

U. S. NUCLEAR REGULATORY COMMISSION
REGION V

Report No. 90-02

Docket No. 030-30870

License No. 53-23288-01

Licensee: Fewell Geotechnical Engineering, LTD
96-1416 Waihona Place
Pearl City, Hawaii 96782

Inspection at: Campbell Industrial Park, Hawaii

and

Fewell Geotechnical Engineering, LTD
96-1416 Waihona Place
Pearl City, Hawaii 96782

Inspector:

David D. Skov
David D. Skov, Sr. Radiation Specialist

11/15/90
Date Signed

Approved by:

Robert J. Pate
R. J. Pate, Chief, Nuclear Materials and
Fuel Fabrication Branch

11/15/90
Date Signed

Inspection Summary:

Special Inspection on October 23, 25-26, 1990 and November 1-2 and 8, 1990
(Report No. 030-30870/90-02)

Areas Inspected: This special, unannounced inspection was conducted to examine the use of licensed material during field radiographic operations. The inspection included a review of the following areas: internal audits; use of licensed material; surveillance of radiographic operations; radiological surveys; utilization logs; radiation survey instruments and calibration; personnel external exposure monitoring; posting and labeling; shipping and transportation; and independent measurements and observations.

Results: Nine apparent violations were identified during the inspection and are summarized as follows:

- A. A licensee radiographer failed to secure a 54 curie iridium-192 sealed source assembly (source) in the shielded position inside the radiographic exposure device (projector) after each source exposure and retraction on October 25, 1990 (Section 5).

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- B. A licensee radiographer failed to conduct radiation surveys of the projector and source guide tube after each source exposure on October 23 and 25, 1990 (Section 7).
- C. On October 23 and 25, 1990, the licensee failed to rope off any portion of the restricted area boundary, and failed to post "Caution-Radiation Area" signs for most of that boundary. In addition, "Caution-High Radiation Area" signs were not conspicuously posted. (Section 6).
- D. The licensee failed to conduct radiation surveys of the boundary of the restricted area prior to radiographic operations on October 25, 1990 (Section 7).
- E. On October 23, 1990, a licensee radiographer failed to prevent entry into the restricted area of individuals other than radiographers and radiographers' assistants (Section 9).
- F. A licensee radiographer failed to check (read the radiation exposure of) his pocket dosimeter after each source exposure on October 23 and 25, 1990 (Section 11).
- G. A projector containing a 54 curie iridium-192 source was not labeled with Department of Transportation (DOT) "Radioactive" category labels when the projector was transported in a vehicle (private carrier transport) to a temporary radiographic job site on October 25, 1990 (Section 13).
- H. The licensee failed to conduct audits of the radiation safety program at the required six month intervals (Section 14).
- I. A licensee radiographer was not audited within three months from his previous audit (Section 14). This is a repeat violation.

DETAILS

1. Persons Contacted:

Licensee:

R. Fewell, President
G. Martin, Radiation Safety Officer
T. Murray, Radiographer

Non-Licensee:

L. Miura, Special Agent, Department of Defense
K. Roughan, Radiation Safety Officer, Amersham Corporation
J. Graziadei, Amersham Corporation

2. Purpose of Inspection

This special, unannounced inspection was conducted to review the use of licensed material at a field radiography job site for compliance with NRC regulatory and license requirements. The inspection was prompted by the findings of an earlier NRC inspection on October 4, 1990 at the licensee's facility in Pearl City, Hawaii, which disclosed a lack of management control and oversight in certain areas of the radiation safety program.

3. Background and Introduction

Since at least September of 1990, Fewell Geotechnical Engineering (FGE) has routinely conducted licensed radiography at an oil pipeline construction project in Campbell Industrial Park (CIP), approximately 25 miles west of Honolulu, Hawaii. At the time of the inspection on October 23 and 25, 1990, the licensee was conducting radiography of pipe welds at the CIP job site inside an excavated trench about 35 feet north of a paved road (Malakole Street). The trench is approximately 15 feet wide and 5 feet deep. Malakole Street divides the CIP pipeline from the Chevron Refinery directly opposite and south of the job site. The job site is bounded on the north by a large coral landfill area which forms the top of a bluff that overlooks a long segment of the pipeline about 35 feet above and 65 to over 150 feet north of the job site. The entire area east and west along the pipeline and the landfill to the north is occupied at various times during the day by construction workers.

