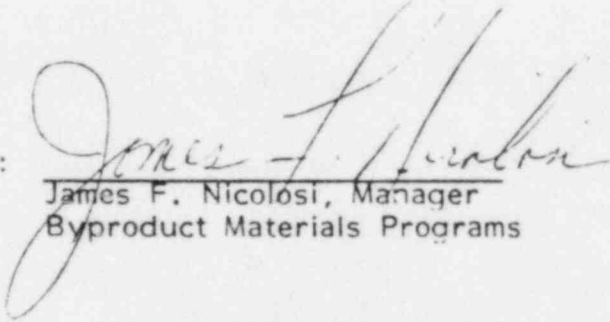



NORTH AMERICAN INSPECTION, INC.

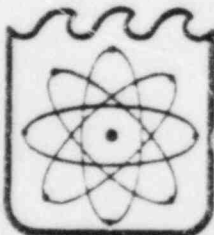
EVALUATION OF NRC INSPECTION
FINDINGS, NRC INSPECTION
REPORT NOS. 030-20982/8401
AND 030-20982/85-01
AND EA-85-01

Prepared by:


James F. Nicolosi, Manager
Byproduct Materials Programs

Reviewed by:


Dale E. Donaldson, Director
Radiological Services Division



HYDRO NUCLEAR SERVICES, INC.

a subsidiary of Westinghouse Electric Corporation

1009 W. NINTH AVE., KING OF PRUSSIA, PA 19406

(215) 337-0750

8512300589 851119
NMSS LIC30
37-23370-01 PDR



A Subsidiary of Westinghouse Electric Corporation

Radiological Services Division □ 1009 West Ninth Avenue □ King of Prussia, Pennsylvania 19476 □ (215) 337-0750

November 12, 1985

North American Inspection, Inc.
P.O. Box 88
Laurys Station, PA 18059

Attention: Robert K. Shumway, President

SUBJECT: EVALUATION OF NUCLEAR REGULATORY COMMISSION
INSPECTION FINDINGS, NRC INSPECTION REPORT
NOS. 030-20982/84-01 AND 030-20982/85-01 AND EA-85-01

Dear Mr. Shumway:

In response to your request, the Radiological Services Division (RSD) of Hydro Nuclear Services, Inc. (HNS), a wholly owned subsidiary of Westinghouse Electric Corporation, has reviewed the results of USNRC inspections conducted on October 18 and 19, 1984 and January 10 and 16, 1985 and subsequent reports dated November 8, 1984 (Report No. 030-20982/84-01) and February 12, 1985 (Report No. 030-20982/85-01) and the Notice of Violation and Proposed Imposition of Civil Penalty dated February 6, 1985 (EA-85-01) which were issued to North American Inspection Inc. (NAII).

This evaluation was performed by interviews of North American Inspection, Inc. personnel, record reviews of North American Inspection's program and the NRC inspection reports, Notice of Violation and Proposed Imposition of Civil Penalty and subsequent correspondence between NRC and North American Inspection, Inc. HNS also performed independent measurements and calculations based upon both North American Inspection, Inc. and Nuclear Regulatory Commission statements in various correspondence. For simplicity and clarity, each of the twelve (12) NRC findings and citations in the enclosed report has been organized in the following format:

- Statement of the citation
- Identification of the NRC requirement
- Excerpts from the appropriate inspection report(s)
- Identification of paragraph(s) from which excerpt(s) were taken

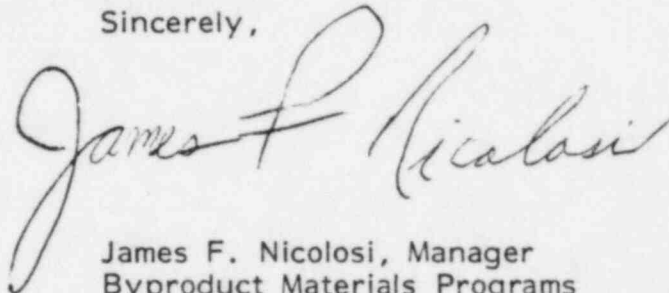
Mr. R. Shumway
Page 2

- Statement of NRC requirement
- Apparent violation of requirement
- HNS findings and discussion

At the conclusion of this report is a summary statement that includes observations made by HNS's professional evaluation team concerning NAI corrective actions and management program changes that have taken place since the first inspection. The final portion concludes with recommendations to NAI concerning the options they have concerning the escalated enforcement action.

Should you have questions concerning any portion of this report please call me at (215) 337-0750 or 9960.

Sincerely,



James F. Nicolosi, Manager
Byproduct Materials Programs

JFN/cen

Enclosure as Stated

PROPRIETARY INFORMATION

The information contained in this document is the proprietary information of Hydro Nuclear Services, a wholly owned subsidiary of Westinghouse Electric Corporation, and North American Inspection, Incorporated. In this regard, this document may only be used by, or with the expressed permission of, North American Inspection, Incorporated. No other use, disclosure, or copy, in whole or in part may be distributed or revealed to any individual or organization outside of North American Inspection, Incorporated without the prior permission of Hydro Nuclear Services or North American Inspection, Incorporated.

EXECUTIVE SUMMARY

As a result of the Notice of Violation and Proposed Imposition of Civil Penalty issued on February 6, 1985 by the Nuclear Regulatory Commission (NRC) and the NRC's decision in a letter dated August 7, 1985 that all violations occurred as stated and that no mitigation of the \$5,000 civil penalty was warranted, North American Inspection, Inc. (NAII) contacted the Radiological Services Division (RSD) of Hydro Nuclear Services (HNS), and requested HNS to conduct an independent evaluation of the NRC findings. The evaluation included interviews of NAII personnel, review of NAII's records, review of NRC correspondence (NRC Inspection Reports Nos. 030-20980/84-01, 030-20980/85-01, EA-85-01, 030-20980/85-02, and a letter dated August 7, 1985) and subsequent responses of NAII to the NRC. The above mentioned NRC reports and letters are included as Attachments 1, 2, 3, 4 and 5 respectively to this report.

The following is a summary of HNS's findings regarding each violation cited by NRC against NAII:

- Allowing unqualified individuals to act as radiographers

HNS does not agree with this NRC finding. Individual A, a fully qualified radiographer was present at the field site during the inspection. While it is true that Individual B and C had not

completed all of the training requirements, they were acting under the supervision of Individual A, who should have observed and supervised their activities at all times. The fact that he temporarily went into the portable darkroom appears more that NAII was in noncompliance with 10 CFR 34.44(c). The training issue should have been treated separately. HNS concludes that NAII did not violate 10 CFR 34.31(a).

- Did not maintain direct surveillance over a high radiation area.

HNS disagrees with this NRC finding. Interviews with Individual C indicate that the location of the Cobalt-60 was approximately 20 feet from the brick and mortar concrete wall when the inspector made his measurement on the other side of that wall. That wall is 15.5 inches using the Inverse Square Law for the distance from the source to the point of measurement and Half Value Layer determinations for the collimator and the concrete wall. The maximum radiation dose rate is calculated to be 0.04 millirems/hour. HNS concludes that NAII did not violate 10 CFR 34.41.

- Radiation levels in excess of 2 milliroentgens in any hour or 100 milliroentgens in any seven consecutive days in an uncontrolled area.

HNS does not agree with either portion of this citation. For the alleged violation on October 18, 1984, HNS evaluation indicates that

the maximum radiation dose rate behind the wall is 0.008 millirem in an hour. Therefore, NAII did not violate 10 CFR 20.105(b) at the Bethlehem Steel field site.

For the alleged violation on October 4, 1985 the NRC inspection report did not evaluate information on the Daily Radiation Survey Report that appeared contradictory in nature but that would have demonstrated that the radiation dose rate in the restaurant could not have been greater than two milliroentgens in an hour. Therefore, NAII was in compliance for radiation dose rates in this unrestricted area adjacent to its own facility.

- Did not have an audible/visible alarm system at permanent radiography installation.

HNS does not agree with this NRC finding. NRC inspectors did not examine NAII records carefully in this matter. They would have found that from the date of issue of the license to the date of the first inspection NAII had used the facility for a temporary field site on only 22 occasions. 10 CFR 20.203(c)(4) does not require an audible/visible alarm system in the case of a high radiation area established for a period of 30 days or less. Therefore, NAII did not violate 10 CFR 34.29(b).

- Did not comply with Department of Transportation requirements as specified in 10 CFR 71.5.

HNS agrees with these NRC findings.

- Did not adequately survey a radiographic exposure device at the conclusion of a radiographic exposure.

HNS does not totally agree with this NRC finding. License Condition 17 of NAII's license grants an exemption from the circumferential survey of an exposure device after the termination of an exposure. Therefore, NAII did not comply with the guide tube survey requirement only as stated in 10 CFR 34.43(b).

- Did not maintain utilization logs indicating the plant or site where the radiation exposure devices are use.

HNS does not agree with this NRC finding. A utilization log containing the required information exists for the date shown in the Notice of Violation and was created in a fashion consistent with License Condition 17 that satisfies the requirement 10 CFR 34.27. Therefore no violation of 10 CFR 34.27 occurred.

- Did not submit personnel termination reports for four (4) individuals to the NRC.

HNS does not fully agree with this NRC finding. NAII did not submit termination reports, as required, for two individuals within the specified time period. However, the report for the other two individuals were not due to NRC until November, 1984 and January, 1985. This was identified during the inspection October 18 and 19, 1984. The NRC inspectors apparently did not deem it important to adequately verify the dates of all four (4) terminations. The termination dates were not documented in NRC Inspection Report No. 030-20982/84-01.

- Did not have a qualified radiographer from another company complete a practical examination before being assigned to perform radiography.

HNS agrees with this NRC finding.

- Failure to secure a radiography source in a shielded position after each exposure.

HNS agrees with this NRC finding.

(1) CITATION: ALLOWING UNQUALIFIED PERSONNEL TO ACT
AS RADIOGRAPHERS

REQUIREMENT: 10 CFR 34:31(a)

EXCERPTS FROM NRC INSPECTION REPORT NO. 030-20982/84-01

Paragraphs 3 and 4

The inspectors observed the radiographic operations at a field site location on the property of Bethlehem Steel Co., Bethlehem, PA. In Bethlehem's Old World War II Building (Project #17), the licensee was performing radiographic operations using both cobalt and iridium sources at either end of the building. Individual B was setting up, cranking out and rewinding the iridium source, and surveying the exposure device. Individual A was in the mobile dark room developing film. Individual C was setting up, cranking out and rewinding the cobalt source, and surveying the exposure device. Individual D was assisting Individual C. During the course of the inspection, Individual A exchanged jobs with Individual B. Individual B developed film in the dark room and Individual A acted as the radiographer with the iridium source.

The inspector reviewed the licensee training program. Individual A has taken the radiographic examination to be a Level II radiographer. Individual B has taken the radiographic examination to be a Level I

radiographer (radiographer's assistant). Individual C has had 40 hours of radiation training, but has not passed the radiographer's assistance examination. Individual D has had 8 hours of training and is considered to be a helper or trainee. Both the Assistant RSO and Individual A consider Individuals B and C to be radiographer's assistants and Individual D to be a helper or trainee.

The finding that two individuals (Individuals B and C) were acting as radiographers prior to completing a demonstration of competence to use the radiography equipment and without demonstration of their understanding of the operating instructions by successfully completing a written test is an apparent violation of 10 CFR 34.31.a.

NRC APPARENT VIOLATION (EA-85-01: LETTER DATED 2-6-85)

10 CFR 34.31(a) requires that no individual act as a radiographer until that individual can demonstrate his understanding of the instructions which he has received regarding the subjects covered in Appendix A of Part 34 and has successfully completed a written test and a field examination on the subjects covered.

Contrary to the above on October 18, 1984, at a field site in Bethlehem, Pennsylvania, individuals were permitted to act as radiographers prior to demonstrating their understanding of the subjects outlined in Appendix A of Part 34, prior to passing a written test, and prior to

demonstrating their competence to use the licensee's radiographic exposure devices, survey instruments, and related handling tools.

HNS FINDINGS AND DISCUSSION

NRC Inspection Report No. 030-20982/84-01 states that Individual A had taken the radiographic examination to be a Level II radiographer and that Individual B had taken the radiographic examination to be a Level I radiographer (radiographer's assistant). Apparently, the NRC inspectors did not realize that Level I and Level II radiographic qualification examinations apply to the requirements of the American Society of Nondestructive Testing (x-ray film interpretation, film placement techniques, etc.) and are in no way related to the radiographer and radiographer's assistant examinations required by 10 CFR 34 and by License Condition 17 of NRC License No. 37-23370-01. The American Society of Nondestructive Testing (ASNT) requirements are additional Society requirements that do not come under the purview of NRC for non-reactor byproduct material applications. The NRC inspectors came to an incorrect conclusion about NAII personnel training qualifications in this area. HNS notes that NAII did not submit ASNT Level I and II examinations in the license application, therefore, the inspectors comments appear inappropriate.

NAII could not produce Individual B's written radiographer examination (as per 10 CFR 34) and the radiographic procedures examination re-

quired by License Condition 17 because the Radiation Safety Officer, (who wrote the NAI license application and listed himself as Radiation Safety Officer) had administered the examinations and misfiled them elsewhere other than in Individual B's personnel folder. Individual A, the husband of Individual B, knew that his wife had taken and passed the radiographer's examination, the radiographic procedures examination, and the ASNT Level I examination but because the tests could not be located during the inspection, Individual A could only admit that his wife was a radiographer's assistant as per the inspectors interpretation that a ASNT Level I examination was the same as an assistant radiographer's examination.

The inspection report (84-01) indicates that Individual B had taken the written examination to be a ASNT Level I radiographer (Level I) prior to the inspection. While this is true for the record reviewed, HNS's record review and interview indicated that the written tests taken by Individual B was for a radiographer, not a radiographer's assistant (see Attachment 6) as Individual B had previously been an assistant radiographer with Imperial Inspection Incorporated a company located in the State of Louisiana. This is supported by NRC Inspection Report No. 30-20982/85-02 (paragraph 3) in which the inspection findings contradict the inspection findings in NRC Inspection Report 30-20982/84-01. NRC Report No. 30-20982/85-02 is included as Attachment 4 to this report. The excerpt from paragraph 3 of that report is:

Individual B (actual name removed) had 40 hours of radiation safety

training provided by Imperial Inspection Incorporated, on June 12, 1983. Individual B passed the NAII Radiographer Examination on April 17, 1984 and received a 70% score; she passed the Radiographic Procedure Exam on April 19, 1984 and received 80% score; and she passed the practical performance examination on February 25, 1985 (end of excerpt).

The NRC's letter dated August 7, 1985 (Appendix; p. 2) to NAII also acknowledges this fact but did not change the citation in the Notice of Violation to reflect that fact that one individual had, indeed, taken the two written examinations required by 10 CFR 34.31 and License Condition 17.

HNS agrees that the practical examination for Individual B had not been documented. Interviews with the President of NAII indicated that the Radiation Safety Officer, originally named in the license application, had administered the practical examination but had not documented that fact in the file. Additionally, Individual A, a qualified radiographer and the husband of Individual B had instructed and observed his wife correctly complete the elements of the practical examination as listed in License Condition 17. License Condition 17 does not state who specifically may administer any of the examinations. It appears to imply that one who is qualified at that level may administer the examination. Individual A indicated that on a number of occasions he had observed his wife correctly perform the elements contained in the practical examination. It seems that for her the citation should be for not adequately

documenting the practical examination rather than for not allowing an "unqualified" individual to act as a radiographer. Individual C, while having completed 40 hours of training had not taken the written and practical examinations to be an assistant radiographer.

The Notice of Violation states that "individuals" (B and C) were allowed to act as radiographers prior to passing a written test and practical examination. The intent of 10 CFR 34.31(a) is to prohibit licensees from assigning untrained and unqualified individuals out on their own to perform radiography in the absence of a qualified individual. NAII had a qualified radiographer (Individual A) as per 10 CFR 34.31(a) at the field site on October 18, 1985. NRC Inspection Report 030-20982/84-01 notes that Individual A was inside the portable dark room during the inspectors observation. That truck was located 50 to 60 yards from each crank out point. While he could not visibly see Individual B and C, he could hear them if they had requested assistance, as there is no industrial manufacturing going on in that section or the adjacent partitioned area. Therefore, it would seem that NAII did not comply 10 CFR 34.44(c) (Supervision of radiographer's assistants), in that Individual A did not visibly observe Individuals B and C while radiography was being conducted. As for the training evaluation, in the case of Individual B, NAII did not comply with 10 CFR 34.31(c) by not administering a practical examination to Individual B.

In the case of Individual C, NAII did not comply with 10 CFR 34.31(b)(3) by not administering written and practical examinations

after training. Therefore, NAII did not violate 10 CFR 34.31(a) in the Notice of Violation in EA-8501 (Attachment 3).

Finally, NRC Inspection Report No. 030-20982/84-01 states in paragraph 3 that NAII was conducting radiography at both ends of the building. This is incorrect as NAII personnel occupied only one bay at the end of a four-bay building (also see HNS Finding and Discussion in next section).

(2) CITATION: DID NOT MAINTAIN DIRECT SURVEILLANCE
OVER A HIGH RADIATION AREA

REQUIREMENT: 10 CFR 34.41

EXCERPTS FROM NRC INSPECTION REPORT NO. 030-20982/84-01

Paragraph 3

The inspector surveyed the radiation levels in the building adjacent to the end of the building where the cobalt exposures were taking place. Radiation levels of 200 millirems per hour were measured approximately two feet from the wall while the cobalt source was in the exposed position. It was noted that the licensee did not survey this area in the adjacent building and that there was no continual surveillance by the individual performing radiography to protect against unauthorized entry into this high radiation area. In addition, there were no barriers erected around the iridium or cobalt exposure areas.

The finding that the radiographer failed to maintain direct surveillance to protect against unauthorized entry into the high radiation area in the building adjacent to the cobalt exposure area is an apparent violation of 10 CFR 34.41.

NRC APPARENT VIOLATION (EA-8501: LETTER DATED 2-6-85)

10 CFR 34.41 requires the radiographer or radiographer's assistant to maintain direct surveillance of the operation to protect against unauthorized entry into a high radiation area.

Contrary to the above, on October 18, 1984, at a field site in Bethlehem, Pennsylvania, a high radiation area existed in a building adjacent to the area where radiographic operations were being performed, and direct surveillance was not maintained to protect against unauthorized entry into the high radiation area.

HNS FINDINGS AND DISCUSSION

HNS does not agree with this NRC finding. Interviews with Individual C indicate that the Cobalt 60 exposure device was approximately 20 feet from the interior concrete wall (brick and mortar) which partitioned this area from the adjacent area where the NRC inspector made his measurement on the other side of that wall. That wall is 15.5 inches thick. The radiography source activity was 93 curies. The collimator used with the exposure device has an 11 half value layer exposure reduction factor. The distance between the collimated source (exposed in the downward condition) and the point of the NRC measurement is 23.25 feet. Using the gamma ray constant (Γ) for cobalt-60 and the attenuation factor for concrete listed on pages 48 and 58 respectively in

Working Safely In Gamma Radiography, an NRC publication, HNS calculates a maximum radiation exposure rate of 0.04 millirem per hour.

Additional interviews with Individual C indicated that the NRC inspector did not have NAII personnel or the other inspector verify the 200 millirems per hour reading. The 84-01 report also does not detail what type of instrumentation was used by the inspector to make the measurement or the calibration date of that instrumentation. Even if NAII had used an uncollimated Cobalt-60 source, the radiation dose rate two feet behind the concrete wall is calculated to be 79 millirem per hour. Therefore HNS cannot reproduce the "200 millirems per hour" value noted in the report. HNS notes that paragraph 10 of the NRC report documents the type of instrumentation (with the calibration date) used by the inspector, such that HNS could verify the inspector's findings.

Evaluation of NAII's Daily Radiation Survey Report, Utilization Log and Employee Daily Time Sheet for October 18, 1985 (see Attachment 7) indicated the Cobalt-60 source was exposed for one hour and 45 minutes (105 minutes) over a nine hour period for a total of 30 radiographs. The time sheet shows 10 hours but, one hour was for travel to and from the field site. This process allowed an average of 3.3 radiographs to be completed each hour. Therefore each radiograph required 3.5 minutes. This totals 11.5 minutes of radiation exposure per hour. This means that the radiation dose to the unrestricted area was 0.008 millirems in an hour. This does not qualify the adjacent area as a high radiation area as claimed in the NRC inspection report. Therefore NAII

did not violate 10 CFR 34.41. Finally, Individual C's pocket dosimeter reading for the nine hour period of operation indicated he had received 35 millirems. Since he was much closer to the Cobalt-60 source, this would tend to discount the 200 millirem measurement.

HNS notes in NRC Inspection Report No. 030-20982/85-02 (paragraph 5) the inspectors show independent measurements and calculations to demonstrate the NAII was in compliance with 10 CFR 20.105(b)(1) with regards to a radiation area as defined by 10 CFR 20.202(b)(2). NRC Inspection Report No. 030-20982/84-01 shows no calculations to demonstrate noncompliance such that NAII can adequately respond to the apparent violation.

