## U.S. NUCLEAR REGULATORY COMMISSION REGION 1

Report No. 92-001

Docket No. 9999-0001

Licensee: Grinnell Corporation 1341 Elmwood Avenue Cranston, Rhode Island 02910

Facility Name: Grinnell Corporation

Inspection At: A Radiographic Fieldsite on Mill Road. Worcester, Massachusetts

Inspection Conducted: March 5 and 13, 1992

Inspector:

Amon 4 mile Duncan White, Health Physicist

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Approved by:

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Paul D. Swetland, Chief Industrial Applications Section

Inspection Summary: special unannounced safety inspection conducted on March 5 and 13, 1992 (Report No. 9999-0001/92-001)

Areas Inspected: Observation of Radiographic Operations, Maintenance of Equipment, Transportation, Part 19 Posting, Training, and Instrumentation, Equipment, and Devices.

Results: Nine apparent violations were identified: failure to adequately post the radiation area; failure to adequately rope off the restricted area; failure to post the high radiation area; failure to maintain direct surveillance over all entry points to the high radiation area; failure to survey the perimeter of the restricted area; failure to complete the daily equipment checklist; failure to include all required information on the shipping papers; failure to properly mark the shipping container; and failure to post information as required by 10 CFR 19.11.

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## DETAILS

#### 1. Persons Contacted

\*William Golini - Non-Destructive Examination Supervisor \*Thomas Jemo - Radiographer

\*indicates those present during exit interview via telephone

## 2. Background

Grinnell Corporation is licensed by the State of Rhode Island Department of Health (License No. 3D-064-01) for the use of Ir-192 and Co-60 to perform industrial radiography. This license expires on October 31, 1994. On March 2, 1992, Grinnell Corporation submitted a reciprocity request to NRC Region 1. Grinnell stated in their request that they would be conducting radiographic operations with a 70 curie Ir-192 source on March 5, 1992 for the R.H. White Construction Co. on Mill Road in Worcester, Massachusetts. Region 1 approved the request on March 2, 1992.

Approval of the reciprocity request permits Grinnell Corporation to conduct industrial radiography in a Non-Agreement State under a general license granted in accordance with 10 CFR 150.20(a). A general license granted in accordance with 10 CFR 150.20(a) subjects the general licensee, in part, to the provisions of 10 CFR 19, 20, 71 and subpart B of part 34.

## 2. Observations of Radiographic Operations

On March 5, 1992, radiographic operations were observed by the inspector at a temporary job site on Mill Road near the intersection of Mill Pond Road in Worcester, Massachusetts. The site was a R.H. White Construction Company pipe line job. At least 5 exposures were observed.

Radiography was observed from approximately 10:40 a.m. to 11:30 a.m. The radiography was being conducted on a pipe that ran along side a bridge over a local stream. The pipe was buried underground after it traversed the stream. The portion of the pipe radiographed included welds located at an elbow where the pipe entered the ground. During radiographic operations, the radiographer's truck was parked on the bridge in a closed lane closest to the pipe. Police were posted at both ends of the bridge to control the steady flow of traffic over the remaining open lane.

Upon the inspector's arrival at the site, the radiographer was concluding a set of exposures on welds at one end of the bridge. The inspector observed the sacond set of radiographic exposures done on the welds located closest to Mill Pond Road from two observation points. The first observation point was approximately 150 feet from the bridge in the apartment complex located between the stream, Mill Road and Mill Pond Road. The second observation point was located at the intersection of Mill Pond Road and Mill Road approximately 100 feet from the radiography site. One exposure was observed from the intersection which permitted an unobstructed view of the radiographic operations. Figure 1 provides a layout of the area in the vicinity of radiographic operations.

The inspector made the following observations:

a. The radiographer roped off the ends of the lane occupied by the truck and posted radiation area signs. There was an entrance to one of the apartments facing the bridge approximately 40 feet from the welds being radiographed. Radiation levels measured on the sidewalk located approximately 30 feet from radiographic operations were 30 milliroentgens per hour (mR/hr).

No radiation area or high radiation area signs were visible or posted in the direction of the apartment complex. The only barrier between the radiographic operations and a member of the public exiting the apartment or walking into the area from another section of the complex was a pile of dirt approximately 3 feet high along a ditch in which the pipe was installed and an erosion barrier. Although an individual could walk to within 10 feet of the radiography exposure, the inspector determined that this area was under the surveillance and control of the radiographer as evidenced by the radiographer's request to the inspector (who had not announced his presence) to leave the area prior to conducting an exposure.

Failure to adequately post the radiation area is an apparent violation of 10 CFR 20.203(b).

Failure to rope off the restricted area is an apparent violation of the licensee's procedures on page 6 of the their "Safety Practice for Gamma-Ray Inspection".

b. The inspector did not observe any posting of the high radiation area during radiographic operations. The high radiation area signs were located in the radiographer's truck during the radiographic exposures. No one entered the high radiation area during the inspector's observation of these activities. The high radiation area was posted by the radiographer after it was pointed out by the inspector. The radiographer's failure to evaluate the need to post the high radiation area precluded him from determining if all entries into the area would be under his direct observation. It was possible to gain access to the high radiation area from under the bridge; an area not under the direct surveillance of the radiographer.