The inspector and an investigator from the NRC Office of Investigations initially observed one of the licensee's radiographers and other personnel at the radiography job site on October 23, 1990. At the time of the inspection starting at 2:45 PM, FGE's radiography operation was already in progress. From the position on the bluff, NRC personnel identified certain apparent violations of NRC requirements which are described in detail below. This initial inspection effort prompted a second field inspection of FGE radiography activities to confirm the initial NRC inspection findings. During the second surveillance and

inspection starting at approximately 2:00 PM on October 25, 1990, NRC personnel again observed the same radiographer employee using licensed material and working alone in the same general area as was observed previously. NRC personnel interviewed the radiographer on October 25-26, 1990 and under oath on November 1, 1990.

4. Summary of Licensed Program

FGE was issued a license on January 26, 1989, authorizing the possession of iridium-192 sealed sources not exceeding 100 curies per source for storage at the licensee's facility in Pearl City, Hawaii, and for use in industrial radiography at temporary job sites in Hawaii and elsewhere that are under NRC jurisdiction. The licensee is also authorized to use cesium-137 sources not exceeding 165 millicuries per source for calibration of survey instruments. The license authorizes the use of the iridium-192 sources in Gamma Industries Model Century and Amersham Model 660 and 683 exposure devices, and in certain source changers. However, all radiography to date has been conducted using the Amersham Model 660 exposure device (projector). The only persons authorized under the license to act as radiographers are Gary Martin and Thomas E. Murray. Martin is a full time FGE employee while Murray works as a radiographer only part-time for the licensee. The license does not authorize and FGE does not utilize radiographers' assistants.

5. Use of Licensed Material During Field Radiography

During radiographic operations on October 23 and 25, 1990 at the CIP job site, the inspector observed the radiographer's use of licensed material. 10 CFR 34.22(a) requires the source assembly (source) to be secured in the projector's shielded position each time the source is returned to that position. Section IV, paragraph 2.6 of the licensee's Operating and Emergency Procedures (OEP), incorporated by reference into License Condition 15, also requires radiography personnel to lock the exposure device following each source exposure.

FGE radiography was conducted using an Amersham Model 660 projector (S/N 3131) housing a 54 curie iridium-192 source, a 7 foot source guide tube with shielded collimator, and a 25 foot drive cable and associated reel type crank assembly. The licensee's radiographer was the only person seen operating the control assembly and thus exposing the source during NRC surveillance of FGE radiographic operations.

The Model 660 projector includes a safety feature that requires the operator to rotate the projector's selector ring to the "lock" position. This step prevents source movement in the projector provided the "lock" position is maintained. (The selector ring is incapable of being placed in the "lock" position unless the source is fully retracted within the device.)

On October 25, 1990, NRC personnel observed the FGE employee returning (cranked back) the source to the shielded position within the projector after completing each of five radiographic exposures. However, after retracting the source following the first, second, fourth, and fifth exposures, the radiographer walked directly past the projector to

retrieve the exposed film for processing without securing (locking) the source inside the projector. Only after the third source exposure (prior to moving the projector in preparation for radiographing a new weld on a different pipe a few feet away), did the radiographer lock the projector as required.

The failure to secure the source after every radiographic exposure potentially could have allowed the source to move to an unshielded position outside the projector.

The radiographer had a thorough understanding of the NRC required procedures for securing the source as evidenced by his demonstration and explanation to NRC inspectors during the inspections of October 4 and 25, 1990. He also stated during the inspections and again during the November 1, 1990 interview under oath that he understood and complied with 10 CFR Part 34 and license requirements regarding source securing. The licensee's failure to secure the source between radiographic source exposures is considered an apparent violation of 10 CFR 34.22(a) and License Condition 15.