There is also an inaccuracy in the statement of the conditions of the NRC finding. There was no "adjacent building" as all work areas and adjacent areas surveyed by the inspectors were in the same building (World War II Building Project #17) which has four (4) partitioned areas under one roof. As stated previously, this building measures 900 feet x 300 feet. NRC Inspection Report No. 030-20982/84-01 states the condition of this finding incorrectly in the two identified instances in paragraph 3.

An interview with Individual A also indicated that he made Bethlehem Steel Corporation employees working at the other end of the building (approximately 700 feet away) aware of NAII's presence and purpose. Individual A also stated that there was a chain link fence around the

entire building with only two entry points. One was at the other end of the building where Bethlehem Steel Corporation employees would periodically enter to work in the opposite partitioned end of that building which was separated from the NAII by three concrete walls. The other was at the entry point where NAII personnel were working. NRC Inspection Report 030-20982/84-01 does not detail these items.

In the NRC letter dated August 7, 1985, (see Attachment 5, Appendix; p. 3), the letter states that the information given to the NRC inspectors by the Bethlehem Steel Company personnel indicate that the Fire Marshall was required to enter this area periodically during his routine tours of the Bethlehem facility. Three things are important here:

1. This information never appears in any of the NRC inspection reports so that NAII could adequately respond to the apparent violation.
2. NAII's own internal investigation indicated that the Fire Marshall is only required to pass by the building (not enter it) during his rounds.
3. At one point individual A, before conducting radiography at the field site, had checked both sides of the building and found the Fire Marshall sleeping in his car because it was a remote part of

the plant. Individual A woke up the Fire Marshall and had him leave the area. Whatever conversations the NRC inspectors had with the Fire Marshall, it appears that it may have been in his best interest to lie to the NRC by claiming no knowledge of NAII's presence.

(3) CITATION: RADIATION LEVELS IN EXCESS OF 2 MILLIROENT-
GENS IN ANY HOUR

REQUIREMENT: 10 CFR 20.105(b)

EXCERPTS FROM NRC INSPECTION REPORT 030-20982/84-01

Paragraph 3 and 5

The inspectors surveyed the radiation levels in the building adjacent to the end of the building where the cobalt exposures were taking place. Radiation levels of 200 millirem per hour were measured approximately two feet from the wall while the cobalt source was in the exposed position. The finding that an exposure rate greater than 200 mr/hr existed in an unrestricted area is an apparent violation of 10 CFR 20.105(b).

The licensee's "Daily Radiation Survey Report," dated October 4, 1984, indicates that the licensee was radiographing weld plates using 100 curies of iridium-192 in this facility. The survey stated that there was "2 mr" at a boundary which existed at 200 feet from the source in all four directions. On the survey report, it was noted that signs were posted, that the radiographer had direct surveillance over the source, and that a tungsten collimator was used.

The finding that a radiation level in excess of 2 millirem in any one hour was present in an unrestricted area (restaurant) is an apparent violation of 10 CFR 20.105.

NRC APPARENT VIOLATION (EA-85-01; REPORT DATED 2-6-85)

10 CFR 20.105(b) required that radiation levels in unrestricted areas be limited so that an individual who was continuously present in the area could not receive a dose in excess of 2 millirems in any hour or 100 millirems in any seven consecutive days.

Contrary to the above,

1. On October 18, 1984, at a field site in Bethlehem, Pennsylvania, radiation levels of 200 millirems per hour existed in an unrestricted area of an adjacent building when radiography was being conducted using a cobalt-60 source. Access to this area was not controlled for the purpose of radiation protection.
2. On October 4, 1984, radiation levels in excess of the limits set forth in 10 CFR 20.105(b) existed in a restaurant which is located 44 feet from the licensee's facility in Laurys Station, Pennsylvania in which radiography took place.

HNS Findings and Discussion

HNS disagrees with the NRC finding in Violation C.1. in the Notice of Violation (EA-85-01) at the field site in Bethlehem, Pennsylvania for the reasons stated in the previous discussion on page 7 of this report. The inspection report has not clearly established through calculations and other information that 10 CFR 20.105(b) was violated. Additionally, the NRC's violation statement in C.1. quotes a radiation dose rate. It does not show that a dose of 2 millirems in any hour or 100 millirem in any seven consecutive days was violated. Therefore, it is technically incorrect.

HNS does not agree with the NRC finding regarding Item C.2. in the Notice of Violation in NRC EA-85-01 dated February 6, 1985. HNS reviewed the Daily Survey Report [Form RS-4-4 (Rev. 0)] for October 4, 1985 (see Attachment 8) and interviewed NAII personnel. HNS noted that an Iridium-192 source of 110 curies was used with a tungsten collimator (1.25" x 1.25") to make a five (5) minute exposure in the NAII building. The open end of the collimator faced the northern wall. The collimator affords an exposure reduction value of four (4) half value layers. The exposure was made in the northwest corner of the building. The source was placed about one foot above the surface of the floor and exposed downward through the collimator. This portion of the building is approximately five (5) feet beneath ground level because of the natural contour of the land with the north and west walls constructed of eight (8) inch thick cinder blocks.

There is a restaurant which has a back wall located 91 feet to the east from the point where the radiograph was made. The floor of the restaurant is located at least six (6) to seven (7) feet below the floor surface of the NAII building, again because of the contour of the land. The eastern wall of the NAII building is 44 feet from the western wall (back) of the restaurant. The area in between (44 feet) is filled with earth (see Attachment 9). NAII uses the northwest corner of this building when they set up a temporary field site to perform gamma radiography. The gamma ray constant (Γ) for Iridium-192 from the Radiological Health Handbook is 0.48 Roentgen/hour @ 1.0 meter/curie. Using 110 curies as the source strength and taking credit for the four (4) half value layers (HVL) of the tungsten collimator, the gamma ray constant is reduced to 3.3 Roentgen/hour @ 1.0 meter/curie. Using the Inverse Square Law and calculating for a five (5) minute exposure the following values were obtained:

<u>Distance</u>	<u>5 Minute Radiation Exposure</u>	<u>% Limit</u>
44 feet	1.52 milliroentgen	75.0%
91 feet	0.37 milliroentgen	18.5%

The NRC allowable limit is 2.0 millirems in any one hour in an unrestricted area. Using the gamma ray constant from an official NRC publication (Working Safely In Gamma Radiography) the exposure values would be even lower. Additionally, there are three (3) cinder block walls each eight (8) inches thick between the location of the gamma

radiography work in the NAI facility and the restaurant interior to the east. HNS feels it is a fair assumption to assign one (1) HVL value of concrete (1.75 inches) for each cinder block wall. The level of radiation at the restaurant interior is therefore reduced to 0.04 millirem which is only 2.0% of the allowable limit. Theoretically, even if the radiation exposure was made at the 44 feet distance from the restaurant, which it was not, there are still two eight (8) inch cinder block walls. Using 2 HVLs, this would further reduce the 1.52 milliroentgen value at this distance to 0.38 milliroentgen which is 19% of the allowable NRC limit for radiation levels in the unrestricted areas. HNS notes that the inspection report never mentions that the location of the radiographic exposure was 91 feet from the back wall of the restaurant. Individual A stated that the NRC inspectors never questioned him as to the conditions and location of this radiograph with respect to the restaurant.

HNS did note that the radiographer calculated the 2.0 milliroentgen line at two hundred feet from an unshielded Iridium-192 source using a chart of standard table values which incorporates the Inverse Square Law for known source activities of Iridium-192 at various distances. HNS could not reproduce these results. It appears that the radiographer was careless in calculating and recording the two milliroentgen line. In fact, NAI gave this individual a written reprimand and was suspended for three (3) days without pay for his negligence (see Attachment 8). However, the NRC Inspection Report No. 030-20982/84-01 shows no calculations to demonstrate noncompliance. Additionally,

HNS could not reproduce the "11 millirems during a two hour period" calculation which was given in the NRC press release (I-85-24) to the news media (see Attachment 10). HNS notes that the inspection report does not mention this "11 millirem" value. However, HNS could reproduce this NRC "11 millirems" calculation for the October 18, 1985 field site measurement at the Bethlehem Steel Corporation plant. Therefore it appears that the NRC press release is incorrect in stating that this was the radiation dose in the restaurant. HNS believes the apparent Violation C.2. did not occur and that radiation levels greater than 2.0 milliroentgen per hour never existed in the restaurant based upon the Inverse Square Law, Half Value Layer determinations and a 1979 radiation survey and profile submitted as Exhibit 3 to NRC on February 21, 1985 by NAII. HNS believes that, at most, NAII did not adequately maintain survey records, a violation of 10 CFR 20.401. Moreover, the radiographer's pocket dosimeter information as entered on Form RS-4-4 (Rev. O) dated October 4, 1984, read 0 (zero) milliroentgens both at the beginning and at the end of the exposure. The dosimeter had been checked for response to radiation as required by 10 CFR 34.33 (b). This device was more likely to register the higher radiation dose levels the NRC claims to have been in the restaurant as the radiographer was much closer to the source during the five minute exposure period than anyone who may have been in the restaurant. Finally, NAII keeps 2 film badge monitors from a NAVLAP certified service at the walls of their upper and lower offices at the facility, as additional indicators of radiation exposure inside the facility. These offices are on the side closest to the restaurant. This information was

not mentioned in NRC Inspector Report No. 030-20982/84-01. HNS calculations show between May 20, 1984 to August 19, 1985, the average radiation levels were between 0.5 - 0.6 milliroentgen per day. No mention of these last two facts is made in NRC Inspection Report 030-20982/ 84-01. HNS could not verify and relate the "70 millirems" stated in the NRC press release to a meaningful regulatory application. HNS notes that the NRC press release is the first NRC document in its inspection activities concerning NAII that demonstrates any "calculated" numbers even though they appear to be wrong.

On February 21, 1985, the President of NAII submitted a reply to the Notice of Violation and Proposed Imposition of Civil Penalty to the Director, Office of Inspection and Enforcement, U.S. Nuclear Regulatory Commission. In Exhibit 3 of that reply, a radiation survey and profile of the Laurys Station, Pennsylvania facility was performed using 100 curies of Iridium-192 on February 20, 1979. The survey indicated that the facility could be used, if necessary, as a temporary field site to conduct gamma radiography and demonstrated the results of a radiation survey using a collimator. The survey indicated no measurable radiation levels outside the facility toward the restaurant. The physical characteristics of the facility have not changed since that survey.

In NRC's August 7, 1985, letter (Appendix; p.3) to NAII, the letter extends its comments beyond the scope of the original citation in the Notice of Violation concerning radiation levels in unrestricted areas at

the south end of the NAII facility. That information was not included in the Inspection Report No. 030-20982/84-01 and Notice of Violation, such that NAII could adequately respond to the NRC.

(4) CITATION: DID NOT HAVE AN AUDIBLE ALARM SYSTEM AT
A PERMANENT RADIOGRAPHIC FACILITY

REQUIREMENT: 10 CFR 34. 29(b)

Excerpts From NRC Inspection Report No. 030-20982/84-01

Paragraph 7

The building which is intended for the performance of radiography and in which radiography is regularly performed is not equipped with either a visible or audible warning signal to warn of the presence of radiation.

The finding that neither a visible nor audible warning signal activated by radiation was installed in the permanent radiographic installation is an apparent violation of 10 CFR 34.29.(b)

NRC Apparent Violation (EA-85-01: LETTER DATED 2-6-85)

10 CFR 34.29(b) requires that each entrance used for personnel access to the high radiation area in a permanent radiographic installation have both visible and audible warning signals to warn of the presence of radiation. The visible signal is required to be actuated by radiation whenever the source is exposed and the audible signal is required to be actuated when an attempt is made to enter the installation while the source is exposed.

Contrary to the above, as of October 19, 1984, the permanent radiographic installation located in the Laurys Station, Pennsylvania, facility did not have the required warning signals installed.

HNS FINDINGS AND DISCUSSION

The NAII license application to NRC dated January 31, 1984 contains no reference to any permanent radiographic facility at the Laurys Station, Pennsylvania facility. The inspection report's statement in paragraph 7 that the building is intended for the performance of routine gamma radiography is not based on license application facts as no permanent radiographic facility is described in this document. The NRC's letter dated August 7, 1985 (Appendix; p.4), to NAII indicated that two different radiography firms have previously performed gamma radiography there since at least 1979. While that may be factual information, the past has no bearing on the present case as NAII represents a new licensee. Additionally, that fact is not documented in any of the inspection reports. HNS noted that NRC had not cited these past two licensees for violations of 10 CFR 34.29(b) although gamma radiographic operations were conducted in the Laurys Station facility. Finally, the NRC August 7, 1985 letter indicates that the Laurys Station facility contained a "shielded structure" for the conduct of radiography. HNS could find no indication of this in any NAII correspondence to NRC. HNS inspection of the facility indicated that a "shielded structure" is not present.

10 CFR 20.203 (c) (4) states that in the case of a high radiation area established for a period of 30 days or less, direct surveillance to prevent unauthorized entry may be substituted for the controls required by paragraph (c)(2) of that section.

During interviews with NAII personnel and record review it was noted that NAII had used this facility from April 5, 1984 to October 18 and 19, 1984, (the days of inspections) for a period of 22 nonconsecutive days to perform gamma radiography in the northwest corner of the building. The NRC report did not document that the 30 day period had been exceeded. Therefore, 10 CFR 34.29(b) does not apply and was therefore not violated.

(5) CITATION: DID NOT COMPLY WITH D.O.T. REQUIREMENTS
SPECIFIED IN 10 CFR 71.5

REQUIREMENTS: 10 CFR 71.5 (a)
Ref: 49 CFR 172.403(c)
49 CFR 172.504(a)
49 CFR 173.488(a)

EXCERPTS FROM NRC INSPECTION REPORT NO. 030-20982/84-01

Paragraphs 7 and 10

A licensee representative stated that only the cobalt exposure device was stored in this building. All of the locked iridium exposure devices are stored inside a pick-up truck with the door locked. The exposure devices are not placed inside a shielded vault when they are not in use.

The iridium exposure device was being stored inside the portable dark room on a pick up truck. A licensee representative stated this source was used the previous evening. The door to the dark room was locked. No signs or placards were observed on the truck or portable dark room.

The iridium source was inside a Tech/Ops Model 660 exposure device, which is a Type B container [USA/9033/B(U)]. The inspector, using

the licensee's survey meter, a Ludlum Model 6, calibrated on 7-25-84, measured the radiation levels at contact and 3 feet from the surface. Measurement at the surface was 60 mr/hr and at 3 feet was in the range of 1-2 mr/hr. Since this package exceeded 50 mr/hr at contact and 1 mr/hr at 3 feet, a DOT Radioactive Yellow III label was required on the exposure device (package). No DOT label was on the package. A licensee representative stated that he was unaware that such a label had to be affixed to the package.

The licensee representative stated that they only placard the vehicle when they transport the cobalt exposure device. He stated that he was not aware that, when the package required a DOT Radioactive Yellow III label, the vehicle had to be placarded. Since the iridium exposure device required a Radioactive Yellow III label, the vehicle also had to be placarded.

The exposure device was wedged in the dark room to prevent movement; however, it was not adequately secured to prevent shifting while in transit.

The finding that a DOT Radioactive Yellow III label was not affixed to the exposure device while in transit is an apparent violation of 10 CFR 71.5(a) with regard to 49 CFR 172.403(c).

The finding that the vehicle was not placarded while transporting a Radioactive Yellow III package is an apparent violation of 10 CFR

71.5(a) with regard to 49 CFR 172.504(a) and Table I footnotes of that section.

The finding that the radioactive exposure device was not secured in order to prevent shifting while in transit is an apparent violation of 10 CFR 71.5(a) with regard to 49 CFR 173.448(a).

NRC APPARENT VIOLATIONS (EA-85-01 LETTER DATED 2-6-85)

10 CFR 71.5(a) requires that licensed material being transported comply with the applicable requirements of the regulations appropriate to the mode of transport of the Department of Transportation in 49 CFR Parts 170-189.

1. 49 CFR 172.403(c) requires that packages containing radioactive material with radiation levels in excess of 50 millirem per hour at the package surface of 1 millirem per hour at three feet be affixed with a Radioactive Yellow III label.

Contrary to the above, on October 19, 1984, a radioactive exposure device exhibiting radiation levels of 60 millirem per hour at the surface and 1-2 millirem per hour at three feet was transported without a Radioactive Yellow III label affixed to the device.

2. 49 CFR 172.504(a) requires that a vehicle carrying packages bearing the Radioactive Yellow III label be placarded on each end and each side with "Radioactive" placards.

Contrary to the above, on October 19, 1984, a radioactive exposure device that should have been labeled with a Radioactive Yellow III label was transported in a vehicle which was not properly placarded.

3. 49 CFR 173.448(a) requires each shipment of radioactive material to be secured in order to prevent shifting during normal transportation conditions.

Contrary to the above, on October 18, 1984, a radioactive exposure device was transported without being secured to the vehicle in order to prevent shifting during normal transport.

HNS FINDINGS AND DISCUSSION

HNS agrees with these NRC findings. However, HNS does note that the inspection report does not document that the Source Storage Utilization Log required by License Condition 17 was evaluated to confirm the inspectors conversations with the license representative.

(6) CITATION: DID NOT ADEQUATELY SURVEY A RADIO-
GRAPH C EXPOSURE DEVICE AT THE CON-
CLUSION OF A RADIOGRAPHIC EXPOSURE

REQUIREMENT: 10 CFR 34.43(b)

EXCERPTS FROM NRC INSPECTION REPORT NO. 030-20982/84-01

Paragraph 3

The inspectors observed that both Individuals B and C did not survey up the guide tube after the exposure was completed. This observation was made on several different exposures for each of these two individuals. It was noted that Individual A did survey the guide tube when he completed an exposure.

The finding that individuals performing radiography did not survey the guide tube after each exposure is an apparent violation of 10 CFR 34.43(b).

NRC APPARENT VIOLATION (EA-85-01; LETTER DATED 2-6-85)

10 CFR 34.43(b) requires that a physical radiation survey be made after each radiographic exposure to determine that the sealed source has been returned to its shielded position. The entire circumference of the radiographic exposure device must be surveyed and, if the device

has a source guide tube, the survey must include the entire length of the guide tube.

Contrary to the above, on October 18, 1984, a radiographer's assistant did not perform a survey that was adequate to determine that the sealed source had returned to its shielded position in that the survey did not include the entire circumference of the exposure device and the entire length of the guide tube.

HNS FINDINGS AND DISCUSSION

After discussion with NAII personnel and review of the NAII license application, HNS disagrees in part with this NRC finding. License Condition 17 of NAII's license grants them an exemption from the circumferential survey requirement. Specifically, Section 4.9 (a) (2) (see Attachment 11) of NAII's license application states an alternate method of exposure device survey upon retraction of the radiography source back into the exposure device. The NRC license reviewer approved this alternate method. Therefore, NAII was only in noncompliance for not surveying the source guide tube after the completion of an exposure. NAII did survey at the "nipple outlet" at the completion of each exposure.

HNS notes that the 84-01 inspection report does not mention any violation of the circumferential survey which is stated in the "Contrary to" section of the citation in the Notice of Violation.

(7) CITATION: DID NOT MAINTAIN UTILIZATION LOGS INDICATING THE PLANT OR SITE WHERE THE RADIATION EXPOSURE DEVICES ARE USED

REQUIREMENT: 10 CFR 34.27

EXCERPTS FROM NRC INSPECTION REPORT NO. 030-20982/84-01

Paragraph 6

The inspectors reviewed the utilization log. This log contains information describing the exposure device, the radiographer assigned, plant site, and date out and date in with radiographer initials. It was noted that the cobalt-60 exposure device was not in storage and not entered on the log. A licensee representative stated the source was at a field site (Bethlehem Steel), but agreed that information was not indicated in the log. It was also noted that, if a source was assigned to a field site and was replaced, the utilization log did not indicate the disposal of the old source and the replacement of the new source.

The inspectors reviewed the quarterly inventories and found them to contain all of the required information. Each source was accounted for on the inventory.

The finding that the cobalt exposure device was at a field site and an

appropriate entry was not on the utilization log is an apparent violation of 10 CFR 34.27.

NRC APPARENT VIOLATION (EA-85-01: LETTER DATED 2-6-85)

10 CFR 34.27 requires that a utilization log be maintained indicating the plant or site where the radiation exposure devices are used.

Contrary to the above, on October 19, 1984, a cobalt-60 exposure device was used at a field site in Bethlehem, Pennsylvania, but such use was not indicated in the utilization log.

