P.O. Box 593
Woodbridge, New Jersey 07095

Facility Name: Consolidated NDE, Inc.

Inspection At: A Radiographic Fieldsite in East Vineland, Cumberland County, New Jersey

Inspection Conducted: April 25, 1990

Inspectors: Thomas K. Thompson, Senior Health Physicist — 12/10/90 date

James P. Dwyer, Health Physicist — 12/12/90 date

Approved by: John R. White, Chief
Nuclear Materials Safety Section C — 12/12/90 date

Inspection Summary: Special unannounced safety inspection conducted on April 25 and 27, 1990 (Report No. 030-20787/90-002).

Areas Inspected: Observation of Radiographic Operations, Instruments, Equipment, Devices and Management Meeting.

Results: Six apparent violations were identified: Failure to maintain direct surveillance over the high radiation area during radiographic operations; Failure to adequately survey the entire circumference of the exposure device and the entire length of the guide tube after each exposure; Failure to survey the perimeter of the restricted area; Failure to adequately post the radiation area and high radiation area; Failure to lock the sealed source in the shielded position when the radiography source is returned to the shielded position; Failure to establish a restricted area.

DETAILS

1. Persons Contacted

*C. J. Williams - President
*J. Lee Ballard - Chief Executive Officer
Tony Andrews - Radiographer
Tony Carbone, Sr. - Assistant Radiographer
Walter Russell, Business Representative, Union of Operating Engineers
Clayton Todd, Inspector, South Jersey Gas Company
Manuel Patusio, Superintendent, Onshore Construction Company
Rudy Carr, Employee, Onshore Construction Company

*indicates those present during exit interviews via telephone

2. Observations of Radiographic Operations

On April 25, 1990 radiographic operations were observed at a temporary job site just north of Route 552 on Union Road in East Vineland, New Jersey. The site was a South Jersey Gas pipe line operation. At least twelve exposures were observed.

Radiography was observed from approximately 12:30 p.m. to 2:00 p.m. The Radiographer's Assistant handled the equipment throughout this time while the Radiographer moved his truck along the pipeline or developed the films in the darkroom within the truck. The pipe being radiographed was suspended above the ditch into which it would be placed. Three exposures were made on each weld at seams every 42 feet. The pipeline was running along the shoulder of a country road with minimal traffic.

Inspector's observation points included a wooded area approximately 200 feet away from the roadway on the side of the road where the pipeline was being installed, and a second area approximately 200 feet down the length of the pipeline on the opposite side of the road but along the shoulder of the road. Nine exposures were observed from the wooded area and three exposures, with an unobstructed view, on the same side of the pipeline where the Radiographer's Assistant was working. Binoculars and a micro-R meter were utilized to facilitate observations and determine when source movement occurred while observations were made from the wooded area.

The inspectors made the following observations:

a. No radiation signs or high radiation signs were visible or posted on the side of the pipeline toward the wooded area. This was a residential area and a home was located parallel to the pipeline approximately 100 feet from the radiography equipment.

Individuals exiting the front door of the house would not have observed a sign. Three caution radiation signs were posted on the side of the pipeline facing the road and in the direction of oncoming

traffic in one direction and four caution radiation signs were posted on the rear of the radiography truck facing the oncoming traffic from the other direction. These signs were approximately 170 feet from the radiography equipment. Two folding high radiation signs were placed eight feet from the exposure device observable only from the road side of the pipeline.

b. The Assistant Radiographer did not lock the exposure device prior to handling the collimator and guide tube between successive exposures on each pipe seam. The inspectors could not determine if the exposure device had been locked prior to moving the apparatus to successive pipe seams. The licensee Radiographers also provided inaccurate information with regard to securing the source (by locking). The daily survey record recorded that the source assembly was secured in the shielded position each time the source was returned to that position. The record had been completed prior to completing radiography activities that day. This matter is under separate review by the NRC.

c. The Assistant Radiographer did not survey the exposure device or guide tube. During each exposure observed it was apparent that the Assistant did an inadequate survey. He placed the survey meter along the side of the exposure device and then proceeded to remove the guide tube and film without completing a survey entirely around the exposure device or over the length of the guide tube. On the final exposure, as observed from the same side of the road where the Assistant was working, the survey meter was placed eight feet from the exposure device and the assistant proceeded to the collimator and guide tube without surveying further or locking the exposure device.

The exposure device was locked after the equipment was moved from the pipeline and the inspectors announced their presence.