One apparent violation and no deviations were identified.

6. Posting and Labeling

The inspector evaluated the licensee's program for compliance with posting and labeling requirements. Pursuant to 10 CFR 34.42, licensees are required to conspicuously post areas in which they are performing radiography with "Caution-Radiation Area" and "Caution-High Radiation Area" signs, in accordance with the requirements of 10 CFR 20.203(b) and (c)(1). FGE is also required, under its license (OEP Section IV, paragraph 2.2 of the January 13, 1989 application), to use rope temporary barriers and radiation area signs to establish the boundary of the restricted area prior to radiographic source exposures.

During FGE operations on October 23 and 25, 1990, NRC personnel observed the radiographer using radiation warning signs. On October 23, 1990, radiography was already in progress and radiation warning signs had previously been posted on traffic cones. The signs were posted a few feet from and along the north side of Malakole Street, which formed one side of the job site restricted area boundary. Additional warning signs were also posted further inside the restricted area a few feet from the trench. However, all of the signs faced toward and could be read only by persons entering the south boundary of the restricted area. No other signs were posted to warn personnel entering from other directions into the restricted area of the presence of radiation or high radiation areas. In addition, rope barriers were not established anywhere at the job site.

The same problems with posting and roped barriers were also observed during FGE radiography at the second CIP job site on October 25, 1990. The relative locations of the posted restricted area boundary and high radiation area warning signs were similar to those observed at the October 23, 1990 job site. "Caution-Radiation Area" signs were again posted only on traffic cones that formed the south restricted area boundary. The radiographer also failed to rope off any portion of the

restricted area boundary. Consequently, most of the restricted area that was accessible to non-radiographer personnel (including areas east and west along the trench and north of the job site) was neither roped nor posted as required.

When questioned by the inspector, the radiographer admitted that he was knowledgeable of the license requirement regarding use of rope boundaries. However, the radiographer indicated that he did not use rope because of the difficulty in establishing the rope boundary at this particular job site and because ropes were not needed to restrict unauthorized personnel access into such an open area in direct view of the radiographer. The radiographer added that additional radiation warning signs were unnecessary because he was always present in the area and could warn away any persons from entering the restricted area. However, as described in Section 9 of this report, the radiographer failed to prevent access of unauthorized personnel into the job site restricted area on October 23, 1990. The radiographer's failure to rope off any portion of the radiation boundary, and his failure to post signs for most of that boundary is considered an apparent violation.

One apparent violation and no deviations were identified.

7. Radiological Surveys

The inspector observed the radiographer's failure to conduct radiation surveys during radiography on October 23 and 25, 1990, as described below:

A. Restricted Area Boundary Surveys

10 CFR 20.201(b) requires that each licensee make such surveys as may be necessary to assure compliance with 10 CFR 20.105(b), which limits radiation levels in unrestricted areas. OEP Section IV, paragraph 2.5 of the January 26, 1989 application referenced by License Condition 15, also requires the licensee to establish the 2 mR/hr radiation (restricted area) boundary by posting and roping the boundary followed by radiation surveys during the initial source exposure to verify the proper location of the boundary at the start of radiographic operations.

Shortly after his arrival at the CIP job site on October 25, 1990, the licensee's radiographer placed traffic cones and posted radiation area signs only at the southern boundary of the restricted area as described earlier. However, the radiographer never conducted any radiation surveys during the radiographic operation to verify the correct placement of the posted southern restricted area boundary, nor did he conduct surveys of the remaining unposted 2 mR/hr radiation boundary.

In addition, the inspector measured radiation levels that were contrary to that permitted by the license on two sides of the restricted radiation area. For example, a radiation level of 3 mR/hr was measured at the inspector's position on the bluff overlooking the job site at an estimated distance of 150 feet from

the exposed source during the licensee's first source exposure. During a later reenactment of additional FGE source exposures, the inspector also measured a maximum radiation level of 6.5 mR/hr at the southern restricted area boundary. These measured radiation levels exceeded those permitted under the license at the restricted area boundary and demonstrated that the boundary had not been properly established.