HNS FINDINGS AND DISCUSSION

HNS does not agree with this NRC finding. HNS reviewed the information contained in the "SOURCE STORAGE UTILIZATION LOG" (Form RS-4-2). It appears to meet the requirements of 10 CFR 34.27. HNS reviewed the "UTILIZATION LOG" (Form RS-4-6). It meets and exceeds the requirement of 10 CFR 34.27. Discussions with the President of NAI indicated that the "SOURCE STORAGE UTILIZATION LOG" was designed as an administrative internal control by the company to know what equipment was on hand to help plan for each day's work. The "UTILIZATION LOG" was designed to meet the requirement of 10 CFR 34.27 (see Attachment 12). The fact that NAI chose to include additional information on this form which exceeds the requirements of 10 CFR 34.27 is not prohibited by the requirement. HNS fails to under-

stand the insistence of the NRC inspector that a form clearly marked "SOURCE STORAGE UTILIZATION LOG" is the "official" utilization log when another form clearly marked "UTILIZATION LOG" contains both the required, plus additional information. Historically, NRC has never told licensees how to keep records; rather that records must contain the required information. During NRC Inspection No. 030-20982/85-01 (see Attachment 2; paragraph 8) at a field site, that NRC inspector accepted Form RS-4-6 (UTILIZATION LOG) as the official record and found it contained all the required information. Either the NRC is inconsistent and arbitrary in its approach to this record or one of the NRC inspectors was wrong in insisting that the "SOURCE STORAGE UTILIZATION LOG" form was the "official" record. However since the information for the Cobalt-60 source was contained on the "UTILIZATION LOG" at the field site, (see Attachment 12) no violation of 10 CFR 34.27 occurred. It should be noted that all sources were accounted for during the required quarterly inventory log checks. 10 CFR 34.27 does not require that the utilization log note the replacement/disposal of radiography sources as noted by the inspector.

The NRC letter dated August 7, 1985 (Appendix; p.6) does not acknowledge that FORM RS-4-6 (UTILIZATION LOG), which was submitted to NRC on February 21, 1985, exists and that it meets the requirements of 10 CFR 34.27.

(8) CITATION: DID NOT SUBMIT PERSONNEL TERMINATION
REPORTS FOR FOUR (4) INDIVIDUALS TO THE
NRC

REQUIREMENT: 10 CFR 20.408(b)

EXCERPTS FROM NRC INSPECTION REPORT NO. 030-209,2/84-01

Paragraph 8

A licensee representative stated that four radiographers had terminated employment. The licensee sent termination reports to the individuals, but did not include a copy to the NRC.

The finding that the licensee did not furnish a copy of individual radiation exposure reports to the NRC is an apparent violation of 10 CFR 20.408(b).

APPARENT NRC VIOLATION (EA-85-01: LETTER DATED 2-6-85)

10 CFR 20.408(b) requires that a report be sent to the NRC of an individual's exposure to radiation when he terminates employment.

Contrary to the above, since April 5, 1984, four individuals terminated employment, but as of October 19, 1984, termination reports were not provided to the NRC.

HNS FINDINGS AND DISCUSSION

HNS does not agree with NRC about the required number of termination reports due to the NRC. 10 CFR 20.408(b) also states that such reports shall be furnished within 30 days after the exposure of the individual has been determined by the licensee or 90 days after the date of termination of employment or work assignment, whichever is earlier. NAII uses a NAVLAP certified film badge service to evaluate personnel exposures. Generally, as an industry rule, once a client submits personnel film badges to the supplier for development, it usually involves a period of more than 30 days for processing and mailing time. Clients are only notified immediately by the film badge supplier if one of their personnel has exceeded a predetermined administrative or regulatory limit. NAII has always maintained personnel exposures below regulatory limits and therefore have received no immediate notifications concerning their personnel. By the time NAII receives its personnel exposure reports it is past the 30 day period. For the two NAII personnel who terminated employment on June 7, 1984 and June 12, 1984, their reports were due to the Office of Nuclear Regulatory Research by September, 1984. NAII did not submit the required report for these two individuals within the required 90 day period. However, for two individuals who terminated employment on 8/2/84 and 10/12/84, the reports to the Office of Nuclear Regulatory Research were not legally due until November 1, 1984 and January 11, 1985 (see Attachment 13). NRC Inspection No. 030/20982/84-01 was conducted on October 18 and 19, 1984. The NRC inspectors apparently

assumed that NAII would violate this requirement for these last two individuals. The NRC inspectors either misunderstand or do not know how to properly apply the requirements of this regulation. Therefore, only two termination reports were not filed within the required time period. HNS notes that the NRC inspection report did not contain the four dates of termination to demonstrate noncompliance.

(9) CITATION: DID NOT HAVE A QUALIFIED RADIOGRAPHER
FROM ANOTHER COMPANY COMPLETE A
PRACTICAL EXAMINATION BEFORE BEING
ASSIGNED TO PERFORM RADIOGRAPHY.

REQUIREMENT: LICENSE CONDITION 17

EXCERPTS FROM NRC INSPECTION REPORT 030-20982/85-01

Paragraph 2

The inspector reviewed the training records for selected radiographers who work out of the Laurys Station office. He noted that one radiographer had not completed practical performance examination prior to his performing as a radiographer on December 28, 1984 and thereafter.

The failure to require an individual to complete a practical performance examination before he was permitted to perform radiography constitutes an apparent violation of Condition 17 of License No. 37-23370-01.

NRC APPARENT VIOLATION (EA-85-01: LETTER DATED 2-6-85)

Condition 17 of License No. 37-23370-01 requires that licensed material be possessed and used in accordance with statements, representations, and procedures contained in the application dated January 31, 1984, and letters dated March 22, 1984, and May 4, 1984.

Item 5.3.3 on page 5.2 of the application dated January 31, 1984, requires that a person hired with radiographer credentials from another company complete a practical performance examination before being assigned to perform radiography.

Contrary to the above, as of January 11, 1985, a person hired with radiographer credentials from another company did not complete a practical performance examination before being assigned to perform radiography.

HNS FINDINGS AND DISCUSSION

HNS agrees with this NRC finding.

(10) CITATION: DID NOT SECURE A RADIOGRAPHY SOURCE IN
A SHIELDED POSITION AFTER EACH
EXPOSURE.

REQUIREMENT: 10 CFR 34.22(a)

EXCERPTS FROM NRC INSPECTION REPORT NO. 030-20980/85-01

Paragraph 8

The inspector observed the performance of several radiographic exposures. He noted the use of personal monitoring equipment, survey meters and collimation. He also observed that the radiographer and provided direct surveillance to protect against unauthorized entry into a high radiation area. During the exposures, the inspector observed the proper placement of caution signs and that the radiographer surveyed the radiation levels in unrestricted areas. The inspector noted that the radiographer failed to secure the source in the shielded position after each exposure.

This failure constitutes an apparent violation of 10 CFR 34.22(a).

NRC APPARENT VIOLATION: (EA-85-01: LETTER DATED 2-6-85)

10 CFR 34.22(a) requires that, during radiography operations, the sealed source assembly be secured in the shielded position each time the source is returned to that position.

Contrary to the above, on January 16, 1985, a radiographer performed a number of radiographic exposures and cranked the source from the end of the guide tube to the shielded position in the exposure device each time, but did not secure the source between each exposure.

HNS FINDINGS AND DISCUSSION

HNS reviewed NAIL's license application. License Condition 17 of NRC License No. 37-23370-01 requires that the exposure device be locked after each radiographic exposure, therefore HNS agrees with the NRC finding.

SUMMARY

Using the NRC enforcement criteria in 10 CFR 2, Appendix C and the former NRC inspection and enforcement experience of several members of the HNS evaluation team (see Attachment 14), HNS has come to the following conclusions. HNS concurs with the NRC findings in the following areas with the accompanying senerity levels:

- 1) 10 CFR 34.43(b) NAII did not do a survey of the source guide tube as reported, however License Condition 17 exempts NAII from doing a circumferential survey; Supplement VI; Section D.2. Severity Level IV.
- 2) 10 CFR 34.22(a) NAII did not lock the radiography device after each exposure. Supplement VI; Section D.2. Severity Level IV.
- 3) 10 CFR 71.5 NAII did not adequately secure the device during transportation;
NAII did not place DOT labels on the exposure device;
NAII did not placard the vehicle; Supplement V; Section D.2. Severity Level IV.

4) 10 CFR 20.408(b) NAII did not send termination reports for two, not four individuals as claimed by the NRC. Supplement IV: Section D.4, Severity Level IV.

5) License Condition 17 NAII did not have a qualified radiographer perform a practical examination upon employment; Supplement VI; Section E. Severity Level IV.

HNS does not concur with the NRC in the following areas:

1) 10 CFR 34.31(a) NRC misapplication of the regulation as discussed in the report.

2) 10 CFR 34.41 No high radiation area ever existed as discussed in the report.

3) 10 CFR 20.105(b)
Violation C.1.
Violation C.2. No radiation level greater than two millirems in any one hour existed in the unrestricted area as discussed in the report.

- 4) 10 CFR 34.29 No permanent radiographic installation exists at the Laurys Station facility as discussed in the report.
- 5) 10 CFR 34.27 A utilization log exists for October 19, 1984 as is discussed in the report.

In retrospect, NAII admits to having some management problems at the time of inspection in October, 1984, as pointed out by the NRC. HNS program evaluation of NAII licensed activities during October and November, 1985 indicates that NAII has made major changes since the initial NRC inspection. NAII has a duty to act in a fair and responsible manner under the license conditions as set for by NRC. HNS concurs with NRC that certain management problems existed at the time of inspection.

In the way of major program improvements, the President of NAII has severed relationships with the Radiation Safety Officer named in the original license application. This individual, who also wrote the application, had previously been president of another nondestructive testing company in the State of Ohio, where he also held an NRC license for similar activities until he sold the company. He, being the Radiation Safety Officer, was responsible for training of personnel and maintenance of related records. He "assured" the President that all training had been completed and documented as required by NRC. This individual also placed himself on the Board of Directors of NAII as stated in the

license application without making a financial investment of NAIL. At one point, this individual made a move to take over NAIL and become a major shareholder and therefore control NAIL. HNS suspects that this individual was not always "acting" in the best interest of NAIL. His letter dated April 30, 1985 to the NRC which is included as an attachment to NRC Inspection Report No. 030-20982/85-02 (see Attachment 4) is indicative of issue.

NAIL currently has a license amendment request to NRC to approve another individual as Radiation Safety Officer. This individual has gone through NAIL files and reorganized them for easy retrieval.

He has also called in staff members for retraining because in going over some of the tests given by the previous Radiation Safety Officer, mistakes were found in grading. These mistakes did not "unqualify" any individual as required by License Condition 17.

The President also released the Operations Manager from his duties after he had evaluated the General Manager's performance. The Operations Manager had also acted as Assistant Radiation Safety Officer. Finally, NAIL has sought an outside consulting group (HNS) to help evaluate and upgrade the program. NAIL has spent the amount of the civil penalty (\$5,000.00) in contracting services from HNS. It should be noted that this does not relieve the President of NAIL of his original responsibilities for the initial NRC findings.

As NAII has a duty to act in a responsible manner, so must NRC management. As the President of NAII had trusted his Radiation Safety Officer and Operations Manager, so has NRC management trusted field personnel in this instance to do their job as defined in their position description. NAII has to audit activities quarterly to evaluate their performance. NRC management review acts as a similar mechanism for their own field personnel. The HNS evaluation indicates the NRC reports are incomplete, inaccurate and lack documentation of evidence that is supposed to place NAII in noncompliance. This apparent lack is even all the more crucial since this case represents an escalated enforcement action. This was confirmed by the apparent errors in several areas of the press release issued by NRC. This is also confirmed by the introduction of information in the Notice of Violation and in NRC's August 7, 1985 letter which never appeared in the inspection reports or Notice of Violation such that NAII could adequately respond and the HNS finding that NRC inspectors never questioned Individual A about conditions concerning crucial matters for which NRC issued violations. Certain situations apparently were not properly evaluated by NRC but rather action was instigated on assumption. HNS recommends that this matter should be taken before an Administrative Law Judge for a fair resolution of the matter as regards NAII, since all other avenues have been exhausted. HNS concludes that NAII had several Severity Level IV violations, a situation usually handled by issuance of a Notice of Violation which requires a licensee's response and corrective actions if any are necessary. Unfortunately, this situation has progressed far more than it ever should have.

ATTACHMENT 1



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

08 NOV 1984

Docket No. 30-20982

License No. 37-23370-01

North American Inspection, Inc.
ATTN: Robert K. Shumway
President
P. O. Box 88
Laurys Station, Pennsylvania 18059

Gentlemen:

Subject: Inspection No. 30-20982/84-01

This refers to the routine safety inspection conducted by Mr. J. Davis and Mr. J. McFadden of this office on October 18 and 19, 1984 of activities authorized by NRC License No. 37-23370-01 and to the discussions of our findings held by Mr. Davis and Mr. McFadden with yourself and members of your staff at the conclusion of the inspection, and to a subsequent telephone discussion between yourself and Mr. J. Joyner on October 25, 1984.

Areas examined during this inspection are described in the NRC Region I Inspection Report which is enclosed with this letter. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations by the inspector.

As discussed during the telephone conversation between yourself and Mr. Joyner the apparent violations identified during this inspection will be discussed at an Enforcement Conference at our office in King of Prussia, Pennsylvania at 10:00 a.m., November 14, 1984. We understand that you will attend this meeting with members of your staff. You should be prepared to discuss the causes of these apparent violations and your proposed corrective action. Enforcement action for these violations will be considered following the Conference. The NRC Enforcement Policy is described in Appendix C of 10 CFR Part 2, a copy of which is enclosed for your information.

In accordance with 10 CFR 2.790(a), a copy of this letter and the enclosure will be placed in the NRC Public Document Room.

No reply to this letter is required. Your cooperation with us in this matter is appreciated.

Sincerely,

Thomas T. Martin, Director
Division of Engineering and
Technical Programs

Enclosure: NRC Region I Inspection Report No. 30-20982/84-01

8411149224

2 pp

North American Inspection, Inc.

2

cc w/encls:

Public Document Room (PDR)

Nuclear Safety Information Center (NSIC)

Commonwealth of Pennsylvania

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 84-01

Docket No. 030-20982

License No. 37-23370-01

Priority 1

Category C1

Licensee: North American Inspection, Inc.
P. O. Box 88
Laurys Station, Pennsylvania 18059

Facility Name: North American Inspection, Inc.

Inspection At: Licensee's Facilities at 3906 Main Street, Laurys Station,
Pennsylvania and a field location at the Bethlehem Steel Plant,
Bethlehem, Pennsylvania

Inspection Conducted: October 18-19, 1984

Inspectors: J. Davis, Radiation Specialist

11-8-84
date

J. McFadden, Radiation Specialist

11-8-84
date

Approved by: J. Kinneman, Chief, Nuclear Material
Section A

11-8-84
date

Inspection Summary: Routine, unannounced inspection of radiation safety pro-
gram on October 18 and 19, 1984

Areas Inspected: Management control systems, field site inspection, training and qualifications of personnel, licensee internal audits, operating and emergency procedures, use of materials, facilities and equipment, personnel monitoring control, leak tests, surveys, and transportation.

Results: Ten apparent violations were identified: Conduct of radiography without the personal supervision of a radiographer (paragraph 4); Conduct of radiography without direct surveillance of a high radiation area (paragraph 3); Excessive radiation levels in an unrestricted area (paragraph 3 and 7); Failure to have an alarm in the permanent radiographic installation (paragraph 7); Failure to survey the guide tube after completing the radiographic exposure (paragraph 3); Failure to maintain current utilization logs (paragraph 6); Failure to affix a D.O.T. Radioactive Yellow III label to exposure devices during transit (paragraph 10); Failure to placard a vehicle containing a Yellow III package (paragraph 10); Failure to secure exposure devices while in transit (paragraph 10); Failure to provide the NRC with a copy of termination reports (paragraph 8).

841114 0233

3pp

DETAILS

1. Persons Contacted

Principal Licensee Employees

- *R. K. Shumway, President
- *J. Guthrie, Operations Manager
- *G. Weaver, Assistant Radiation Safety Officer
- Individual A
- Individual B
- Individual C
- Individual D

*Denotes those present at the exit interview.

2. Organization Facility and Equipment

~~Mr. R. Shumway is the President and Radiation Safety Officer for the licensee. Mr. J. Guthrie, the Operations Manager, is also an Assistant Radiation Safety Officer and reports directly to Mr. Shumway. Mr. G. Weaver is another Assistant Radiation Safety Officer and also reports to Mr. Shumway. The radiographers report directly to Mr. Guthrie.~~

~~At the time of the inspection, the licensee possessed five iridium-192 sources ranging in activity from 20 to 100 curies in a Technical Operation Model 660 and Gamma Industries Model Gamma Century S exposure devices. In addition, they had one cobalt-60 source of 90 curies in a Gamma Industries Model Gammatron 100A exposure device.~~

~~At the present time, they employ five crews of one or more radiographers. The licensee representative stated that there were eight radiographers, one radiographer's assistant and one trainee. Two iridium exposure devices are normally stored inside of their portable dark room at the licensee's facilities at 3906 Main Street, Laurys Station, Pennsylvania. The cobalt exposure device is stored inside the licensee facilities at the same address. The three remaining exposure devices are stored inside the portable dark rooms on their job sites at Greenwood, New York, at Curry, Pennsylvania, and at Glenrock, Pennsylvania.~~

No violations were identified.

3. Field Site Inspection

~~The inspectors observed the radiographic operations at a field site location on the property of Bethlehem Steel Co., Bethlehem, PA. In Bethlehem's Old World War II Building (Project #17), the licensee was performing radiographic operations using both cobalt and iridium sources at either end of the building. Individual B was setting up, cranking out and rewinding the iridium source, and surveying the exposure device. Individual A was in the mobile dark room developing film. Individual C was~~

setting up, cranking out and rewinding the cobalt source, and surveying the exposure device. Individual D was assisting Individual C. During the course of the inspection, Individual A exchanged jobs with Individual B. Individual B developed film in the dark room and Individual A acted as the radiographer with the iridium source.

The inspectors observed that all 4 individuals had Landauer film badges and self-reading pocket dosimeters (0 to 200 mr) affixed to the belt loops of the pants. The dosimeter readings were in the range of 0-20 mr for all the individuals. They all stated that they rezero the dosimeters at the start of each shift. There were two Ludlum survey meters Model 6 available. The meter used with the iridium source was calibrated on August 15, 1984 by the manufacturer; the meter used with the cobalt source was calibrated on July 25, 1984 by the manufacturer.

what kind of survey was made?

The inspectors observed that both Individuals B and C did not survey up the guide tube after the exposure was completed. This observation was made on several different exposures for each of these two individuals. It was noted that Individual A did survey the guide tube when he completed an exposure.

The inspectors surveyed the radiation levels in the building adjacent to the end of the building where the cobalt exposures were taking place. Radiation levels of 200 millirem per hour were measured approximately two feet from the wall while the cobalt source was in the exposed position. It was noted that the licensee did not survey this area in the adjacent building and that there was not continual surveillance by the individuals performing radiography to protect against unauthorized entry into this high radiation area. In addition, there were no barriers erected around the iridium or cobalt exposure areas.

The finding that individuals performing radiography did not survey the guide tube after each exposure is an apparent violation of 10 CFR 34.43(b).

The finding that the radiographer failed to maintain direct surveillance to protect against unauthorized entry into the high radiation area in the building adjacent to the cobalt exposure area is an apparent violation of 10 CFR 34.41.

The finding that an exposure rate greater than 200 mr/hr existed in an unrestricted area is an apparent violation of 10 CFR 20.105(b).

4. Training and Qualification of Personnel

The inspector reviewed the licensee training program. Individual A has taken the radiographic examination to be a Level II radiographer. Individual B has taken the radiographic examination to be a Level I radiographer (radiographer's assistant). Individual C has had 40 hours

of radiation training, but has not passed the radiographer's assistant examination. Individual D has had 8 hours of training and is considered to be a helper or trainee. Both the Assistant RSO and Individual A consider Individuals B and C to be radiographers's assistants and Individual D to be a helper or trainee.

The finding that two individuals (Individuals B and C) were acting as radiographers prior to completing a demonstration of competence to use the radiography equipment and without demonstration of their understanding of the operating instructions by successfully completing a written test is an apparent violation of 10 CFR 34.31.a.

5. Licensee Internal Audits

The licensee representative stated that they have not conducted unannounced field inspections of the four individuals who were performing radiography at the Bethlehem Plant field site. Section 6.0 "Internal Management Review Procedures and Controls," attached to their application requires quarterly audits by the RSO such that each radiographer and assistant is inspected at least annually. However, since the license has only been in effect for the last six months, the licensee still has six months to audit each radiographer and radiographer's assistant who were involved in performing radiography at the Bethlehem Steel Plant.

No violation of NRC rules, regulations or license conditions were identified.

6. Operating and Emergency Procedures

Individual A, B, C and D each had a copy of the Operating and Emergency (O&E) Procedures, Parts 19, 20 and 34 at the field site. In the training file each individual had signed a certification that he has the O&E and understands the manual.