The failure to post the high radiation area is an apparent violation of 10 CFR 20.203(c).

Failure to maintain direct surveillance of all entry points into the high radiation area is an apparent violation of 10 CFR 20.203(c)(4) and the licensee's procedures on page 7 of the their "Safety Practice for Gamma-Ray Inspection".

The inspector reviewed the radiation survey used to C. establish the boundaries of the restricted area. The radiographer had drawn a sketch of the immediate area which icluded the location of the roped off and posted radiation areas at each end of the bridge. There was a written note that the perimeter radiation survey for the restricted area was less than 2 mR/hr. The inspector established that this survey was performed prior to the first set of exposures at the other end of the bridge and a radiation survey of the area for the second set of exposures had not been performed. The licensee's procedures require that the boundaries of the restricted area be established, confirmed by radiation survey and the results recorded. The failure to perform a confirmatory survey for the seco, set of exposures precluded the evaluation of potentia radiation hazards. Such a survey could have identified 30 mR/hr radiation levels approximately 30 feet from the radiographic exposure.

Failure to conduct a confirmatory radiation survey of the perimeter to assess the potential radiation hazard for the second set of exposures, and to record the results is an apparent violation of the licensee's procedures on page 6 of their "Safety Practice for Gamma-Ray Inspection".

## 3. Maintenance of Devices

The inspector reviewed the licensee's daily utilization log (Grinnell Form RDI-12) and noted that the equipment check list was not filled out. On page 6 of Section VII in the licensee's Radiological Safety Practice for Gamma-Ray Inspection (I-SF-162), it states that "prior to equipment use, all equipment shall be inspected and the equipment check list on the reverse side of Form RDI-12 shall be completed." The radiographer stated that he inspected the equipment in the morning but forgot to fill out the checklist.

Failure to complete the equipment inspection checklist is an apparent violation of the licensee's procedures on page 6 of their "Safety Practice for Gamma-Ray Inspection".

#### 4. Transportation

The inspector reviewed the licensee's shipping papers and examined the shipping container used to transport licensed material and the location where licensed material is stored in the truck. The shipping papers used by the licensee are pre-printed with most information. The remaining information particular to the exposure device is entered each day by the radiographer. The radiographer had completed the shipping papers the day of the inspection and told the inspector that they are kept on a clipboard in the passenger cabin of the vehicle. The inspector noted that the shipping papers did not include the proper identification number (UN 2974) and did not state that the quantity of radioactive material was a reportable quantity (RQ).

The Amersham/Technical Operations Model 660 exposure device also serves as a Type B shipping container. During normal transport, the device is stored inside a cabinet in the laboratory portion of the truck. The inspector noted that the exposure device contained 68 curies of Ir-192. Shipping containers with more than 10 curies of Ir-192 are required to be labeled as a reportable quantity (RQ).

Failure to comply with appropriate Department of Transportation regulations is an apparent violation of 10 CFR 71.5(a). Specifically, (1) the failure to include the UN number and RQ on the shipping papers is an apparent violation of 49 CFR 172.203(c)(2); and (2) the failure to mark the shipping container with RQ is an apparent violation of 49 CFR 173.425(b)(8).

#### 5. Part 19 Posting

The inspector noted that the licensee posted a State of Rhode Island Notice of Employees form in the inside rear of the radiography truck. The licensee did not post a Form NRC-3 or the other notices specified in 10 CFR 19.11.

The failure to post Parts 19 and 20 and a Form NRC-3 is an apparent violation of 10 CFR 19.11.

#### 6. Training

On February 24 and 28, 1992, the radiographer received training from the livensee on the new and existing procedures associated with NRC and State rules and regulations. In a February 24, 1992 letter to Region 1, Grinnell Corporation stated with regard to the February 24, 1992 training session: "Items emphasized during the session included the need to follow all NkC rules and regulations." During the course of this inspection, the inspector noted a number of apparent violations of NRC regulations with regard to posting and surveys as well as apparent violations of the licensee's procedures for roping off restricted areas, surveying and maintenance.

As reflected by the findings of this inspection, the lack of compliance with a number of NRC regulations and licensee procedures one week after the above training was given raises serious concerns regarding the effectiveness of this training.

# Instrumentation, Equipment, and Devices

The exposure device utilized was an Amersham/Technical Operations Model 660, serial number 255. The source was 68 curies of Iridium-192, model number 429-9, serial number 5563. The survey instrument used at the site was labeled as calibrated on February 27, 1992. The inspector observed the radiographer properly survey the exposure device and guide tube as well as lock the exposure device after each exposure.

The radiographer was observed wearing a film badge, selfreading dosimeter and alarming rate meter during radiographic operations. The inspector verified that the self-reading dosimeter was properly charged.

No safety concerns were identified with the licensee's equipment.

## 8. Exit. Interview

The inspection findings were discussed with the licensee representatives identified in Section 2 of this report during a telephone call on March 13, 1992.