When later questioned by the inspector, the radiographer acknowledged that he was aware of the license requirement regarding the 2 mR/hr radiation boundary but admitted that he had not made any radiation surveys of the restricted area boundary at the job site earlier that day. The radiographer claimed that since the public could not be exposed to a dose greater than 2 millirems in any one hour, radiation surveys were unnecessary to establish the 2 mR/hr boundary. However, the licensee's failure to conduct the required surveys is considered an apparent violation.

B. Exposure Device Surveys

10 CFR 34.43(b) requires radiation surveys of the entire circumference of a projector and source guide tube after each exposure to determine that the source has been returned to its shielded position inside the projector. OEP Section IV, paragraph 2.6 of the January 26, 1989 application referenced by License Condition 15, also requires radiation surveys of all sides of the exposure device and guide tube immediately following each source exposure.

On October 23, 1990, FGE radiography was already in progress in the trench at the time of the inspection, as described earlier. A survey meter, later identified as a Victoreen Model 492 (S/N 806), was observed on top of a tool chest at the rear of an open bed pickup truck near the southeast corner of the job site, about 35 feet from the projector. However, this survey meter was never used during the radiographic operations observed by NRC personnel. The inspector later determined that a second survey instrument (Victoreen Model 400, S/N C521) had been worn by the radiographer on his belt over the left hip during the observed radiography operation. (See Section 8). The radiographer retracted the source into its shielded position within the projector after completing each of several radiographs. Following each source retraction, the radiographer approached the projector to change film, but he neither looked down at the survey meter nor did he remove the meter from his belt to conduct a survey of the projector and source guide tube. The radiographer later stated that no other survey meter had been placed in the trench or used at the October 23, 1990 job site.

At the start of licensed radiography on October 25, 1990, NRC personnel observed the radiographer place his survey meter (Victoreen Model 492, S/N 806) on a board inside the trench approximately 40 feet from the projector. The other survey meter (Victoreen Model 400, S/N C521) that the radiographer claimed he normally wore on his belt, was left inside his vehicle at the job

site and was not utilized at any time during the operation. (The radiographer later stated that he did not use the instrument because he found that it was malfunctioning earlier that day). The radiographer made six separate radiographic exposures of pipe welds before terminating the operation when NRC personnel revealed their presence at the site. As on October 23, 1990, the radiographer again failed to pick up or use the Model 492 survey meter while approaching the projector on each of five separate occasions after retracting the exposed source. Only after "arrival" of NRC personnel at the site following the sixth source exposure did the radiographer survey the projector as he demonstrated how he normally conducted such surveys (see below). The licensee's failure to conduct the required radiation surveys of the projector and guide tube is considered an apparent violation.

The inspector subsequently asked the radiographer if he always conducted radiation surveys of the projector with a survey meter after each source exposure. The radiographer replied that he had and demonstrated to the inspector and investigator how he carried his survey meter and the procedure he used in conducting a radiation survey of the projector and guide tube. The radiographer also indicated that in addition to the belt-carried survey meter, he normally leaves the Victoreen Model 492 survey meter next to the projector to monitor radiation levels following source exposures. As a result, the radiographer appeared to demonstrate a thorough understanding of the NRC required surveys.

Two apparent violations and no deviations were identified.

B. Radiation Survey Instrumentation and Calibration

The inspector evaluated the licensee's program for compliance with the calibration and radiation survey instrument requirements of 10 CFR 34.24. The two radiation survey meters available to the radiographer for use at the CIP job site on October 23 and 25, 1990, were found to have an acceptable measurement range of 2 mR/hr through 1 R/hr. One of the survey meters (Victoreen Model 400, S/N C521) also alarms at full scale on each exposure range. However, this instrument was judged inoperable by the radiographer and was taken out of service prior to radiographic operations on October 25, 1990. (See Section 7.B.). The inspector's examination of this survey meter confirmed that the meter was malfunctioning. The radiographer replaced this instrument with another operating survey meter (Victoreen Model 492, S/N 806) for use at the October 25, 1990 FGE job site. The inspector's review of licensee records and interview of the radiographer indicated that both survey instruments had been calibrated within the previous three months as required.