The inspectors reviewed the utilization log. This log contains information describing the exposure device, the radiographer assigned, plant site, and date out and date in with radiographer initials. It was noted that the cobalt-60 exposure device was not in storage and not entered on the log. A licensee representative stated the source was at a field site (Bethlehem Steel), but agreed that information was not indicated in the log. It was also noted that, if a source was assigned to a field site and was replaced, the utilization log did not indicate the disposal of the old source and the replacement of the new source.

The inspectors reviewed the quarterly inventories and found them to contain all of the required information. Each source was accounted for on the inventory.

The finding that the cobalt exposure device was at a field site and an appropriate entry was not on the utilization log is an apparent violation of 10 CFR 34.27.

7. Use of Materials, Facilities and Equipment

The licensee's facility where test plates, vessels, etc., are radiographed is a cement block building with three overhead doors. One third of the building is divided from the remainder by a cement block wall with an open passway in the middle of the cement block. The north area of the building is partially below grade. This building is approximately 44 feet from a restaurant to the east and 100 feet from a residential area to the north.

The licensee's "Daily Radiation Survey Report," dated October 4, 1984, indicates that the licensee was radiographing weld plates using 100 curies of iridium-192 in this facility. The survey stated that there was "2 mr" at a boundary which existed at 200 feet from the source in all four directions. On the survey report, it was noted that signs were posted, that the radiographer had direct surveillance over the source, and that a tungsten collimator was used.

Actual measurement or calculation?

The finding that a radiation level in excess of 2 millirem in any one hour was present in an unrestricted area (restaurant) is an apparent violation of 10 CFR 20.105.

A licensee representative stated that only the cobalt exposure device was stored in this building. All of the locked iridium exposure devices are stored inside a pick-up truck with the door locked. The exposure devices are not placed inside a shielded vault when they are not in use.

frequently

The building which is intended for the performance of radiography and in which radiography is regularly performed is not equipped with either a visible or audible warning signal to warn of the presence of radiation.

The finding that neither a visible nor audible warning signal activated by radiation was installed in the permanent radiographic installation is an apparent violation of 10 CFR 34.29.(b)

The inspectors reviewed the calibration records for the survey meters. It was noted that each meter had a 2-1000 millirem per hour range and they were calibrated at 90 day intervals. Meters observed in the field and in one of the dark rooms were operable.

8. Personnel Monitoring Control

The inspectors observed that all four individuals performing radiography in the field were wearing a film badge and self-reading pocket dosimeter with a range of 0-200 mR. Review of the records indicated that each individual entered their daily exposures from the pocket dosimeters.

The inspectors reviewed the exposure records of all individuals working for the licensee since April 1984. The licensee is using Landauer film badges processed monthly. The highest exposure was 530 millirem per month and less than 1000 millirem for the quarter. One individual was

noted to be 18 years old. Review of records indicated that he did not receive occupational exposure prior to his 18th birthday and that his year-to-date exposure is 240 millirem. All exposures were within the limits specified in 10 CFR 20.101.

The license was issued on April 5, 1984; therefore, no annual report to the NRC has been required.

A licensee representative stated that four radiographers had terminated employment. The licensee sent termination reports to the individuals, but did not include a copy to the NRC.

The finding that the licensee did not furnish a copy of individual radiation exposure reports to the NRC is an apparent violation of 10 CFR 20.408(b).

9. Leak Test

All leak tests are being performed using the Gamma Industries KOWIPE leak test kit. The cobalt and iridium sources have been leak tested within the 6 month interval as required by the license condition. All sources had less than 0.005 microcuries of removable contamination.

No violations of NRC rules, regulations or license conditions were identified.

10. Transportation

The iridium exposure device was being stored inside the portable dark room on a pick up truck. A licensee representative stated this source was used the previous evening. The door to the dark room was locked. No signs or placards were observed on the truck or portable dark room.

The iridium source was inside a Tech/Ops Model 660 exposure device, which is a Type B container (USA/9033/B(U)). The inspector, using the licensee's survey meter, a Ludlum Model 6, calibrated on 7-25-84, measured the radiation levels at contact and 3 feet from the surface. Measurement at the surface was 60 mr/hr and at 3 feet was in the range of 1-2 mr/hr. Since this package exceeded 50 mr/hr at contact and 1 mr/hr at 3 feet, a DOT Radioactive Yellow III label was required on the exposure device (package). No DOT label was on the package. A licensee representative stated that he was unaware that such a label had to be affixed to the package.

The licensee representative stated that they only placard the vehicle when they transport the cobalt exposure device. He stated that he was not aware that, when the package required a DOT Radioactive Yellow III label, the vehicle had to be placarded. Since the iridium exposure device required a Radioactive Yellow III label, the vehicle also had to be placarded.

The exposure device was wedged in the dark room to prevent movement; however, it was not adequately secured to prevent shifting while in transit.

The finding that a DOT Radioactive Yellow III label was not affixed to the exposure device while in transit is an apparent violation of 10 CFR 71.5(a) with regard to 49 CFR 172.403(c).

The finding that the vehicle was not placarded while transporting a Radioactive Yellow III package is an apparent violation of 10 CFR 71.5(a) with regard to 49 CFR 172.504(a) and Table I footnotes of that section.

The finding that the radioactive exposure device was not secured in order to prevent shifting while in transit is an apparent violation of 10 CFR 71.5(a) with regard to 49 CFR 173.448(a).

11. Exit Interview

The inspectors met with the licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on October 19, 1984. The inspectors summarized the purpose and scope of the inspection and findings. At no time during the course of this inspection was any written material provided to the licensee by the inspectors.

ATTACHMENT 2



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406
FEB 12 1985

Docket No. 30-20982

License No. 37-23370-01

North American Inspection, Inc.
ATTN: Robert K. Shumway
President
P.O. Box 88
Laurys Station, Pennsylvania 18059

Gentlemen:

Subject: Inspection No. 30-20982/85-01

This refers to the routine safety inspection conducted by Mr. F. Costello and of this office on January 10, 1985, at your facility in Laurys Station, Pennsylvania and by Mr. J. McFadden of this office on January 16, 1985, at a field site in Lebanon, New Jersey, of activities authorized by NRC License No. 37-23370-01 and to the discussions of our findings held by Mr. Costello with yourself and Mr. J. Guthrie of your staff at the conclusion of the inspection.

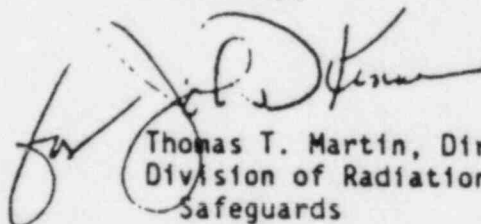
Areas examined during this inspection are described in the NRC Region I Inspection Report which is enclosed with this letter. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations by the inspector.

Enforcement action will be provided in separate correspondence.

In accordance with 10 CFR 2.790(a), a copy of this letter and the enclosure will be placed in the NRC Public Document Room.

No reply to this letter is required. Your cooperation with us in this matter is appreciated.

Sincerely,



Thomas T. Martin, Director
Division of Radiation Safety and
Safeguards

Enclosure: NRC Region I Inspection Report No. 30-20982/85-01

cc w/encl:
Public Document Room (PDR)
Nuclear Safety Information Center (NSIC)
Commonwealth of Pennsylvania

8542194082

bpi

DETAILS

1. Persons Contacted

*R. K. Shumway, President
*J. Guthrie, Operations Manager
J. Maslowski, Radiographer
S. Simpson, Radiographer
B. Shumway, Radiographer Assistant

Denotes those present at the exit interview.

2. Training

The inspector reviewed the training records for radiography personnel who were employed at a job site in Monroeville, Pennsylvania, where the licensee performed radiography from December 7 to December 20, 1984. The inspector noted that written tests and records of practical examinations were available for all but two of the eight individuals who had been hired for that job. The licensee president contacted these individuals' supervisor in the Pittsburgh area and stated to the inspector that this supervisor had assured him that tests for these individuals were available in the supervisor's office. The licensee president stated that copies of the Pittsburgh training records would be sent to the main office in Laurys Station for inclusion in the training file.

The inspector asked the licensee representatives how they complied with Section 5.3 of the supplement to their application which requires that previously trained radiographers submit verification of their experience and submit evidence of the completion of a recognized formal training program. Licensee representatives stated that, in some cases they had personal knowledge of this experience and training and, in other cases, they relied on the word of the individuals and on the observation of their work practices. The inspector determined that, of the eight individuals working at the Monroeville job site, licensee representatives had personal knowledge of the experience and training of three individuals. For the other individuals, the licensee representatives stated that each was interviewed to determine the extent of the individual's training and experience. The inspector was shown the notes made by licensee representatives which summarized the results of these interviews. The inspector expressed his concern that there was no independent verification of the training and experience of these individuals. The licensee president stated that a procedure would be developed to verify that the training and experience of new hires.

The inspector reviewed the training records for selected radiographers who work out of the Laurys Station office. He noted that one radiographer had not completed practical performance examination prior to his performing as a radiographer on December 28, 1984 and thereafter.

The failure to require an individual to complete a practical performance examination before he was permitted to perform radiography constitutes an apparent violation of Condition 17 of License No. 37-23370-01.

3. Audits

The inspector reviewed the records of licensee internal audits and discussed these audits with licensee representatives. Licensee representatives stated, and the records indicated, that each radiographer and radiographer's assistant who were involved in radiography had been audited during the fourth quarter of 1984.

Licensee representatives stated that Mr. S. Hopkins, who had assisted in the preparation of their original license application, would conduct an independent review of the licensee's radiation safety program during the week of January 21-25, 1985.

No violations were identified.

4. Survey Records

The inspector reviewed selected records of surveys performed by radiographer working out of the Laurys Station office and at the Monroeville, Pennsylvania, job site. He noted numerous instances in which the survey records indicated "2mR/hr" in all directions at the same distance over an extended period of time. The survey records did not appear to reflect the changing radiological conditions which would be expected for the varying field conditions. These field conditions included the use of directional collimation and the performance of radiography in a ditch. Licensee representatives acknowledged that greater review of these records was necessary and stated that they would reemphasize to their radiographers the importance of recording accurate data on their survey records.

No violations were identified.

5. Utilization Logs

The inspector reviewed the licensee's storage facility utilization log and observed the radiography devices which were currently in storage. He noted that exposure device #2757, an iridium-192 exposure device, was recorded in the log as being in storage. The inspector noted, however, that the device was not in the storage vault. Licensee representatives stated that source utilization logs are individually maintained for each device. The inspector reviewed the utilization logs for device #2757 and noted that they indicated that the device was in the field. Licensee representatives stated that an error had been made in recording that this device had returned from the field and that greater attention would be given to ensuring the accuracy of the storage facility utilization log.

No violations were identified.

6. Transportation

The inspector questioned what actions the licensee had taken to correct the violations of transportation requirements which had been identified during the October 19, 1984, NRC inspection. The licensee representatives stated that placards had been obtained for each vehicle and were being used while transporting radiographic exposure devices which required a Radioactive Yellow III label. The inspector observed proper placards on the sides of a licensee vehicle.

The licensee representatives stated that boxes had been installed in their vehicles to secure the radiographic exposure device to prevent shifting while in transit. The inspector observed that a box had been installed and secured to the floor of one of the licensee's vehicles.

Licensee representatives stated that Radioactive Yellow III labels were still not being affixed to radiographic exposure devices and stated their belief that the storage box inside the vehicle should be considered the "package" and should have this label affixed to it. The inspector questioned whether the licensee had affixed Radioactive Yellow III labels to any of the storage boxes. Licensee representatives stated that they had not yet done so because they were uncertain whether this practice would be acceptable to the NRC. The inspector stated that it was necessary that the required labelling be provided and licensee representative agreed to affix the label to the storage box when required, until they receive further guidance from the NRC on the acceptability of this practice.

No violations were identified.

7. Use of Laurys Station Facility

The inspector observed that no radiography was taking place in the Laurys Station facility at the time of the inspection. Licensee representatives stated that no radiography had been conducted at this facility since the NRC Confirmatory Action Letter dated October 26, 1984.

No violations were identified.

8. Field Site Inspection

Two radiographers and two trucks were inspected on January 16, 1985 on Route 22 near Lebanon, New Jersey. A local gas company was having an approximately 10-inch diameter pipeline laid along the roadside. Radiography of a pipeline weld was in progress at the start of the inspection. J. Maslowski was observed performing radiography; S. Simpson did not perform radiography during the inspection. The inspector reviewed the individuals' certification as Level II radiographers, the utilization logs and survey records. The inspector observed the performance of several radiographic exposures. He noted the use of personal monitoring equipment, survey meters and collimation. He also observed that the

radiographer surveyed the exposure device and guide tube after each exposure and provided direct surveillance to protect against unauthorized entry into a high radiation area. During the exposures, the inspector observed the proper placement of caution signs and that the radiographer surveyed the radiation levels in unrestricted areas. The inspector noted that the radiographer failed to secure the source in the shielded position after each exposure.

This failure constitutes an apparent violation of 10 CFR 34.22(a).

The inspector reviewed the licensee's compliance with DOT transportation requirements and observed the licensee's secured storage boxes inside trucks for transport of exposure devices and labeling of shipping containers. He noted that the shipping papers were completed properly.

9. Exit Interview

The inspector met with licensee representatives (denoted in paragraph 1) at the conclusion of the inspection on January 10, 1985. The inspector summarized the purpose and scope of the inspection. He expressed his concern that the licensee had not taken prompt actions to correct the DOT labeling violation identified during the October 19, 1984 inspection and to ensure that the survey records and utilization logs were being properly completed. Licensee representatives stated that they would take prompt actions with regard to these matters and that the individual who had not completed the required practical performance examination would complete this examination by January 12, 1985.

ATTACHMENT 3



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

Docket No. 30-20982
License No. 37-23370-01
EA 85-01

February 6, 1985

North American Inspection, Inc.
ATTN: Robert K. Shumway
President
P.O. Box 88
Laurys Station, Pennsylvania 18059

Gentlemen:

SUBJECT: NOTICE OF VIOLATION AND PROPOSED IMPOSITION OF CIVIL PENALTIES
(NRC INSPECTIONS 84-01 AND 85-01)

This refers to the NRC safety inspection conducted on October 18-19, 1984 at your office in Laurys Station, Pennsylvania, and at a radiography field site in Bethlehem, Pennsylvania, of activities authorized by NRC License No. 37-23370-01. The report of the inspection was forwarded to you on November 8, 1984. During the inspection, ten violations of NRC requirements were identified. On November 14, 1984, we held an enforcement conference with you and members of your staff during which these violations, their causes, and your corrective actions were discussed.

Another NRC safety inspection was conducted on January 10 and 16, 1985, at, respectively, your office in Laurys Station, Pennsylvania, and a radiography field site in Lebanon, New Jersey. The report of this inspection will be forwarded to you by separate correspondence. During the inspection, two violations of NRC requirements were identified.

These twelve violations, which were identified during the two inspections conducted by the NRC of your licensed activities, are of significant concern because they collectively indicate that adequate oversight and control of the radiation safety program was not exercised. These violations demonstrate the need for improvements in management control over licensed activities to assure adherence to NRC requirements and the safe performance of work.

To emphasize the importance of adequate control of the radiation safety program, I have been authorized, after consultation with the Director, Office of Inspection and Enforcement, to issue the enclosed Notice of Violation and Proposed Imposition of Civil Penalties in the amount of Five Thousand Dollars (\$5,000) for the violations set forth in the enclosed Notice. The violations have been classified in the aggregate as a Severity Level III problem in accordance with the NRC Enforcement Policy, 10 CFR Part 2, Appendix C, as revised, 49 FR 8583 (March 8, 1984). The base civil penalty amount for a Severity Level III problem is \$5,000.

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

8502130178

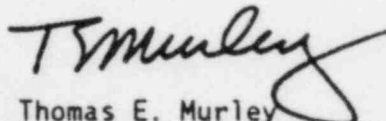
284

You are required to respond to the enclosed Notice and, in preparing your response, you should follow the instructions specified in the Notice. In your response, you should address the commitment made during the January, 1985 inspection to have a consultant perform a complete evaluation of your radiation safety program. Your response should include (1) the name and qualifications of the individual; (2) the specific aspects of the program to be covered by the assessment; and (3) the schedule for completion of the assessment. You should also provide this office a copy of the assessment report upon completion of the assessment. Your reply to this letter and the results of future inspections will be considered in determining whether further enforcement action is appropriate.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice", Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosure will be placed in the NRC's Public Document Room.

The responses directed by this letter and the enclosed Notice are not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act of 1980, PL 96-511.

Sincerely,


Thomas E. Murley
Regional Administrator

Enclosure: Notice of Violation and
Proposed Imposition of Civil Penalties

cc w/encls:
Public Document Room (PDR)
Nuclear Safety Information Center (NSIC)
Commonwealth of Pennsylvania

NOTICE OF VIOLATION
AND
PROPOSED IMPOSITION OF CIVIL PENALTIES

North American Inspection, Inc.
Laurys Station, Pennsylvania

Docket No. 30-20982
License No. 37-23370-01
EA 85-01

An NRC inspection of activities authorized under NRC License No. 37-23370-01 was conducted at a field site in Bethlehem, Pennsylvania, and at the Laurys Station, Pennsylvania, facility on October 18-19, 1984. Another NRC safety inspection was conducted on January 10 and 16, 1985, at, respectively, the licensee's office in Laurys Station, Pennsylvania, and a radiography field site in Lebanon, New Jersey. During these inspections, twelve violations of NRC requirements were identified. Collectively, these violations indicate that adequate management control and oversight of the radiological safety program was not exercised during radiography operations at the Bethlehem site and at the Laurys Station facility.

To emphasize the importance of adequate control of the radiation safety program, the Nuclear Regulatory Commission proposes the imposition of civil penalties in the amount of Five Thousand Dollars for these matters. In accordance with the revised NRC Enforcement Policy, 10 CFR Part 2, Appendix C, published in the Federal Register (49 FR 8583) on March 8, 1984, and pursuant to Section 234 of the Atomic Energy Act of 1954, as amended ("Act"), 42 U.S.C. 2282, PL 96-295, and 10 CFR 2.205, these particular violations and the associated civil penalties are set forth below:

- A. 10 CFR 34.31(a) requires that no individual act as a radiographer until that individual can demonstrate his understanding of the instructions which he has received regarding the subjects covered in Appendix A of Part 34 and has successfully completed a written test and a field examination on the subjects covered.

Contrary to the above on October 18, 1984, at a field site in Bethlehem, Pennsylvania, individuals were permitted to act as radiographers prior to demonstrating their understanding of the subjects outlined in Appendix A of Part 34, prior to passing a written test, and prior to demonstrating their competence to use the licensee's radiographic exposure devices, survey instruments, and related handling tools.

- B. 10 CFR 34.41 requires the radiographer or radiographer's assistant to maintain direct surveillance of the operation to protect against unauthorized entry into a high radiation area.

Contrary to the above, on October 18, 1984, at a field site in Bethlehem, Pennsylvania, a high radiation area existed in a building adjacent to the area where radiographic operations were being performed, and direct surveillance was not maintained to protect against unauthorized entry into the high radiation area.

- C. 10 CFR 20.105(b) requires that radiation levels in unrestricted areas be limited so that an individual who was continuously present in the area could not receive a dose in excess of 2 millirems in any hour or 100 millirems in any seven consecutive days.

Contrary to the above,

1. On October 18, 1984, at a field site in Bethlehem, Pennsylvania, radiation levels of 200 millirems per hour existed in an unrestricted area of an adjacent building when radiography was being conducted using a cobalt-60 source. Access to this area was not controlled for the purposes of radiation protection.
2. On October 4, 1984, radiation levels in excess of the limits set forth in 10 CFR 20.105(b) existed in a restaurant which is located 44 feet from the licensee's facility in Laurys Station, Pennsylvania in which radiography took place.

- D. 10 CFR 34.29(b) requires that each entrance used for personnel access to the high radiation area in a permanent radiographic installation have both visible and audible warning signals to warn of the presence of radiation. The visible signal is required to be actuated by radiation whenever the source is exposed and the audible signal is required to be actuated when an attempt is made to enter the installation while the source is exposed.

Contrary to the above, as of October 19, 1984, the permanent radiographic installation located in the Laurys Station, Pennsylvania, facility did not have the required warning signals installed.

- E. 10 CFR 71.5(a) requires that licensed material being transported comply with the applicable requirements of the regulations appropriate to the mode of transport of the Department of Transportation in 49 CFR Parts 170-189.

1. 49 CFR 172.403(c) requires that packages containing radioactive material with radiation levels in excess of 50 millirem per hour at the package surface or 1 millirem per hour at three feet be affixed with a Radioactive Yellow III label.

Contrary to the above, on October 19, 1984, a radioactive exposure device exhibiting radiation levels of 60 millirem per hour at the surface and 1-2 millirem per hour at three feet was transported without a Radioactive Yellow III label affixed to the device.

2. 49 CFR 172.504(a) requires that a vehicle carrying packages bearing the Radioactive Yellow III label be placarded on each end and each side with "Radioactive" placards.

Contrary to the above, on October 19, 1984, a radioactive exposure device that should have been labeled with a Radioactive Yellow III label was transported in a vehicle which was not properly placarded.