Additional inaccurate information was provided by the Radiographer on the survey record for that day. The record indicated that a survey of the camera was made to insure the source had returned safely after each exposure. This matter is under separate review by NRC.

d. The inspector asked the Assistant what radiation reading he expected to observe when surveying the exposure device. After hesitating the Assistant stated that he expects to see the survey instrument peg on the X10 scale. The Radiographer corrected him by stating that he meant to say the X1 scale. The pegged reading would not have provided information to enable the Assistant to determine that the source was back in the safe shielded position. In a meeting with NRC on April 27, 1990 the Radiographer's Assistant again was asked by the Inspector how he would perform a survey of an exposure device. The individual indicated that he looked for a meter reading of zero. The Licensee's Operating and Emergency Procedures provided with their letter to NRC dated May 9, 1985, Section I, page 2, paragraph D states that "zero

radiation levels would indicate source did not return to the shielded position, or a very high reading as you approach the device would also indicate the source had not returned to the shielded position." The Radiographer Assistant's failure to understand how to perform a proper survey of a radiographic exposure device and his lack of knowledge of the Operating and Emergency procedure indicates a failure of the licensee to keep him informed of the precautions and procedures to minimize exposure to radiation.

e. No perimeter surveys were performed on any of the observed exposures. Condition 17 of License No. 29-21452-01 requires the licensee to operate in accordance with procedures contained in a letter dated May 9, 1985. Section I, page 1, paragraph C of the Operating and Emergency Procedures states that a survey of the restricted area will be done before radiography and "each time handling procedure varies which will change the previously established radiation output perimeter."

f. The caution radiation signs were ignored by non-radiation workers. Three individuals stood inside the area posted and the Assistant continued to operate the exposure equipment. Occupied vehicles were permitted to drive by the exposure equipment during exposures. The vehicles would be approximately twenty feet from the exposed source. The Assistant was approximately one hundred feet beyond the exposure device controls at this time.

g. The Assistant Radiographer turned his back on three occasions to the high radiation area, after cranking out the source, while walking back to the radiography truck approximately one hundred feet. Three non-radiation workers were within the posted radiation area at this time and the Radiographer was developing film in the darkroom.

h. The Radiographer and his Assistant did not establish the restricted area as required by the licensee's Operating and Emergency Procedures Section I, page 1, paragraph C and page 4, paragraph C and D. Two options are permitted at a field site: roping the area off to the two millirem per hour distance or utilizing charts provided in Section III of the same procedure to establish the restricted area boundary so that 2 millirem in one hour is not exceeded. The licensee personnel did not rope off the restricted area and they did not establish a restricted area boundary as indicated on the charts in that procedure. According to the procedure, 54 curies would require a restricted area be established out to approximately 380 feet in all directions for a 2 millirem per hour line. The licensee placed caution radiation signs at approximately 170 feet from the source in the directions perpendicular to those of the collimated beam of radiation. (See attached drawing). No restricted area was established in that nonradiation workers were permitted inside the posted area during exposure of the source and there were no boundaries established for the purposes of radiation protection in all other directions.

In addition to not establishing the restricted area the licensee's survey records for the exposures that day were inaccurate and did not reflect the attempt to establish any kind of restricted area at that time. The survey record indicates a two millirem value at 75 feet from the source. If the licensee's own tables are used from Section III of their Operating and Emergency procedures only one exposure would be permitted at 75 feet. If two exposures were performed the licensee would exceed two millirem in one hour in the unrestricted area. In fact the licensee performed three exposures at each weld location and there would have been a contribution from the exposures made at adjacent seams approximately 40 feet away. According to the licensee's procedures, the house approximately 100 feet away, as shown on the attached drawing, should have been part of the designated restricted area for at least one weld seam. The matter of the survey record being inaccurate is under separate review by the NRC.

Apparent violations of NRC Regulations associated with these observations are as follows:

The failure to adequately post the high radiation area and the failure to adequately post the radiation area are apparent violations of 10 CFR 20.203(b) and (c). (See paragraph a.)

The failure of the Assistant Radiographer to secure (by locking) the sealed source in the shielded position each time the source is returned to that position is an apparent violation of 10 CFR 34.22(a). (See paragraph b.)

The failure of the Assistant Radiographer to survey the entire circumference of the exposure device and the entire length of the source guide tube is an apparent violation of 10 CFR 34.43(b). (See paragraph c.)

The failure to survey the restricted area perimeter in accordance with the Operating and Emergency Procedures is an apparent violation of Condition 17 of License No. 29-21452-01. (See paragraph e.)

The failure of the Radiographer or his Assistant to maintain surveillance over the high radiation area is an apparent violation of 10 CFR 34.41. (See paragraph g.)

The failure of the Radiographer or his Assistant to establish the restricted area in accordance with the Operating and Emergency Procedures is an apparent violation of Condition 17 of License No. 29-21452-01. (See paragraph h.)

3. Instrument, Equipment, and Devices

The exposure device utilized was a SPEC Model 2T, serial number 295. The source was fifty four curies of iridium-192, serial number 15804. Two survey instruments were onsite both (G.E. Smith), Serial number 2847 and 486. Both instruments had labels which indicated they were in current calibration.

The Radiographer and his Assistant were wearing film badges and pocket dosimeters.

4. Exit Interview

The inspection findings were discussed with the licensee representatives identified in Section 2 of this report during a telephone call on April 25 and 26, 1990 and also during the management meeting with NRC on April 27, 1990.