No apparent violations or deviations were identified.

9. Surveillance of Radiographic Operations

The inspector observed the licensee's surveillance procedures during field radiography for compliance with license requirements. OEP Section I, paragraph 5.0, and Section IV, paragraph 2.5 of the January 13, 1989 application referenced by License Condition 15, provide that only radiographers and radiographers' assistants be permitted inside the 2 mR/hr radiation (restricted area) boundary, and that the licensee maintain surveillance to prevent unauthorized entry into the restricted area.

The inspector and investigator identified numerous problems with surveillance procedures implemented by the licensee's radiographer during source exposures at the October 23, 1990 job site. (NRC personnel knew when the source was exposed by observing the radiographer's use of the reel crank control unit and by the inspector's use of a survey meter to verify changes in radiation levels in response to movements of the source in the source guide tube between the projector and collimator.)

During several source exposures, six individuals were observed at various times and locations within the posted and unposted restricted area boundary. Two of these individuals (Individuals A and B), who were later identified by the radiographer as employees of Finlay Testing Laboratory, Inc., Pearl City, Hawaii, worked as helpers assisting the radiographer with radiographic film. Neither individual is a radiographer or assistant radiographer under any NRC license. The helpers were observed carrying the film to and from the trench where the film was taken from or handed to the radiographer between source exposures. However, both helpers were inside the restricted area during source exposures. Individual A was usually standing near a vehicle that was parked 40 to 50 feet southeast of the exposed source. Individual B was sometimes standing near the radiographer in the trench 30 to 50 feet from the exposed source, while at other times this helper stood in the area between the trench and the south restricted area boundary opposite Malakole Street.

Also noted was the entry of four other non-radiography personnel into the restricted area during FGE radiography. On one occasion, Individual C was observed entering the unmarked and unposted restricted area boundary from the west direction on the unpaved access road north of and parallel to the pipeline trench. Individual C walked past both the radiographer and the exposed source and then left the job site area as he continued walking along the north side of the trench. Individual C spent several seconds walking past the exposed source at an estimated distance of 25 feet from the source. At this position, Individual C may have been at least partly shielded from the exposed source by earth along one side of the trench.

On another occasion, Individual D walked directly north across Malakole Street from the direction of the Chevron Refinery toward the trench, entered the restricted area by walking past the posted radiation boundary, and finally walked behind the radiographer to the edge of the trench at an estimated distance of 50 feet from the exposed source. After briefly viewing the trench area, Individual D left the job site.

On yet another occasion, two forklift truck operators (Individuals E and F), in front and in direct view of the radiographer, were removing pallets from the ground above and approximately 5 feet from the southern edge of the trench within the posted restricted area. While Individuals E and F continued unloading the pallets, the radiographer cranked out the source, which remained exposed for at least one minute. Individuals E and F were about 25 feet from the exposed source.

The radiographer made no apparent effort to prevent entry of the above unauthorized personnel into the restricted area, or to warn personnel to immediately leave the area, or to retract the exposed source in order to reduce the radiation levels in the occupied areas. During the inspection of October 25, 1990, the inspector questioned the radiographer concerning the actions he would normally take should unauthorized personnel enter the job site restricted area. The radiographer replied that no personnel have ever walked into the area between the pipeline and the area north of the trench, and if they had they would have been prevented from entering the area.

The licensee's repeated failure to prevent entry into the restricted area of individuals other than radiographers and assistant radiographers is considered an apparent violation of License Condition 15. The results of the inspector's evaluation of the potential radiation exposures received by the six individuals who entered the restricted area are described in Section 10.

One apparent violation and no deviations were identified.

10. Independent Measurements and Observations

The inspector measured the gamma radiation levels that resulted from radiography operations at the CIP job site on October 23 and 25, 1990. All NRC surveys were conducted with an Eberline Model E-520 (S/N 2120) survey meter that was calibrated on 8/1/90. Radiation levels measured during source exposures indicated that the radiographer used a source collimator. Radiation exposures were therefore reduced significantly in most areas surrounding the exposed source. Source geometries similar to those in use during radiography at the October 25, 1990 job site were used by the inspector to help determine the maximum radiation exposures to persons entering the restricted area.