3. 49 CFR 173.448(a) requires each shipment of radioactive material to be secured in order to prevent shifting during normal transportation conditions.

Contrary to the above, on October 18, 1984, a radioactive exposure device was transported without being secured to the vehicle in order to prevent shifting during normal transport.

- F. 10 CFR 34.43(b) requires that a physical radiation survey be made after each radiographic exposure to determine that the sealed source has been returned to its shielded position. The entire circumference of the radiographic exposure device must be surveyed and, if the device has a source guide tube, the survey must include the entire length of the guide tube.

Contrary to the above, on October 18, 1984, a radiographer's assistant did not perform a survey that was adequate to determine that the sealed source had returned to its shielded position in that the survey did not include the entire circumference of the exposure device and the entire length of the guide tube.

- G. 10 CFR 34.27 requires that a utilization log be maintained indicating the plant or site where the radiation exposure devices are used.

Contrary to the above, on October 19, 1984, a cobalt-60 exposure device was used at a field site in Bethlehem, Pennsylvania, but such use was not indicated in the utilization log.

- H. 10 CFR 20.408(b) requires that a report be sent to the NRC of an individual's exposure to radiation when he terminates employment.

Contrary to the above, since April 5, 1984, four individuals terminated employment, but as of October 19, 1984, termination reports were not provided to the NRC.

- I. Condition 17 of License No. 37-23370-01 requires that licensed material be possessed and used in accordance with statements, representations, and procedures contained in the application dated January 31, 1984, and letters dated March 22, 1984, and May 4, 1984.

Item 5.3.3 on page 5.2 of the application dated January 31, 1984, requires that a person hired with radiographer credentials from another company complete a practical performance examination before being assigned to perform radiography.

Contrary to the above, as of January 11, 1985, a person hired with radiographer credentials from another company did not complete a practical performance examination before being assigned to perform radiography.

- J. 10 CFR 34.22(a) requires that, during radiography operations, the sealed source assembly be secured in the shielded position each time the source is returned to that position.

Contrary to the above, on January 16, 1985, a radiographer performed a number of radiographic exposures and cranked the source from the end of the guide tube to the shielded position in the exposure device each time, but did not secure the source between each exposure.

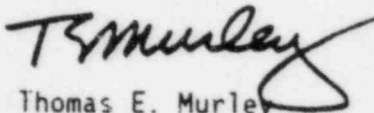
Collectively, these violations have been categorized in the aggregate as a Severity Level III problem (Supplements IV and VI). Cumulative Civil Penalties - \$5,000 assessed equally among the violations.

Pursuant to the provisions of 10 CFR 2.201, North American Inspection, Inc. is hereby required to submit to the Director, Office of Inspection and Enforcement, USNRC, Washington, D.C. 20555, with a copy to the Regional Administrator, Region I, 631 Park Avenue, King of Prussia, Pennsylvania 19406, within 30 days of the date of this Notice, a written statement or explanation in reply, including for each alleged violation (1) admission or denial of the alleged violation; (2) the reasons for the violation, if admitted; (3) the corrective steps that will be taken and the results achieved; (4) the corrective steps that will be taken to avoid further violations; and (5) the date when full compliance will be achieved. Consideration may be given to extending the response time for good cause shown. Under the authority of Section 182 of the Act, 42 U.S.C. 2232, this response shall be submitted under oath or affirmation.

Within the same time as provided for the response required above under 10 CFR 2.201, North American Inspection, Inc. may pay the civil penalties in the amount of Five Thousand Dollars (\$5,000) or may protest imposition of the civil penalties in whole or in part by a written answer. Should North American Inspection, Inc. fail to answer within the time specified, the Director, Office of Inspection and Enforcement, will issue an order imposing the civil penalties in the amount proposed above. Should North American Inspection, Inc. elect to file an answer in accordance with 10 CFR 2.205 protesting the civil penalties, such answer may: (1) deny the violations listed in this Notice in whole or in part; (2) demonstrate extenuating circumstances; (3) show error in this Notice; or (4) show other reasons why the penalties should not be imposed. In addition to protesting the civil penalties in whole or in part, such answer may request remission or mitigation of the penalties. In requesting mitigation of the proposed penalties, the five factors contained in Section V.B of the revised Enforcement Policy should be addressed. Any written answer in accordance with 10 CFR 2.205 should be set forth separately from the statement or explanation in reply pursuant to 10 CFR 2.201, but may incorporate by specific reference (e.g., citing page and paragraph numbers) to avoid repetition. The attention of North American Inspection, Inc. is directed to the other provisions of 10 CFR 2.205 regarding the procedure for imposing a civil penalty.

Upon failure to pay any civil penalties due, which have been subsequently determined in accordance with the applicable provisions of 10 CFR 2.205, this matter may be referred to the Attorney General, and the penalty, unless compromised, remitted, or mitigated, may be collected by civil action pursuant to Section 234c of the Act, 42 U.S.C. 22982.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in dark ink, appearing to read "T. Murley", with a stylized flourish at the end.

Thomas E. Murley
Regional Administrator

Dated at Bethesda, Maryland
this 6th day of February 1985.

ATTACHMENT 4



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406
SEP 09 1985

REC'D SEP 11 1985

Docket No. 30-20982

License No. 37-23370-01

North American Inspection, Inc.
ATTN: Robert K. Shumway
President
P.O. Box 88
Laurys Station, Pennsylvania 18059

Gentlemen:

Subject: Inspection No. 30-20982/85-02 and Enforcement Conference
No. 30-20982/85-03

This refers to the routine safety inspection conducted by Mr. J. Davis, Mr. J. Miller, and Mr. C. Rowe of this office on June 13, 14, and 26, 1985, of activities authorized by NRC License No. 37-23370-01. This also refers to the Enforcement Conference conducted at our office in King of Prussia, Pennsylvania, on July 9, 1985.

Areas examined during the inspection are described in the NRC Region I Inspection Report which is enclosed with this letter. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations and measurements by the inspectors. A report of the Enforcement Conference is also enclosed.

Based on the results of the June 13, 14 and 26 inspection, it appears that one of your activities was not conducted in full compliance with NRC requirements, as set forth in the Notice of Violation, enclosed herewith as Appendix A. This violation has been categorized by severity level in accordance with the revised NRC Enforcement Policy (10 CFR 2, Appendix C) published in the Federal Register Notice (49 FR 8583) dated March 8, 1984. Another activity identified during the inspection appears to be a deviation from a commitment, enclosed herewith as Appendix B. You are required to respond to this letter and in preparing your response you should follow the instructions in Appendices A and B.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and your reply will be placed in the Public Document Room.

The responses directed by this letter and the accompanying Notice are not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act of 1980, PL 96-511.

~~8509130292~~

2pp

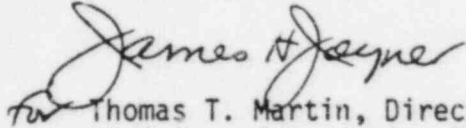
SEP 09 1985

North American Inspection, Inc.

2

Your cooperation with us in this matter is appreciated.

Sincerely,

A handwritten signature in dark ink, appearing to read "Thomas T. Martin". The signature is fluid and cursive, with the first name "Thomas" being more prominent.

Thomas T. Martin, Director
Division of Radiation Safety
and Safeguards

Enclosures:

1. Appendix A, Notice of Violation
2. Appendix B, Notice of Deviation
3. NRC Region I Inspection Report No. 30-20982/85-02
4. Enforcement Conference Report No. 30-20982/85-03

cc w/encls:

Public Document Room (PDR)

Nuclear Safety Information Center (NSIC)

Commonwealth of Pennsylvania

APPENDIX A
NOTICE OF VIOLATION

North American Inspection, Incorporated
Laurys Station, Pennsylvania

Docket No. 030-20982
License No. 37-23370-01

As a result of the inspection conducted on June 13, 14, and 26, 1985, and in accordance with the NRC Enforcement Policy (10 CFR 2, Appendix C), the following violation was identified:

1. 10 CFR 20.201(b) requires that each licensee make such surveys as may be necessary to comply with all sections of Part 20. As defined in 10 CFR 20.201(a), "survey" means an evaluation of the radiation hazards incident to the production, use, release, disposal, or presence of radioactive materials or other sources of radiation under a specific set of conditions.

Contrary to the above, surveys made outside the restricted area of the licensee's Laurys Station facility on June 8, 1985 were inadequate to assure compliance with 10 CFR 20.105(b), which limits radiation levels in unrestricted areas. Specifically, actual, accurate radiation measurements were not made; rather, apparently data were recorded which overestimated the distance from the source to the location where 2 mrem would be produced in one hour and thus did not represent the radiation levels that actually existed.

This is a Severity Level IV violation. (Supplement IV)

Pursuant to the provisions of 10 CFR 2.201, North American Inspection, Inc. is hereby required to submit to this office within thirty days of the date of the letter which transmitted this Notice, a written statement or explanation in reply, including: (1) the corrective steps which have been taken and the results achieved; (2) corrective steps which will be taken to avoid further violations; and (3) the date when full compliance will be achieved. Where good cause is shown, consideration will be given to extending this response time.

8509130294

18

APPENDIX B

NOTICE OF DEVIATION

North American Inspection, Incorporated
Laurys Station, Pennsylvania

Docket No. 030-20982
License No. 37-23370-01

As a result of the inspection conducted on June 13, 14, and 26, 1985, and in accordance with the NRC Enforcement Policy (10 CFR 2, Appendix C), the following deviation was identified:

The licensee's letter dated November 14, 1984 states that all isotope radiography has ceased at the licensee's Laurys Station facility until such time as the facility is properly prepared by installation of a visible and audible warning system.

Contrary to the above, on June 8, 1985, the licensee used the Laurys Station facility for isotope radiography and the visible and audible warning system had not been installed.

North American Inspection, Incorporated, is hereby requested to submit to this office within thirty days of the date of the letter transmitting this Notice, a written statement or explanation in reply, including: (1) the corrective steps which have been taken and the results achieved; and (2) corrective steps which will be taken to avoid further deviations.

8509130297

1p

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 30-20982/85-02

Docket No. 030-20982

License No. 37-23370-01 Priority 1 Category C1

Licensee: North American Inspection, Inc.
P.O. Box 88
Laurys Station, PA 18059

Facility Name: North American Inspection, Inc.

Inspection At: 3906 Main Street, Laurys Station, PA

Inspection Conducted: June 13, 14, and 26, 1985

Inspectors: J. Davis, Health Physicist

8/28/85
date

C. Rowe, Health Physicist

8/28/85
date

J. Miller, Health Physicist

8/28/85
date

Approved by: J. Kinneman, Chief, Nuclear Materials
Safety Section A

8/28/85
date

Inspection Summary: Special unannounced inspection of radiation safety
program on June 13, 14, and 26, 1985.

Areas Inspected: Organization, training and qualification of personnel,
records review, and use of materials, facilities and equipment.

Results: One apparent violation was identified: failure to perform
adequate radiation surveys in unrestricted area (paragraph 5). In addition,
one apparent deviation of a written commitment was identified: use of the
Laurys Station facility for isotope radiography (paragraph 5).

854913-0303

898

DETAILS

1. Persons Contacted

*Keith Shumway, President
Kerry Frack, Radiographer
George Weaver, Radiographer
Bryan Shumway, Radiographer

*Denotes those present at the exit interview.

2. Organization

Mr. K. Shumway is the President for North American Inspection, Inc. (NAII). The licensee possessed seven iridium-192 sources and one cobalt-60 source at the time of the inspection and employed six radiographers, including Mr. K. Shumway.

The licensee's January 3, 1984 license application states that Mr. Sam Hopkins is the Radiation Safety Officer for North American Inspection, Incorporated. However, Mr. Hopkins, in a letter to the NRC dated April 30, 1985 (Attachment 4), states that he is not, and never has been, the Radiation Safety Officer for this company. Mr. George Weaver is listed in the application as the Assistant Radiation Safety Officer and has been assisting Mr. Shumway in performing this function. The application further states that the Assistant Radiation Safety Officer may exercise all duties and responsibilities of the Radiation Safety Officer in his absence. Furthermore, both Mr. Shumway and Mr. Weaver have the qualifications required to be approved by the NRC as the Radiation Safety Officer.

No violations were identified.

3. Training and Qualification of Personnel

On June 13 and 14, 1985, the inspector reviewed the licensee's training records for radiographers Bryan Shumway, Donna Frack, Larry Thompson and David Hopkins.

Mr. Bryan Shumway had 40 hours of radiation safety training provided by Imperial Inspection Incorporated, Lafayette, Louisiana. The Radiation Safety Test that he took for NAII on June 12, 1983 was scored as 87½%. Mr. Don Shumway was the instructor. Mr. Bryan Shumway passed the Radiographer Examination on February 26, 1985 and received a 98% score; he passed the Radiographic Procedure Exam on February 27, 1985 and received 96% score; and he passed the practical performance examination on February 27, 1985.

Mrs. Donna Frack had 40 hours of radiation safety training provided by Imperial Inspection Incorporated, on June 12, 1983. Mrs. Frack passed the NAII Radiographer Examination on April 17, 1984 and received a 70% score; she passed the Radiographic Procedure Exam on April 19, 1984 and received a 80% score; and she passed the practical performance examination on February 25, 1985.

Mr. Larry Thompson, an experienced radiographer, started with NAII on February 13, 1984. He passed the Radiographic Procedure Exam on April 19, 1984 with a 95% score; passed the Radiographer Examination on April 19, 1984 with a 82% score; and he passed the practical performance exam on April 19, 1984.

Mr. David Hopkins' training records could not be found at NAII during the inspection. A licensee representative stated that all training was handled by Mr. Sam Hopkins and all training and testing were provided by Mr. Hopkins for this son, David. A copy of these training records was provided during the Enforcement Conference conducted at the NRC Region I office on July 9, 1985. These records indicated that Mr. Hopkins had received the training required by 10 CFR 34.31.

On June 26, 1985, the inspectors reviewed records of required annual retraining for radiographers. The inspectors noted that records of Radiographer's Periodic Refresher Training (Attachments 1 and 2) for two individuals indicated that they had received fourteen and ten and one-half hours training, respectively, on February 26, 1985. The inspectors noted that a Daily Radiation Survey Report (Attachment 3) indicated that the two individuals had performed radiographic operations in Boyertown, Pennsylvania on February 26, 1985. The inspectors discussed this with the company president and he stated that the training was received during the day and the radiography was performed on an evening shift. The radiographers were not available for interview by the inspectors.

No violations were identified.

4. Records Review

On June 13 and 14, 1985, the inspector reviewed the licensee's utilization logs. It was noted that the licensee maintains a utilization log containing the make and model number of the exposure device, the identity of the radiographer, the plant or site where used, and the dates of use.

On June 26, 1985, the inspectors reviewed records associated with the licensee's program, including daily radiation survey reports, leak testing, survey instrument calibration, quarterly maintenance, quarterly inventory, personnel monitoring, and radiation survey reports.

No violations were identified.

5. Use of Materials, Facilities and Equipment

Initially the licensee president stated that no gamma radiography was performed at the Laurys Station address, only x-ray radiography. However, discussions with the licensee president subsequently indicated that the only time gamma radiography was performed at the Laurys Station facility was on June 8, 1985. The licensee had stated in the letter which it provided to the NRC at the Enforcement Conference on November 13, 1984 that ".... all isotope exposure work has ceased ...until such time as the facility is properly prepared" (referring to installation of a visible and audible warning system).

The finding that the licensee performed radiography with iridium-192 on June 8, 1985 constitutes a deviation from its commitment to cease such work until the facility was properly prepared.

During the gamma radiography that was performed on June 8, 1985 at NAII, Laurys Station, the records of the physical radiation survey indicate that "2 mr" was present at 50 feet from the North, East and South and at 70 feet from the West. The report states that signs, constant surveillance and a tungsten collimator were used. In addition, the report stated that the total number of exposures taken on June 8, 1985 was 36 and the total time the source was exposed was seven minutes.

The inspector made radiation surveys outside of the Laurys Station facility while a simulated exposure was positioned in the same location as indicated on the June 8, 1985 survey report, using a 53-curie iridium-192 source. The inspector used an Eberline Instrument Corporation Model E-120G Geiger Counter, calibrated on April 26, 1985 by Brookhaven National Laboratory. The highest radiation level in the unrestricted areas which existed outside the facility was 20 millirem per hour. Background levels were observed on the porch of the private home located adjacent to the nearby Hiway Restaurant.

The licensee representative estimated the average time for each of the June 8, 1985 exposures to be 15 seconds and stated that the radiographs were taken over a six-hour period. If the radiographer took an average of six exposures per hour, then the total time of the exposure would be 90 seconds in one hour. An exposure rate in the unrestricted area of 80 mrem per hour for 90 seconds would be necessary to produce 2 mrem in any one hour, the limit for an unrestricted area. Since the highest exposure rate measured by the inspectors was only 20 mrem per hour, no violation is believed to have occurred.

However, the inspector questioned the licensee representative about the accuracy of the survey information on the June 8, 1985 Daily Radiation Survey report. The licensee president acknowledged that the information provided on the Daily Radiation Survey report apparently did not represent accurate or actual survey data for June 8, 1985. He stated that the distance from the source to the "2 mR" line (information that was recorded on the survey report) was a "guesstimation."

The finding that the licensee's survey in the unrestricted area outside the Laurys Station facility on June 8, 1985 was inaccurate and therefore inadequate to assure compliance with 10 CFR 20.105(b) represents an apparent violation of 10 CFR 20.201(b).

6. Exit Interview

The inspectors met with licensee representatives (denoted in paragraph 1) at the conclusion of the inspection on June 14 and June 26, 1985. The inspectors summarized the scope and findings of the inspection.



NORTH AMERICAN INSPECTION, INC.

P.O. BOX 88
LAURYS STATION, PA. 18059

FORM RS-5-2 (4184)

(RIVO)

RADIOGRAPHER'S PERIODIC REFRESHER TRAINING

As required by CFR Part 34 Paragraph 34.11 Sub-paragraph (b)(2) and in N.A.I.I.s' N.R.C. License condition as contained in License Application Part 5 Paragraph 5.

I. RADIOGRAPHERS NAME Kerry M Frack SOCIAL SECURITY # II. Date of Original Radiographers Certification by N.A.I.I. 4-19-84III. SUBJECT(S) REVIEWED Liberal TYPE REVIEW: Oral X Written 7 Demo 7

1. Review and critique of internal radiographers experience
2. Discussing of available radiographers experience
3. Review and discuss personnel doses and reduction
4. New procedures and regulations
5. Review critical operating and emergency procedures (posting requirements)
6. Review at least one fundamental radiation topic (radiation posting)
7. Review Radiographer's Performance Review

IV. Time allotted to Subjects 1. 1 hr. 2. 1/2 hr 3. 1/2 hr 4. 1/2 hr 5. 2 hrs 6. 2 hrs 7. 4 hrs

V. Radiation Safety Officers review and comments.

Comments This radiographer was subjected to intense questions and answers as a result of a posting violation for radiation area. He was also subjected to intense use of NAI's transportation procedures

VI. STATEMENT OF UNDERSTANDING

I Kerry M. Frack do herewith express understanding and the purpose of subjects contained in III. Items 1 thru 7. 2-26-85

VII. CERTIFICATION

I certify that the foregoing review was conducted by me. An interview was entertained with the Radiographer to further his understanding of N.A.I.I.s' RSO Program.

Signed Em. Hyman Date February 24, 1985 Next Review Required 2/26/86

Note: Please see results of unannounced audit conducted Saturday, February 23, 1985



Joel Guthrie

NORTH AMERICAN INSPECTION, INC.

P.O. BOX 88
LAURYS STATION, PA. 18059

FORM RS-5-2 (4184)

(RIVO)

RADIOGRAPHER'S PERIODIC REFRESHER TRAINING

As required by CFR Part 34 Paragraph 34.11 Sub-paragraph (b)(2) and in N.A.I.I.s' N.R.C. License condition as contained in License Application Part 5 Paragraph 5.

I. RADIOGRAPHERS NAME David M. Hopkins SOCIAL SECURITY #

II. Date of Original Radiographers Certification by N.A.I.I. 4-19-84

III. SUBJECT(S) REVIEWED 1 thru 6 TYPE REVIEW: Oral X Written 7 Demo 7

1. Review and critique of internal radiographers experience
2. Discussing of available radiographers experience
3. Review and discuss personnel doses and reduction
4. New procedures and regulations
5. Review critical operating and emergency procedures
6. Review at least one fundamental radiation topic
7. Review Radiographer's Performance Review

IV. Time allotted to Subjects 1. 2hrs 2. 2hrs 3. 2hrs 4. 2hrs 5. 2hrs 6. 2hrs 7. 2hrs

V. Radiation Safety Officers review and comments.

Comments particular emphasis on (1) transportation (2) U.S. NRC
Compliance inspections (3) unannounced audit covered
in item 7 above

VI. STATEMENT OF UNDERSTANDING

I David M. Hopkins do herewith express understanding and the purpose of subjects contained in III. Items 1 thru 7. David M. Hopkins

VII. CERTIFICATION

I certify that the foregoing review was conducted by me. An interview was entertained with the Radiographer to further his understanding of N.A.I.I.s' RSO Program.

Signed Sm/Hopkins Date February 26, 1985 Next Review Required 2/26/86

DAILY RADIATION SURVEY REPORT

Page 35
Form RS-4-4 (Rev. 0)
(1-84)

RADIOGRAPHER KERRY M. FRACK JOB LOCATION BOYCATOWN, PA.

Tues. Feb 24, 1985 TIME 8:30 PROJECT Cryo Chem

1. SOURCE OF RADIATION: IR-192 ☒ S/N 32.124, CO-60 ☐ S/N , X-RAY ☐ S/N
2. CURIES: 52 X-RAY KV-MA MAXIMUM:
- SURVEY METER NO. 31292 CALIBRATION DUE DATE 3-24-85
- CAMERA MODEL NO. Century S MANUFACTURER Gamma Ind. S/N 2832
5. DAILY EQUIPMENT CHECK PERFORMED? (Form No. RS-4-3) EQUIPMENT ACCEPTABLE? YES ☒ NO ☐
- RADIOGRAPHER DOSIMETER S/N 4040723 DATE CALIBRATION DUE 4-19-85
- ASST. RADIOGRAPHER DOSIMETER S/N 4040724 DATE CALIBRATION DUE 4-19-85
8. RADIOGRAPHER FILM BADGE S/N 00004 ASST. RADIOGRAPHER FILM BADGE NO. 00019
- SOURCE DECAY CURVE IN LOG BOOK? YES ☒ NO ☐
- SOURCE TRANSPORTATION DOCUMENTS IN LOG BOOK? YES ☒ NO ☐
- U. RADIOGRAPHY MANUAL S/N #5, 3 OR MORE RADIATION SIGNS IN LAB/SITE? YES ☒ NO ☐
1. DOSIMETER RECORD RECEIVED: RADIOGRAPHER: (START 0 MR FINISH 0 MR) Wmt
ASSISTANT RADIOGRAPHER: (START 0 MR FINISH 5 MR) DMH
2. TOTAL EXPOSURE TIME FOR SHIFT/DAY: HOURS, 4 MINUTES 15 SEC.
- PERSONNEL NOTIFIED OF RADIATION AREAS, WHERE APPLICABLE? YES ☒ NO ☐ Empty Shop
- CONSTANT SURVEILLANCE? YES ☒ NO ☐ DID YOU USE ROPES? YES ☐ NO ☒
- DID YOU USE SIGNS? YES ☒ NO ☐ WAS A COLLIMATOR USED? YES ☒ NO ☐
6. RECORD OF PHYSICAL SURVEY MADE TO DETERMINE SOURCE IS IN SHIELDED POSITION PRIOR TO SECURING EXPOSURE DEVICE Yes
- a. IRIIDIUM 192 12 MR/HR AT 6 INCHES FROM SURFACE. ON CONTACT 65 MR/HR
- b. COBALT 60 MR/HR AT SURFACE OF EXPOSURE DEVICE.

16. VEHICLE STORAGE SURVEY:

- 1a. LEAVE: 27 MR/HR AT DRIVER, 27 MR/HR AT OUTSIDE SURFACE, 27 MR/HR AT 1 FT. FROM SURFACE
- 1b. RETURN: 27 MR/HR AT DRIVER, 27 MR/HR AT OUTSIDE SURFACE, 27 MR/HR AT 1 FT. FROM SURFACE

EXPOSURE AREA A, B, OR C AS MAY BE APPLICABLE, WHERE MORE THAN ONE (1) EXPOSURE CONDITION EXISTS PER WORK SHIFT, RECORD IN EXPOSURE AREA A, B, OR C:

RESULT OF PHYSICAL SURVEY

40 MR
15 ft

SOURCE

40 MR
20 ft

40 MR
40 ft

BARRICADE EQUIPMENT

☐ SIGNS ☐ ROPES

☐ CONSTANT SURVEILLANCE

☐ COLLIMATOR

RESULT OF PHYSICAL SURVEY

40 MR
45 ft

SOURCE

40 MR
20 ft

40 MR
40 ft

BARRICADE EQUIPMENT

☒ SIGNS ☐ ROPES

☒ CONSTANT SURVEILLANCE

☒ COLLIMATOR

2 3/8" GLASS

RESULT OF PHYSICAL SURVEY

60 MR
35 ft

SOURCE

60 MR
15 ft

60 MR
50 ft

BARRICADE EQUIPMENT

☒ SIGNS ☐ ROPES

☒ CONSTANT SURVEILLANCE

☒ PANORAMIC EXPOSURE

3/16" material

ANY VARIATIONS IN PHYSICAL SURVEYS SHOULD BE NOTED AND SKETCHED ON THE REVERSE SIDE OF THIS FORM.

Kerry M. Frack

David M. Zedler

U

April 30, 1985

U.S.N.R.C. - Region I
631 Park Avenue
King of Prussia, Pennsylvania 19406

Attention: Mr. Thomas T. Martin, Director
Division of Radiation Safety and Safe Guards

Subject: North American Inspection, Inc.'s Safety Program

Reference: U.S.N.R.C. License #37-23370-01

Dear Mr. Martin:

This letter is to advise you that I do not and have not maintained an administrative position in the Radiation Safety Program of this company since its inception.

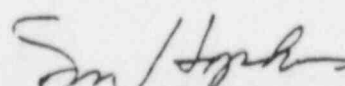
My participation has from its inception been one of a consulting basis and possessed no authority with reference to implementation of North American Inspection, Inc.'s Radiation Safety Program and/or the Rules and Regulations as defined by applicable parts of Title 10 contained in the Nuclear Regulations covering license facilities to use radioactive materials.

Further, I do not have knowledge of the day to day enforcement of North American Inspection, Inc.'s Radiation Safety Program.

The work performed by me was defined in a predetermined agenda by Mr. Shumway and my work was limited to same.

The purpose of this letter is to establish that I am not and have never been the R.S.O. for this company.

Respectfully submitted,


S. M. Hopkins, P.E.
7300 St. Peters Church Rd. N.E.
Louisville, Ohio 44641
(216) 877-1459

jb

cc: T.E. Murley, Regional Administrator
R.K. Shumway, N.A.I.I.

8506270120

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 30-20982/85-03

Docket No. 030-20982

License No. 37-23370-01 Priority 1 Category C1

Licensee: North American Inspection, Inc.
P.O. Box 88
Laurys Station, PA 18059

Enforcement Conference at: King of Prussia, Pennsylvania

Enforcement Conference Conducted: July 9, 1985

Prepared by: F. Costello 5/28/85
F. Costello, Senior Radiation Specialist date

Conference Summary: Enforcement Conference held at the Region I office in King of Prussia on July 9, 1985 to discuss the apparent violations identified during an inspection conducted June 13, 14, and 26, 1985, and licensee corrective actions.

8509130318

3pp

1. Attendance

North American Inspection, Inc.

Robert K. Shumway, President
Sam Hopkins, Consultant

NRC Region I

J. Allan, Deputy Regional Administrator
T. Martin, Director, Division of Radiation Safety and Safeguards
J. Joyner, Chief, Nuclear Materials Safety and Safeguards Branch
D. Holody, Enforcement Specialist
F. Costello, Senior Radiation Specialist
J. Gutierrez, Regional Attorney

2. Summary

On July 9, 1985, licensee representatives met with representatives of the Nuclear Regulatory Commission, Region I in King of Prussia, Pennsylvania.

During the meeting, Region I representatives discussed the apparent violations identified during the inspection conducted on June 13, 14 and 26, 1985 and their concern that the Laurys Station facility had been used for radiography involving licensed materials after a commitment had been made during Enforcement Conference 30-20982/84-02 to cease using this facility. Region I representatives emphasized the importance of ensuring the accuracy of all records required by the license and all information provided to the NRC.

Licensee representatives acknowledged that a need existed for a review of their program by another outside consultant and expressed their willingness to cease using the Laurys Station facility for radiography. They stated that the use that occurred was a mistake because the radiographer involved had been expected to use an x-ray machine rather than the iridium-192 source which he used.

The licensee provided a copy of the training of Mr. David Hopkins which was not available during the June, 1985 inspection.

The licensee president stated that he would contact Region I by July 31, 1985 and describe his plans to review and upgrade the radiation safety program.

Enforcement options available to the NRC were discussed.

ATTACHMENT 5



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

AUG 07 1985

Docket No. 30-20982
License No. 37-23370-01
EA 85-01

North American Inspection, Inc.
ATTN: Robert K. Shumway
President
P.O. Box 88
Laurys Station, Pennsylvania 18059

Gentlemen:

This refers to your letters dated February 21, 26, and April 10, 1985, in response to the Notice of Violation and Proposed Imposition of Civil Penalties sent to you with our letter dated February 6, 1985. In your letters you (1) deny some of the violations and admit others; (2) request reduction of the severity level of the violations; and (3) request that the civil penalties be withdrawn, claiming that the imposition of the civil penalties will place a severe financial burden on the company.

After carefully considering your response, we have concluded for the reasons provided in the evaluations and conclusions set forth in the enclosed Appendix, that the violations did occur as stated and collectively represent a breakdown in management control of your radiation safety program. Further, after review of your financial statement submitted with your April 10 letter, the NRC is not convinced that your company lacks the resources to pay the proposed civil penalties. Accordingly, we have decided to impose the proposed civil penalties.

In your February 26, 1985 letter, you state that you have no authority to legislate behavior on behalf of your employees to comply with your Radiation Safety Program and/or the rules and regulations of the NRC. However, the NRC Enforcement Policy clearly states that licensees are responsible for the acts of their employees. Therefore, you must establish management controls and surveillance to ensure that your employees comply with the radiation safety program and all requirements of NRC regulations and license conditions. Failure of you or your employees to adhere to the conditions of your license may lead to future escalated enforcement action.

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

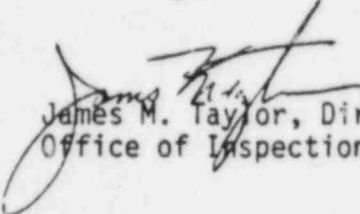
8538-2 0673

2-PP

North American Inspection, Inc. - 2 -

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosed Order will be placed in the Public Document Room.

Sincerely,


James M. Taylor, Director
Office of Inspection and Enforcement

Enclosures:

1. Order Imposing Civil Monetary Penalties
2. Appendix - Evaluation and Conclusion

cc w/encls:

Public Document Room (PDR)
Nuclear Safety Information Center (NSIC)
Commonwealth of Pennsylvania

UNITED STATES
NUCLEAR REGULATORY COMMISSION

In the Matter of

North American Inspection, Inc.
3906 Main Street
P.O. Box 88
Laurys Station, Pennsylvania 18059

Docket No. 30-20982
License No. 37-23370-01
EA 85-01

ORDER IMPOSING CIVIL MONETARY PENALTIES

I

North American Inspection, Inc., 3906 Main Street, P.O. Box 88, Laurys Station, Pennsylvania, (the "licensee") is the holder of License No. 37-23370-01 (the "license") issued by the Nuclear Regulatory Commission (the "NRC") which authorizes the licensee to possess and use radioactive materials in accordance with conditions specified therein. License No. 37-23370-01 was issued on April 5, 1984.

II

A safety inspection of the licensee's activities under the license was conducted on October 18-19, 1984 at the licensee's facility in Laurys Station, Pennsylvania, and at a radiography field site in Bethlehem, Pennsylvania. Another NRC safety inspection was conducted on January 10, 1985 at the licensee's facility in Laurys Station, Pennsylvania, and on January 16, 1985 at a radiography field site in Lebanon, New Jersey. As a result of the inspections, the NRC staff determined that the licensee had not conducted its activities in full compliance with NRC requirements. A written Notice of Violation and Proposed Imposition of Civil Penalties was served upon the licensee by letter dated February 6, 1985. The Notice stated the nature of the violations, the provisions of the NRC's requirements that the licensee had violated, and the amount of the civil

8508120679

1240

penalties. Responses dated February 21 and 26, 1985 to the Notice of Violation and Proposed Imposition of Civil Penalties were received from the licensee. In addition, at the request of the NRC, a financial statement was provided by the licensee by letter dated April 10, 1985.

III

Upon consideration of the licensee's responses and the statements of fact, explanations, and arguments for remission or mitigation of the proposed civil penalties contained therein, as set forth in the Appendix to this Order, the Director, Office of Inspection and Enforcement, has determined that the violations occurred as stated and that the penalties proposed for the violations designated in the Notice of Violation and Proposed Imposition of Civil Penalties should be imposed.

IV

In view of the foregoing and pursuant to Section 234 of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2282, PL 96-295), and 10 CFR 2.205, IT IS HEREBY ORDERED THAT:

The licensee pay civil penalties in the amount of Five Thousand Dollars (\$5,000) within thirty days of the date of this Order, by check, draft, or money order, payable to the Treasurer of the United States and mailed to the Director of the Office of Inspection and Enforcement, USNRC, Washington, D.C. 20555.

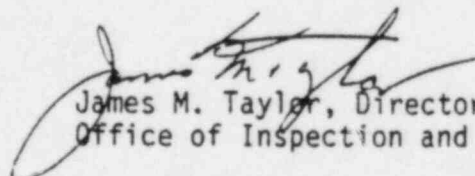
The licensee may, within thirty days of the date of this Order, request a hearing. A request for a hearing shall be addressed to the Director, Office of Inspection and Enforcement. A copy of the hearing request shall also be sent to the Executive Legal Director, USNRC, Washington, D.C. 20555. If a hearing is requested, the Commission will issue an Order designating the time and place of the hearing. Upon failure of the licensee to request a hearing within thirty days of the date of this Order, the provisions of this Order shall be effective without further proceedings and, if payment has not been made by that time, the matter may be referred to the Attorney General for collection.

VI

In the event the licensee requests a hearing as provided above, the issues to be considered at such hearing shall be:

- (a) whether the licensee violated NRC requirements as set forth in the Notice of Violation and Proposed Imposition of Civil Penalties; and
- (b) whether, on the basis of such violations, this Order should be sustained.

FOR THE NUCLEAR REGULATORY COMMISSION


James M. Taylor, Director
Office of Inspection and Enforcement

Dated at Bethesda, Maryland
this 7th day of August 1985

APPENDIX

Evaluation and Conclusion

In the licensee's February 21 and 26, 1985 and April 10, 1985 responses to the Notice of Violation and Proposed Imposition of Civil Penalties dated February 6, 1985, the licensee denies some of the violations and admits others; requests reduction of the severity level of the violations; and requests that the penalties be waived, claiming that imposition of the civil penalties will be a financial burden to the company. Provided below are (1) a restatement of each violation; (2) a summary of the licensee's response regarding each violation; and (3) the NRC's evaluation of the licensee's response.

Restatement of Violation A:

10 CFR 34.31(a) requires that no individual act as a radiographer until that individual can demonstrate his understanding of the instructions which he has received regarding the subjects covered in Appendix A of Part 34 and has successfully completed a written test and a field examination on the subjects covered.

Contrary to the above, on October 18, 1984, at a field site in Bethlehem, Pennsylvania, individuals were permitted to act as radiographers prior to demonstrating their understanding of the subjects outlined in Appendix A of Part 34, prior to passing a written test, and prior to demonstrating their competence to use the licensee's radiographic exposure devices, survey instruments, and related handling tools.

Summary of Licensee's Response Regarding Violation A:

The licensee concedes that, for Individual B, management did not produce documents to support Individual B's radiographer status at the time of the inspection.

NRC Evaluation of Licensee's Response Regarding Violation A:

At the time of the inspection, the licensee's President (who was also the acting Radiation Safety Officer), the licensee's Operations Manager, and Individual A, who is the husband of Individual B, each told the NRC inspectors that Individual B was only qualified to be a Radiographer's Assistant. At the time of the inspection and at the enforcement conference on November 14, 1984, the licensee did not provide any information to indicate that Individual B had completed all training requirements of the

license and 10 CFR 34. A recent inspection conducted on June 13 and 14, 1985 at NAI revealed that Individual B had completed the radiographer's examination in April 1984, but did not complete the required practical factors test until February 1985. Since Individual B performed as a radiographer without having satisfied the required program for qualification, the violation remains as stated.

The fact that Individual C also performed as a radiographer without completing the required training was not disputed in the licensee's response. Therefore, the violation remains as proposed.

Restatement of Violation B:

10 CFR 34.41 requires the radiographer or radiographer's assistant to maintain direct surveillance of the operation to protect against unauthorized entry into a high radiation area.

Contrary to the above, on October 18, 1984, at a field site in Bethlehem, Pennsylvania, a high radiation area existed in a building adjacent to the area where radiographic operations were being performed, and direct surveillance was not maintained to protect against unauthorized entry into the high radiation area.

Restatement of Violation C.1:

10 CFR 20.105(b) requires that radiation levels in unrestricted areas be limited so that an individual who was continuously present in the area could not receive a dose in excess of 2 millirems in any hour or 100 millirems in any seven consecutive days.

Contrary to the above, on October 18, 1984, at a field site in Bethlehem, Pennsylvania, radiation levels of 200 millirems per hour existed in an unrestricted area of an adjacent building when radiography was being conducted using a cobalt-60 source. Access to this area was not controlled for the purposes of radiation protection.

Summary of Licensee's Response Regarding Violations B and C.1:

The licensee's response states that as a service company they were subordinate to Bethlehem Steel Corporation's Radiation Safety Program. The licensee's consultant states that the NRC inspector did not identify the area correctly, access was limited and posted, and surveillance was maintained. The consultant further states, "...where the readings were taken by the inspector in the adjacent bay was at an overhead roll-up position and was the worst exposure condition for the day..."

NRC Evaluation of Licensee's Response Regarding Violations B and C.1:

The licensee's contention that it is subordinate to Bethlehem Steel's Radiation Safety Program is incorrect, and demonstrates an inadequate

understanding of the responsibilities of an NRC licensee. The inspectors observed that licensee personnel did not survey and control access to the storage bay adjacent to the end of the building where radiography was taking place, and in this area, the NRC inspector measured a radiation dose rate of 200 millirem per hour. Although the licensee contends that Bethlehem was aware of its radiography activity and restricted personnel from being in the area, Bethlehem Steel representatives informed the inspectors that their Fire Marshall was required to enter this area periodically during his routine tours of the Bethlehem facility. The licensee acknowledges that it did not maintain direct surveillance of this area. Therefore, the violations remain as proposed.

Restatement of Violation C.2:

10 CFR 20.105(b) requires that radiation levels in unrestricted areas be limited so that an individual who was continuously present in the area could not receive a dose in excess of 2 millirems in any hour or 100 millirems in any seven consecutive days.

Contrary to the above, on October 4, 1984, radiation levels in excess of the limits set forth in 10 CFR 20.105(b) existed in a restaurant which is located 44 feet from the licensee's facility in Laurys Station, Pennsylvania in which radiography took place.

Summary of Licensee's Response Regarding Violation C.2:

The licensee contends that the radiation levels outside the licensee's facility in Laurys Station, Pennsylvania never exceeded the limits of 10 CFR 20.105.

NRC Evaluation of Licensee's Response Regarding Violation C.2:

The licensee's survey report for October 4, 1984, which was examined at the time of the NRC inspection, indicated that a radiation level of two millirems per hour existed at 200 feet from the source in all directions. While the licensee now contends that this recorded survey is in error, the licensee does not provide the reasons why the record of the survey was incorrect, and did not provide any information in their response regarding the actual radiation levels measured by the radiographer in the unrestricted area in the vicinity of the Laurys Station facility. This would include the areas outside the unshielded bay doors on the south side of the facility, and all other areas to which access is not controlled by the licensee. Therefore, the violation remains as proposed.

Restatement of Violation D:

10 CFR 34.29(b) requires that each entrance used for personnel access to the high radiation area in a permanent radiographic installation have both visible and audible warning signals to warn of the presence of radiation. The visible signal is required to be actuated by radiation whenever the

source is exposed and the audible signal is required to be actuated when an attempt is made to enter the installation while the source is exposed.

Contrary to the above, as of October 19, 1984, the permanent radiographic installation located in the Laurys Station, Pennsylvania facility did not have the required warning signals installed.

Summary of Licensee's Response Regarding Violation D:

The licensee contends that the facility located in Laurys Station, Pennsylvania is not a permanent radiographic installation.

NRC Evaluation of Licensee's Response Regarding Violation D:

10 CFR 34.29 defines a permanent radiographic installation as "...a shielded installation or structure designed or intended for radiography and in which radiography is regularly performed."

In their response, the licensee indicates that the Laurys Station facility is a shielded structure and also indicates that two different radiography firms have performed radiography there since at least 1979. Further, information supplied by the licensee to the NRC indicated that this facility was used regularly between April and October 1, 1984. Since the facility is shielded, apparently intended for radiography, and radiography was regularly performed there, the Laurys Station facility met the definition of a "permanent radiographic installation" as defined by 10 CFR 34.2(h). Therefore, since the required warning signals were not installed, a violation of 10 CFR 34.29 remains as proposed.