The inspector estimated the potential radiation exposures that Individuals A through F may have received while inside the restricted area. Accurate estimates of the radiation exposures were not possible because of significant uncertainties associated with occupancy times and distances from the exposed source, the directional orientation of the source and collimator relative to the pipe inside the trench during each source exposure, and the shielding and radiation scattering effects from the steel pipe, collimator, and soil. Nevertheless, using relatively conservative assumptions, the inspector calculated that all six individuals who were inside the restricted area described in Section 9 above received whole body radiation exposures of less than 2 millirems. These probable exposures are within the exposure limits permitted by 10 CFR 20.105(b)(1) for individuals occupying an unrestricted area.

No apparent violations or deviations were identified.

11. External Exposure Monitoring

The inspector evaluated the licensee's program for monitoring whole body exposures of radiography personnel. During licensee field radiography on October 25, 1990, the inspector observed the radiographer properly wearing a current film badge and two 0 to 200 milliroentgen (mR) range direct reading ion chamber pocket dosimeters (PDs). These PDs were recharged (zeroed) by the FGE radiographer prior to the start of radiographic operations, as required by 10 CFR 34.33(a).

According to the radiographer, one of the PDs he wore was utilized only for assessing the time needed for exposing radiographic film, and was not used for personnel monitoring purposes. Based on the inspector's review of licensee records, the second PD (Victoreen Model 541R, S/N C032916) worn by the employee had been checked for correct response to radiation prior to its use for personnel monitoring, in accordance with 10 CFR 34.33(c). The licensee also had records showing the radiation exposures received by the radiographer based on PD readings resulting from radiography conducted on October 23 and 25, 1990. Daily PD doses recorded were 13 and 3 mR, respectively. The licensee therefore appeared to be in compliance with 10 CFR 34.33(b), which requires that PDs be read and exposures recorded daily.

The licensee's procedure for using PDs, as described in License Condition 15-referenced DEP Section IV, paragraph 2.6, also requires the radiographer to check (read out) his PD immediately after surveying and locking the projector following each source exposure. However, as observed by NRC personnel during FGE radiographic operations on October 23 and 25, 1990, the radiographer repeatedly failed to check his PD after each of several source exposures. The radiographer told NRC personnel that he was aware of the FGE license requirement to check his PD between source exposures but admitted that he had failed to do so on October 25, 1990. The omission of these checks is considered an apparent violation of License Condition 15.

In addition to using two PDs during radiography on October 25, 1990, as described above, the radiographer also wore a Xetex Model 317B alarm ratemeter which provides an alarm signal at a preset dose rate of 500 mR/hr. The NRC does not require use of such alarm ratemeters until January 10, 1991. The alarm ratemeter appeared to be functional when demonstrated to NRC personnel; however, the inspector was unable to determine if the device had been calibrated for correct response to radiation.

One apparent violation and no deviations were identified.

12. Utilization Logs

The inspector examined the licensee's use of utilization logs for field operations to verify compliance with 10 CFR 34.27 and license requirements. Utilization logs were prepared by the radiographer corresponding to his use of licensed material at the FGE job site on

October 23 and 25, 1990. These and additional logs covering the use of the Model 660 projector for the period since October 4, 1990, properly identified the make and model number of exposure devices used, the date and location of use, and the name of the radiographer, as required.

The licensee had taken corrective action in response to the October 4, 1990 NRC inspection by modifying the utilization log form to include the following additional information: (1) model, serial number, and calibration due date of the survey meter used and (2) a schematic diagram showing locations and distances from the exposed source to the radiation warning signs and radiation levels measured.

No apparent violations or deviations were identified.

13. Shipping and Transportation of Radioactive Material

The inspector reviewed the licensee's shipment and transportation of the Model 660 projector source to the FGE job site on October 23 and 25, 1990, for compliance with NRC and Department of Transportation (DOT) requirements. The projector, contained inside a tool chest, was transported by the radiographer to the CIP job site on the open bed of a pickup truck (private carrier transport).