Restatement of Violations E.1, E.2, and E.3:

10 CFR 71.5(a) requires that licensed material being transported comply with the applicable requirements of the regulations appropriate to the mode of transport of the Department of Transportation in 49 CFR Parts 170-189.

1. 49 CFR 172.403(c) requires that packages containing radioactive material with radiation levels in excess of 50 millirem per hour at the package surface or 1 millirem per hour at three feet be affixed with a Radioactive Yellow III label.

Contrary to the above, on October 19, 1984, a radioactive exposure device exhibiting radiation levels of 60 millirem per hour at the surface and 1-2 millirem per hour at three feet was transported without a Radioactive Yellow III label affixed to the device.

2. 49 CFR 172.504(a) requires that a vehicle carrying packages bearing the Radioactive Yellow III level be placarded on each end and each side with "Radioactive" placards.

Contrary to the above, on October 19, 1984, a radioactive exposure device that should have been labeled with a Radioactive Yellow III label was transported in a vehicle which was not properly placarded.

3. 49 CFR 173.448(a) requires each shipment of radioactive material to be secured in order to prevent shifting during normal transportation conditions.

Contrary to the above, on October 18, 1984, a radioactive exposure device was transported without being secured to the vehicle in order to prevent shifting during normal transportation.

Summary of Licensee's Response Regarding Violations E.1, E.2, and E.3:

The licensee states "...management personnel disclosed that there exists a lack of understanding in part of this procedure," referring to 49 CFR 171 through 177. The licensee contends that the NRC inspector did not witness the use of the truck, but obtained hearsay information from a licensee employee and contends that the materials were in storage. The licensee also contends that the procedure in its manual specifies compliance with DOT regulations.

NRC Evaluation of Licensee's Response Regarding Violations E.1, E.2, and E.3:

At the time of the inspection, the inspectors were informed by licensee personnel that the vehicle they had inspected was used the previous day to transport licensed material and that the truck was in the same condition when the inspectors observed it as it was the previous day.

The NRC utilizes observations by the inspectors, statements by licensee personnel, records maintained by the licensee and measurements made by inspectors as the bases for determining compliance with NRC regulations and license conditions. In this instance, NRC measurement of the radiation levels from the package in question and statements from licensee employees concerning the conditions of transport of the package provided the bases for the violation. Further, regarding the licensee's procedures which specify compliance with DOT regulations, the failure to implement these procedures and comply with the appropriate regulations were the bases for the violation. Therefore, the violations remain as proposed.

Restatement of Violation F:

10 CFR 34.23(b) requires that a physical radiation survey be made after each radiographic exposure to determine that the sealed source has been returned to its shielded position. The entire circumference of the radiographic exposure device must be surveyed and, if the device has a source guide tube, the survey must include the entire length of the guide tube.

Contrary to the above, on October 18, 1984, a radiographer's assistant did not perform a survey that was adequate to determine that the sealed source had returned to its shielded position in that the survey did not include the entire circumference of the exposure device and the entire length of the guide tube.

Summary of Licensee's Response Regarding Violation F:

The licensee acknowledges the violation, but contends the requirement's intent was fulfilled. The licensee urges these requirements be administered and implemented with discretion.

NRC Evaluation of Licensee's Response Regarding Violation F:

The meaning of the requirement is clear; namely, that a complete survey of the entire circumference of the exposure device and the entire length of the guide tube must be made after each radiographic exposure. The inspectors observed that neither Individual B nor Individual C performed these surveys as required. Therefore, the violation remains as proposed. The inspector noted that Individual A, the only qualified individual performing radiography the day of the inspection, did survey the guide tube.

Restatement of Violation G:

10 CFR 34.27 requires that a utilization log be maintained indicating the plant or site where the radiation exposure devices are used.

Contrary to the above, on October 19, 1984, a cobalt-60 exposure device was used at a field site in Bethlehem, Pennsylvania, but such use was not indicated in the utilization log.

Summary of Licensee's Response Regarding Violation G:

The licensee contends that this was a misunderstanding by the NRC inspector because he thought the "check-out and storage form" was being used as a utilization log. The licensee states that the storage utilization log would have been completed when the radiographer's shift was completed.

NRC Evaluation of Licensee's Response Regarding Violation G:

10 CFR 34.27 requires that a log be maintained current where devices are used. The purpose of the log is defeated if entries are made when use of the device is complete and the device is returned to the storage location. The storage utilization log is intended to record the location of the exposure devices when they are in the field. The NRC inspector verified, while reviewing the form, that a device had been removed from storage and the storage utilization log was not completed to reflect this removal. Therefore, the violation remains as proposed.

Restatement of Violation H:

10 CFR 20.408(b) requires that a report be sent to the NRC of an individual's exposure to radiation when he terminates employment.

Contrary to the above, since April 5, 1984, four individuals terminated employment, but as of October 19, 1984, termination reports were not provided to the NRC.

Summary of Licensee's Response Regarding Violation H:

The licensee acknowledges this violation.

NRC Evaluation of Licensee's Response Regarding Violation H:

No evaluation required.

Restatement of Violation I:

Condition 17 of License No. 37-23370-01 requires that licensed material be possessed and used in accordance with statements, representations, and procedures contained in the application dated January 31, 1984, and letters dated March 22, 1984 and May 4, 1984.

Item 5.3.3 on page 5.2 of the application dated January 31, 1984, requires that a person hired with radiographer credentials from another company complete a practical performance examination before being assigned to perform radiography.

Contrary to the above, as of January 11, 1985, a person hired with radiographer credentials from another company did not complete a practical performance examination before being assigned to perform radiography.

Summary of Licensee's Response Regarding Violation I:

The licensee does not deny this violation.

NRC Evaluation of Licensee's Response Regarding Violation I:

No evaluation required.

Restatement of Violation J:

10 CFR 34.22(a) requires that, during radiography operations, the sealed source assembly be secured in the shielded position each time the source is returned to that position.

Contrary to the above, on January 16, 1985, a radiographer performed a number of radiographic exposures and cranked the source from the end of the guide tube to the shielded position in the exposure device each time, but did not secure the source between each exposure.

Summary of Licensee's Response Regarding Violation J:

The licensee stated "...we do not consider 'secure' to having the same meaning as 'lock'. Otherwise, why would both words be used in paragraph 10 CFR 34.22(a) & (b) if one word meant the same as both." The licensee stated that the radiographer properly surveyed his camera to assure that the source was in the secured position and the camera was under his constant surveillance at all times.

NRC Evaluation of Licensee's Response Regarding Violation J:

The requirement in 10 CFR 34.22 to secure the source assembly in the shielded position each time means that the licensee must do more than merely retract the source to the shielded position and keep it under observation. Some positive action is required to prevent the inadvertent release of the source from the shielded position if the device or crank is moved. For most radiographic sources this may indeed mean using the locking device on the source. But the requirement to secure it after each exposure is separate from the requirement to keep the source locked if it is not under direct surveillance. In this case the device was not locked or otherwise positively secured between exposures and the violation remains as proposed.

Summary of Licensee's Response to Proposed Imposition of Civil Penalties:

The licensee maintains that the civil penalty should be withdrawn due to its financial condition. It claims to have been in business only a short time (approximately 16 months) and to have been undercapitalized from the outset. At the request of NRC Region I, the licensee submitted financial statements in support of this position indicating that it has a substantial accumulated debt. It further maintains that this civil penalty, when coupled with current tax liabilities and operating costs, will force the company to file for protection under the Federal Bankruptcy Laws, Chapter 11.

NRC Evaluation of Licensee's Response to Proposed Imposition of Civil Penalties:

The Enforcement Policy makes clear that it is not the intent of a civil penalty to put a licensee out of business or adversely affect a licensee's ability to safely conduct licensed operations. The assessment of a civil penalty should take into account a licensee's ability to pay. However, after the staff analysis of the financial statement submitted with the licensee's letter of April 10, 1985, the NRC is not convinced that civil penalties of the magnitude proposed (\$5,000) will put this licensee out of business. Although it is conceded that the company may have a cash flow problem, the licensee's net sales for the last nine months of CY 1984 should enable the licensee to pay the civil penalty and to safely conduct licensed operations. This is especially true since much of the company's debt is owed to either its majority or minority stockholders.

NRC Conclusion:

The licensee's response does not justify withdrawal of any of the violations, or reducing the severity level of the violations. Accordingly, civil penalties of Five Thousand Dollars are imposed.

ATTACHMENT 6



NORTH AMERICAN INSPECTION, INC. START: _____

P.O. BOX 88
LAURYS STATION, PA. 18059

FINISH: _____

RADIOGRAPHER EXAMINATION
"TEST NO. 1 - N.R.C."

Regraded
by Don ESO
10-1-85
72%
70%
-14

NAME: Donna Frack GRADE: 70% DATE: 4-19-84
EXAMINER: Robert J. Hummer SNT-TC-1A LEVEL III

- X. What is the generally accepted mid-lethal dose for an acute exposure (short time) to the whole body?

2 MR / hr. 450 REM

2. If the radiation intensity is 160 MR/HR at 15 feet from an Iridium 192 source, what is the intensity at 30 feet?

40 MR/hr

3. A Radiographer is limited to what permissible dose in a calendar quarter if he does not have an established radiation exposure history?

1.25

4. A Radiographer is limited to what maximum permissible dose in a calendar quarter if he has an established radiation exposure history which confirms that the Radiographer's lifetime accumulated dose is less than 5 REMS each year of age over 18 years?

3

5. The most biological damage for a given dose of radiation occurs when the exposure is to? (Circle one)

a. FEET AND ANKLES
☒ c. WHOLE BODY
e. HANDS AND FOREARMS

b. SKIN
d. GONADS

6. Iridium 192 has a half life of 75 days. If an Iridium 192 source is 100 Ci on March 1, 1980, what is its activity on August 1, 1980?

25 curies



NORTH AMERICAN INSPECTION, INC.

P.O. BOX 88
LAURYS STATION, PA. 18059

RADIOGRAPHER EXAMINATION (CONTINUED)

7. If a source tag on a radiography camera specified that the source assembly was Co-60 with an activity of 50 Ci on May 15, 1980, when is the earliest date that a leak test would be due?

Nov. 15, 1980

8. The radiation intensity at a certain point from an exposed radiography source without a collimator is 800 MR/HR, how many HVL (half-value layers) of shielding would be required in a collimator to reduce the radiation intensity to 25 MR/HR except in the direction of the direct beam?

5

9. A permanent sterility dose of radiation is? (Circle one)

- a. ABOUT EQUAL TO A MID-LETHAL DOSE.
- b. LESS THAN A MID-LETHAL DOSE.
- ☒ c. GREATER THAN A MID-LETHAL DOSE.
- d. ABOUT EQUAL TO BACKGROUND RADIATION.
- e. NONE OF THE ABOVE.

10. If an individual enters a "HIGH RADIATION AREA" for one (1) hour, he is likely to receive at least what dose?

100 mR

11. If an individual enters a "RADIATION AREA" for one (1) hour, he is likely to receive at least what dose?

5 mR

12. In an "UNRESTRICTED AREA" an individual remaining for one (1) hour will never receive more than what dose?

2 mR

- ☒ 13. Distinguish between "radiation dose rate" and "radiation dose".

radiation dose rate - what you are allowed to pick up.
radiation dose - what you pick up.



NORTH AMERICAN INSPECTION, INC.

P.O. BOX 88
LAURYS STATION, PA. 18059

RADIOGRAPHER EXAMINATION (CONTINUED)

14. If Iridium 192 gives a dose rate of 5.9 R/HR/Ci @ 1 foot from a radiography source capsule, then what is the radiation intensity at 10 feet from a 100 Ci Iridium 192 source?

5.9 ml

15. The principle hazard in industrial radiography results from? (Circle one)

a. COSMIC RAYS
c. ALPHA AND BETA PARTICLES
e. SURFACE CONTAMINATION
b. INTERNAL CONTAMINATION
d. EXTERNAL RADIATION

16. A radiography survey meter must be capable of detecting radiation levels from 2 MR/HR to at least 1 R/HR.

X. Define half-life of an isotope. The amount that the source is in the camera before it gets changed.

18. Define half-value layer. The thickness of material required to reduce the amount of radiation by half

19. The energy of radiation emitted from an isotope is usually given in the terms of? (Circle one)

a. CURIE
c. RBE
e. MICRON
b. REM
d. ELECTRON VOLTS (MEV &/or KEV)

X. Define a Curie. the amount of radiation given off from the source during exposure.



NORTH AMERICAN INSPECTION, INC.

P.O. BOX 88
LAURYS STATION, PA. 18059

RADIOGRAPHER EXAMINATION (CONTINUED)

21. When a darkroom is used at a job site as a storage area for radiography cameras, how should it be identified or posted?

A radioactive material sign should be posted on the truck.

- ☒ 22. When a radiography camera is transported inside of a darkroom on the back of a pickup truck, how is it posted?

radioactive material

23. List three (3) records required by the regulations which must be completed daily during radiographic operations.

Camera Survey

Dosimeter reading

Truck surveys

- ☒ 24. Explain how radiation intensity is related to the distance from a point source of radiation.

25. A survey meter used for radiography operations must be calibrated how frequently?

every 3 months

- ☒ 26. Should a Radiographer make a physical survey of a "HIGH RADIATION AREA" to determine where to post signs? Explain.

Yes. To determine the safe and proper area to place radiation signs.



NORTH AMERICAN INSPECTION, INC.

P.O. BOX 88
LAURYS STATION, PA. 18059

RADIOGRAPHER EXAMINATION (CONTINUED)

27. Describe the required information and identification which must be on each radiography camera.

Camera name (Gama End Techop, etc.)
serial number - serial number of camera
leak test date - the date that the next
leak test is due. How many curies contained

28. Define a Roentgen. The amount of gamma or
X-rays required to produce ions carrying
1 electrical charge in one cubic
centimeter of dry air.

29. What information is required on the utilization log?

Date, Customer, Time, Job Location,
camera number & isotope number & curies

- 1/2 30. Describe how to determine that the source assembly is safely
back in the camera after an exposure.

check survey meter.



NORTH AMERICAN INSPECTION, INC.

P.O. BOX 88
LAURYS STATION, PA. 18059

RADIOGRAPHER EXAMINATION (CONTINUED)

31. If the intensity from a radiography source is 80 MR/HR at 30 feet from the source, at what distance will the radiation intensity be 20 MR/HR?

60

- 1/2 32. What is the purpose of a leak test?

To make sure that no radioactive material is being released.

33. Specify two (2) personnel monitoring devices which must be worn by radiography personnel at a job site.

Film badge, dosimeter.

34. What is the minimum range required for a pocket dosimeter?

0-200

- X 35. For the average person, what minimum acute whole body radiation exposure is usually required before easily perceptible clinical symptoms are noted?

- 1/2 36. When must the source assembly be locked in the radiography camera?

during non-exposure time.

37. What means should be used to maintain control over a "RESTRICTED RADIOGRAPHY AREA"?

Putting up signs or ropes and watching the area.



NORTH AMERICAN INSPECTION, INC.

P.O. BOX 88
LAURYS STATION, PA. 18059

RADIOGRAPHER EXAMINATION (CONTINUED)

38. Is it permissible to recharge a pocket dosimeter during radiographic operations and continue work? Explain.

1/2

No. It is to be zeroed when starting each day and read at the end of work day and then rezeroed next day.

39. When you discover that your pocket dosimeter has "gone-off" scale during radiographic operations what action do you take?

1/2

call your RSO.

40. Define "Agreement State". A state that agrees to let you come in and do the radiation work.

41. A Radiographer is on a very repetitive job where he is picking up 50 MREM everyday, five (5) days a week. Is this permissible? Explain.

X

No, because you are allowed only 100 mR / week.

42. You discover that you cannot crank in your source after an exposure, but you know that you can disassemble the crank-out and return the source to the camera. What do you do?

rope off area and call your RSO.



NORTH AMERICAN INSPECTION, INC.

P.O. BOX 88
LAURYS STATION, PA. 18059

RADIOGRAPHER EXAMINATION (CONTINUED)

43. What is the purpose of a collimator? To decrease
the amount of radiation given off.

44. If the half-value layer of steel is 0.5 inches and you are radiographing a vessel with 1.5 inch steel walls, what is the radiation intensity at a point where you have calculated the unattenuated intensity to be 40 M.EM/HR?

5

$\frac{1}{2}$ 45. After completing an exposure, surveying and locking the camera, disconnecting the controls and source tube, you drop the camera off a thirty (30) foot pipe rack. What action do you take?

call your RSO.

46. An individual frequenting a "RADIATION AREA" during the entire time it is established over a period of five (5) days, is likely to receive at least what dose?

100

47. An individual continuously present in an "UNRESTRICTED AREA" for one (1) week will never receive more than what dose?

100



NORTH AMERICAN INSPECTION, INC.

P.O. BOX 88
LAURYS STATION, PA. 18059

RADIOGRAPHER EXAMINATION (CONTINUED)

48. If a Radiographer becomes incapacitated and leaves the job site, may an Assistant Radiographer complete the days work? Explain.

1/2

No. because he is not a qualified Level III
He must have the radiographer present
at all times.

49. During an exposure, what should radiography personnel be doing?

Watching the radiation area.

50. Describe the security requirements for leaving a radiography device unattended.

1/2

Lock the camera and disconnect guide
tube and crank cable. Survey camera to
make sure source is in and everything is safe.



NORTH AMERICAN INSPECTION, INC.

START: _____

P.O. BOX 88
LAURYS STATION, PA. 18059

FINISH: _____

RADIOGRAPHY PROCEDURAL EXAMINATION

"RADIOGRAPHIC PROCEDURES"

Re-graded by [signature] LSO 10-11-85
5/1
-7

NAME: Danna Frack GRADE: 7270 DATE: 4-19-84
EXAMINER: [signature] SNT-TC-1A - LEVEL III

1. What personnel monitoring devices must you have on you at a radiography site? Specify minimum range(s), if any.

film badge, dosimeter

2. What action are you required to take if you discover that your pocket dosimeter is off scale at the conclusion of a radiographic exposure? ① Stop work ② Call LSO ③ Submit badge for processing

2/3
call your Radiation Safety Officer

3. Describe what you would do if you were the radiographer at a field site and your survey meter went off scale when you approached the camera after cranking in the source.

get back from source and contact your RSO

4. List five (5) items to be inspected prior to using radiography equipment each day.

2/5
Xcalibration of survey meter survey of camera
crank cable
guide tube

5. A. How would you check a survey meter for proper operation?

turn on battery check and then to 1 or 10
then survey the source - FOR NORMAL READING

- B. How frequently must radiography meters be calibrated?

every 3 month



NORTH AMERICAN INSPECTION, INC.

P.O. BOX 88
LAURYS STATION, PA. 18059

RADIOGRAPHY PROCEDURAL EXAMINATION (CONTINUED)

6. What action must be taken if a survey meter reads zero at the outlet nipple when performing the initial survey prior to making an exposure?

Check on battery Check and then call
RSO.

7. When it is permissible to leave a radiographic site during an exposure?

Never

- X. A. How do you determine where to post "RADIATION AREA" signs prior to making the first exposure?

A safe area where radiation exists that
exceeds 5mR in an hour

By calculations or it may be looked up on a table - using
the estimated hourly work load

- B. During the exposure?

figure ^{Physical Survey} how long the shot is by how many
curies and what a safe distance would be for less than
2 mR an hour.

- X. A. During the daily routine of making several radiography exposures when must the camera be surveyed?

before arriving at job site before the 1st shot
and before leaving job site, and after each
exposure.

- B. What records are made of the survey?

A record in MCHC is retained of the last
source security survey of the day



NORTH AMERICAN INSPECTION, INC.

P.O. BOX 88
LAURYS STATION, PA. 18059

RADIOGRAPHY PROCEDURAL EXAMINATION (CONTINUED)

10. What sign or label is required to be legible on every loaded radiography camera?

Radioactive Material

11. List the information contained in the utilization log.

Date, Customer, Time, Job Location, camera number
and Isotope number, amount of curies

12. When transporting a radiography camera where should a survey meter be located?

in front of the truck

13. When should pocket dosimeter readings be recorded?

daily (at the end of work day)

14. Define "RESTRICTED AREA". an area that no-one

but required personnel may enter (meaning qualified
radiographer.)

15. Define "RADIATION AREA". The area where radiation

exists but does not exceed 5 mR/hr.
or 100 mR in 5 days

16. Define "HIGH RADIATION AREA". The area more than

5 mR/hr. 100 mR in 1 hour

17. List three (3) records to be generated and maintained by radiography personnel at a job site.

1) radiographic report 3) transportation log
2) utilization log



NORTH AMERICAN INSPECTION, INC.