49 CFR 172.403(a) requires each package of radioactive material to be labeled with appropriate "Radioactive" category labels (White-I, Yellow-II, or Yellow-III) that identify the activity and radioactive contents. However, neither the projector nor the container enclosing the projector had been labeled with the required DOT "Radioactive" category labels. The absence of the required DOT labeling is considered an apparent violation of 49 CFR 172.403(a).

The licensee appeared to be in compliance with other NRC/DOT requirements regarding source blocking and bracing, packaging, placarding, monitoring, and use of shipping papers during private carrier transport of the projector source.

One apparent violation and no deviations were identified.

14. Internal Audit Program

The inspector examined the licensee's internal audit program for compliance with 10 CFR 34.11(d)(1) and License Condition 15, which requires observation of the performance of radiographers during actual radiographic operations at intervals not to exceed three months, and audits of the overall radiation safety program once every six months. "Safety Program" paragraph 2.2 in the January 13, 1989 application, referenced by License Condition 15, requires the licensee to conduct personnel and program audits and to document the results of these audits on an "Semi-Annual Audit" checklist form.

The inspector's review of licensee records and discussions with the RSO and the radiographer indicated that the RSO had most recently observed the radiographer's performance on July 20, 1990. The licensee's utilization logs and observations by the inspector and investigator

disclosed that the FGE employee had conducted radiography at various CIP job sites on October 21, 23, and 24-25, 1990, a period exceeding three months from the previous audit of July 20, 1990. The licensee's failure to audit the radiographer at three month intervals is considered an apparent violation of 10 CFR 34.11(d)(1) and License Condition 15. This same violation was identified for the period of February 10, 1990 to June 1, 1990 by another NRC inspector on October 4, 1990, and was discussed with the radiographer, RSO and FGE's President during the exit meeting the same day.

To audit the performance of FGE radiographers, the licensee uses a 12-point check list form that also serves to document the audit findings. Performance areas covered by the check list appears comprehensive with the exception of failing to provide for evaluating the radiographer's actions in locking the projector's source between source exposures. The RSO stated that his previous audits of the radiographer had always indicated full compliance with NRC requirements. The inspector's review of all previous records of RSO-conducted audits of the radiographer disclosed no deficiencies or violations identified by the RSO during licensed radiography. During the interview under oath, the radiographer also stated that he never violated any NRC or license requirements during those occasions when he was audited in the field by the RSO.

When questioned about the required six-month program audits, the RSO acknowledged that such audits had not been conducted since issuance of the original license (January 26, 1989) because he had overlooked the requirement, because he thought the licensee's safety program had been in compliance, and also because of his opinion that the license prevented him from auditing his own program. However, FGE apparently made no arrangements with other persons or organizations to audit FGE's program. The licensee's failure to conduct the required audits is considered an apparent violation of License Condition 15.

Two apparent violations (one repeat) and no deviations were identified.

15. Exit Conference

The inspector held an exit briefing with FGE's President, Mr. R. Fewell, at the conclusion of the site inspection on November 2, 1990. The inspector discussed the scope of inspection activities, including the NRC's surveillance, using videotape and photography, of the FGE radiographer conducting licensed radiography at the CIP job sites. The inspector then summarized the initial findings of the overall inspection and reviewed each apparent violation. The inspector also expressed his concern that the licensee had failed to adequately monitor its licensed activities to assure compliance with NRC regulatory requirements and license conditions.

In response, Mr. Fewell stated that previous audits by the RSO and reviews of the radiographer's past performance had indicated no problems with his conduct of radiographic activities under the license. However, Mr. Fewell agreed to remove the employee from licensed activities until November 5, 1990 pending subsequent NRC enforcement actions. (Immediately after the November 2, 1990 exit briefing, NRC Region V

notified Mr. Fewell of the NRC's decision to issue an immediately effective order prohibiting FGE's utilization of the employee in NRC licensed activities for three years).