P.O. BOX 88
LAURYS STATION, PA. 18059

RADIOGRAPHY PROCEDURAL EXAMINATION (CONTINUED)

18. What is the maximum radiation level permitted for a small hand held Iridium 192 radiography camera?

100 curies 50 MR @ 6"

19. How frequently must radiography sources be leak tested?

every 6 months

20. During an exposure you observe that an individual has just entered the defined "RESTRICTED AREA". What action should you take?

Crank source off immediately.

21. Define Radiographer. Qualified personnel who can operate a source. A responsible individual at a job site who assures compliance with NRC Regs & NAI OVE

22. Define Assistant Radiographer. Assists the radiographer and runs the darkroom. May operate radiographic devices & perform surveys under direct supervision of a radiographer

23. If a Radiographer becomes incapacitated and leaves the job site, may an assistant radiographer complete the days work? Explain steps to be taken.

No, unless they are a Level II.

24. During an exposure, what should radiography personnel be doing?

Watching the area that no unauthorized person goes beyond signs & be timing the shot,



NORTH AMERICAN INSPECTION, INC.

P.O. BOX 88
LAURYS STATION, PA. 18059

RADIOGRAPHY PROCEDURAL EXAMINATION (CONTINUED)

25. Describe the security requirements for leaving a radiography device unattended.

Lock the camera, disconnect guide tube
and crank cable.

ATTACHMENT 7

DAILY RADIATION SURVEY REPORT

Page 35
Form RS-4-4 (Rev. 0)
(1-84)

RADIOGRAPHER Kerry M. Frack JOB LOCATION Both Steel-Both PA

DATE Oct. 18, 1984 TIME 7:30 AM PROJECT Cooling stacks

1. SOURCE OF RADIATION: IR-192 S/N CO-60 S/N 1877, X-RAY S/N
2. CURIES: 93 X-5 KV-MA MAXIMUM: 100
3. SURVEY METER NO. 31343 CALIBRATION DUE DATE 10-25-84
4. CAMPA MODEL NO. Campan MANUFACTURER Cam na Pad S/N 10050
5. DAILY EQUIPMENT CHECK PERFORMED? (Form No. RS-4-3) EQUIPMENT ACCEPTABLE? YES ✓ NO ✓
6. RADIOGRAPHER DOSIMETER S/N 1081881 DATE CALIBRATION DUE 4-19-85
7. ASST. RADIOGRAPHER DOSIMETER S/N 4040721 DATE CALIBRATION DUE 4-19-85
8. RADIOGRAPHER FILM BADGE S/N 00012 ASST. RADIOGRAPHER FILM BADGE NO. 00022
9. SOURCE DECAY CURVE IN LOG BOOK? YES ✓ NO ✓
10. SOURCE TRANSPORTATION DOCUMENTS IN LOG BOOK? YES ✓ NO ✓
11. RADIOGRAPHY MANUAL S/N 25, 3 OR MORE RADIATION SIGNS IN LAB/SITE? YES ✓ NO ✓
12. DOSIMETER RECORD RECEIVED: RADIOGRAPHER: (START 0 MR FINISH 70 MR) KMF
ASSISTANT RADIOGRAPHER: (START 0 MR FINISH 70 MR) BS.
13. TOTAL EXPOSURE TIME FOR SHIFT/DAY: 1 HOURS, 45 MINUTES
14. PERSONNEL NOTIFIED OF RADIATION AREAS, WHERE APPLICABLE? YES ✓ NO ✓
15. CONSTANT SURVEILLANCE? YES ✓ NO ✓ DID YOU USE ROPES? YES ✓ NO ✓
DID YOU USE SIGNS? YES ✓ NO ✓ WAS A COLLIMATOR USED? YES ✓ NO ✓
16. RECORD OF PHYSICAL SURVEY MADE TO DETERMINE SOURCE IS IN SHIELDED POSITION PRIOR TO SECURING EXPOSURE DEVICE yes

- a. IRIIDIUM 192 55 MR/HR AT 6 INCHES FROM SURFACE. ON CONTACT 55 MR/HR
- b. COBALT 60 55 MR/HR AT SURFACE OF EXPOSURE DEVICE.

16. VEHICLE STORAGE SURVEY:

- 1a. LEAVE: 62 MR/HR AT DRIVER, 62 MR/HR AT OUTSIDE SURFACE, 62 MR/HR AT 1 FT. FROM SURFACE
- 1b. RETURN: 62 MR/HR AT DRIVER, 62 MR/HR AT OUTSIDE SURFACE, 62 MR/HR AT 1 FT. FROM SURFACE

EXPOSURE AREA A, B, OR C AS MAY BE APPLICABLE, WHERE MORE THAN ONE (1) EXPOSURE CONDITION EXISTS PER WORK SHIFT, RECORD IN EXPOSURE AREA A, B, OR C:

RESULT OF PHYSICAL SURVEY

BARRICADE EQUIPMENT

☒ SIGNS ☐ NOPE

☒ CONSTANT SURVEILLANCE

☒ collimator

RESULT OF PHYSICAL SURVEY

BARRICADE EQUIPMENT

☐ SIGNS ☐ NOPE

☐ CONSTANT SURVEILLANCE

☐ collimator

RESULT OF PHYSICAL SURVEY

BARRICADE EQUIPMENT

☐ SIGNS ☐ NOPE

☐ CONSTANT SURVEILLANCE

☐ collimator

Kerry M. Frack

Kenneth Frack
Bryan Shumway

NAME OF ASST. RADIOGRAPHER (if applicable)



NORTH AMERICAN INSPECTION, INC.

P.O. BOX 88
LAURYS STATION, PA. 18059

Page 37

FORM RS-4-6

Rev. 0 (1-84)

"UTILIZATION LOG"

1. NAME Kerry M. Frack S.S. NO. 183-46-1950 DATE 10-18-84
2. TYPE SOURCE Co⁶⁰ CAMERA MODEL & S/N Cornatron 100A #100-91
SOURCE S/N & CURIES 1877 98 curies
3. JOB SITES EXPOSURE LOCATION (CITY AND AREA) Bethlehem Steel
Beth. PA
4. MAXIMUM RADIATION LEVEL AT PERIMETER OF RESTRICTED AREA 2 MR/HR
5. RADIATION LEVEL AT 6 INCHES FROM SURFACE OF DEVICE 20 MR/HR
(When securing prior to vehicle storage)
6. RADIATION LEVEL ON SURFACE OF VEHICLE STORAGE CONTAINER 55 MR/HR
7. RESULTS OF DAILY INSPECTION O.K.
8. SURVEY METER NO. 31303 CALIBRATION DUE DATE 10-25-84
9. LEAK TEST DUE DATE 3-24-85 QUARTERLY INVENTORY DUE DATE 10-20-84
10. QUARTERLY INSPECTION DUE DATE 10-25-84 TOTAL EXPOSURE TIME 74A 45min
11. TOTAL NUMBER OF EXPOSURES 30 FILM BADGE NUMBER 00004
12. RADIATION REPORT COMPLETED (☒ YES OR NO) CAPS ON SOURCE TUBE —
13. SUPPLEMENTAL LOG COMPLETED (YES OR ☒ NO) VEHICLE SURVEYED yes
14. DOSIMETER REPORT COMPLETED (☒ YES OR NO)
15. DOSIMETER SERIAL NUMBERS 4040723 4040721, 1081881
16. FINAL STORAGE RESULTS (MR/HR) 55
17. COMMENTS

Bryan Shumway operated source under my
supervision.

Kerry M. Frack
RADIOGRAPHERS SIGNATURE

North American Inspection, Inc.

EMPLOYEE DAILY TIME SHEET

ME: LAST FIRST MIDDLE			DIVISION	EMPLOYEE, DEPT. NO.		WEEK ENDING:				
FRACK KERRY M.			LAURY'S STATION			MONTH Oct. DAY 20 1984				
DATE	CUSTOMER/JOB NO.	WORK LOCATION (CITY, STATE)	NDE NO.	VEHICLE NO.	HOURS WORKED		SUBSISTENCE	PERSONAL MILEAGE	CASH TICKETS	APPROVED CHECKED BY
					ST	OT				
JNDAY 10-14-84	off	Bethlehem PA								
ONDAY 10-15-84	Bethlehem Steel (Cooling)	Bethlehem PA		U-10	10					
	Songer - test plates	Bethlehem, PA			2					
	Bethlehem Steel	Bethlehem PA			8					
JESDAY 10-16-84	Bethlehem Steel	Beth. PA		U-10	10					
	shop - (change chemicals)	Laury's Station			1					
WEDNESDAY 10-17-84	Bethlehem Steel	Beth. PA.		U-10	10					
	Roxa + Saus	Beth PA.			4					
	Bethlehem Steel	Beth PA.			11					
THURSDAY 10-18-84	Bethlehem Steel	Beth. PA		U-10	10					
FRIDAY 10-19-84	Bethlehem Steel	Beth. PA		U-10	10					
	Bethlehem Steel	Beth. PA			5					
TURSDAY 10-20-84										

For Office Use Only

SUMMARY 40 41

TOTAL STRAIGHT TIME 40
TOTAL OVERTIME 41
TOTAL HOURS

[Signature]

TOTAL CASH TICKETS (3)
TOTAL SUBSISTENCE (4)
TOTAL MILEAGE (5)

Pay Period Ending: _____
Total Advances (6)

ATTACHMENT 8

DAILY RADIATION SURVEY REPORT

Page 35

Form RS-4-4 (Rev. 0)
(1-84)

RADIOGRAPHER Kerry - Mr. Frack JOB LOCATION LAURY'S STATION
DATE OCT 4, 1984 TIME 8:00 PM PROJECT Songer Weld Test Plate

SOURCE OF RADIATION: IR-192 ☒ S/N 16104, CO-60 ☐ S/N , X-RAY ☐ S/N
CURIES: 110 X-RAY KV-MA MAXIMUM:
SURVEY METER NO. 31299 CALIBRATION DUE DATE 11-15-84
CAMERA MODEL NO. Century 5 MANUFACTURER GAMA Inc. S/N 2731
DAILY EQUIPMENT CHECK PERFORMED? (Form No. RS-4-3) EQUIPMENT ACCEPTABLE? YES ☒ NO ☐
RADIOGRAPHER DOSIMETER S/N 4040723 DATE CALIBRATION DUE 4-19-85
ASST. RADIOGRAPHER DOSIMETER S/N DATE CALIBRATION DUE
RADIOGRAPHER FILM BADGE S/N 00004 ASST. RADIOGRAPHER FILM BADGE NO.
SOURCE DECAY CURVE IN LOG BOOK? YES ☒ NO ☐
SOURCE TRANSPORTATION DOCUMENTS IN LOG BOOK? YES ☒ NO ☐
RADIOGRAPHY MANUAL S/N #3, 3 OR MORE RADIATION SIGNS IN LAB/SITE? YES ☒ NO ☐
DOSIMETER RECORD RECEIVED: RADIOGRAPHER: (START 0 MR FINISH 0 MR) Mr. Frack
ASSISTANT RADIOGRAPHER: (START 0 MR FINISH MR)

TOTAL EXPOSURE TIME FOR SHIFT/DAY: 0 HOURS, 5 MINUTES
PERSONNEL NOTIFIED OF RADIATION AREAS, WHERE APPLICABLE? YES ☒ NO ☐
CONSTANT SURVEILLANCE? YES ☒ NO ☐ DID YOU USE ROPES? YES ☐ NO ☒
DID YOU USE SIGNS? YES ☒ NO ☐ WAS A COLLIMATOR USED? YES ☒ NO ☐
RECORD OF PHYSICAL SURVEY MADE TO DETERMINE SOURCE IS IN SHIELDED POSITION PRIOR TO SECURING EXPOSURE DEVICE yes

a. IRIDIUM 192 25 MR/HR AT 6 INCHES FROM SURFACE. ON CONTACT 100 MR/HR
b. COBALT 60 MR/HR AT SURFACE OF EXPOSURE DEVICE.

VEHICLE STORAGE SURVEY:

a. LEAVE: 2 MR/HR AT DRIVER, 2 MR/HR AT OUTSIDE SURFACE, 2 MR/HR AT 1 FT. FROM SURFACE
b. RETURN: 2 MR/HR AT DRIVER, 2 MR/HR AT OUTSIDE SURFACE, 2 MR/HR AT 1 FT. FROM SURFACE

EXPOSURE AREA A, B, OR C AS MAY BE APPLICABLE, WHERE MORE THAN ONE (1) EXPOSURE CONDITION EXISTS PER WORK SHIFT, RECORD IN EXPOSURE AREA A, B, OR C:

RESULT OF PHYSICAL SURVEY

ARRICADE EQUIPMENT
☐ SIGNS ☐ ROPE
☐ CONSTANT SURVEILLANCE
Tungson
collimator

RESULT OF PHYSICAL SURVEY

ARRICADE EQUIPMENT
☐ SIGNS ☐ ROPE
☐ CONSTANT SURVEILLANCE

RESULT OF PHYSICAL SURVEY

ARRICADE EQUIPMENT
☐ SIGNS ☐ ROPE
☐ CONSTANT SURVEILLANCE

SIGNATURE OF RADIOGRAPHER Kerry M. Frack NAME OF ASST. RADIOGRAPHER (if applicable)



NORTH AMERICAN INSPECTION, INC.

P.O. BOX 88
LAURYS STATION, PA. 18059

Page 37

FORM RS-4-6

Rev. 0 (1-84)

"UTILIZATION LOG"

1. NAME KERRY M. FRACK S.S. NO. 183461950 DATE 10-4-84
2. TYPE SOURCE IR-192 CAMERA MODEL & S/N Century S 2731
SOURCE S/N & CURIES 26.104 110
3. JOB SITES EXPOSURE LOCATION (CITY AND AREA) Songer
shop
4. MAXIMUM RADIATION LEVEL AT PERIMETER OF RESTRICTED AREA 2 MR/HR
5. RADIATION LEVEL AT 6 INCHES FROM SURFACE OF DEVICE 25 MR/HR
(When securing prior to vehicle storage)
6. RADIATION LEVEL ON SURFACE OF VEHICLE STORAGE CONTAINER 20 MR/HR
7. RESULTS OF DAILY INSPECTION OK
8. SURVEY METER NO. 31299 CALIBRATION DUE DATE 11-15-84
9. LEAK TEST DUE DATE 4-3-85 QUARTERLY INVENTORY DUE DATE 10-19-84
10. QUARTERLY INSPECTION DUE DATE 12-4-84 TOTAL EXPOSURE TIME 5 min
11. TOTAL NUMBER OF EXPOSURES 1 FILM BADGE NUMBER 00004
12. RADIATION REPORT COMPLETED (YES OR NO) YES CAPS ON SOURCE TUBE YES
13. SUPPLEMENTAL LOG COMPLETED (YES OR NO) NO VEHICLE SURVEYED yes
14. DOSIMETER REPORT COMPLETED (YES OR NO) YES
15. DOSIMETER SERIAL NUMBERS 4040723
16. FINAL STORAGE RESULTS (MR/HR) 20
17. COMMENTS _____

Kerry M. Frack

RADIOGRAPHERS SIGNATURE

February 8, 1985

North American Inspection, Inc.

SUBJECT: Reprimand - Kerry M. Frack, S.S.#183-46-1950

CAUSE: Violation of adhering to radiation reporting as required by N.A.I.I.'s R.S.O. Manual part IV.

JUSTIFICATION: In accordance with Employee Policy Manual, page 21, paragraph J.

Kerry Frack (Radiographer) is herewith suspended from active employment with N.A.I.I. for a period of three (3) days without pay for reasons of non-compliance of rules and regulations that are a part of his job duties. Another violation concerning the like of reporting correct data as required by N.A.I.I.'s Radiation Safety Program will result in immediate termination of employment from N.A.I.I.



Joel E. Guthrie
Operations Manager

A Statement of Understanding:

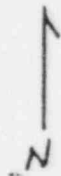
I, Kerry Frack, have been interviewed and understand the seriousness of my mistake contained in certain radiation reports, and herewith state that I have a more comprehensive understanding of the seriousness of my acts as it relates to the well-being of my employer. I further admit my negligence constitutes discipline as defined in my Employee Policy Manual.

Signed: Kerry M. Frack Witness: Sm Hojinski

CC: R.K. Shumway
Kerry M. Frack
R.S.O. Personnel File

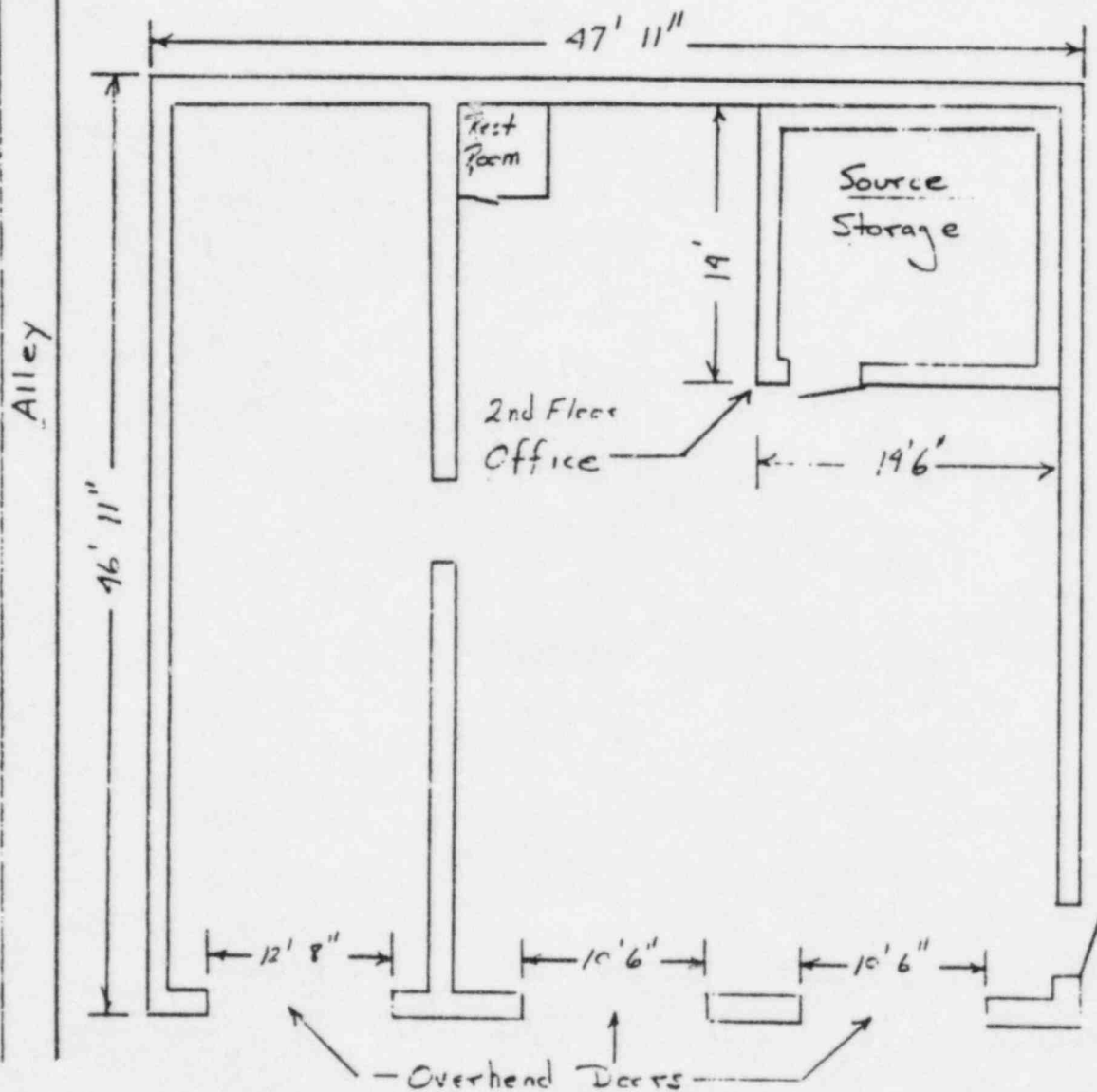
ATTACHMENT 9

Sunrise Road



Building 1 - Warehouse, Laboratory
Work Area and Shop Office

First Floor



Revision 0
January 1984

Drawing 1P
1-3

NORTH AMERICAN INSPECTION, INC.
3906 Main Street
Laureys Station, Pennsylvania 18058

SUNRISE RD.

EAST →

NORTH →

RT. 145

PROPERTY LINE

255'

130'

96'

76'

44'

38'

59'

P

P

P

P

2

1

3

4

1. WAREHOUSE, LABORATORY WORK AREA & SHOP OFFICE.
2. GARAGE
3. CORPORATE OFFICES
4. RESTAURANT

P = PARKING

Revision 0
January 1984

Drawing 1A
1-2

ATTACHMENT 10



UNITED STATES NUCLEAR REGULATORY COMMISSION

OFFICE OF PUBLIC AFFAIRS, REGION I
631 Park Avenue, King of Prussia, Pa. 19406
Tel. 215 337-5330

No. I-85-24
Contact: Karl Abraham
Brian Norris

February 19, 1985

NRC STAFF CITES LAURYS STATION, PA COMPANY FOR ALLEGED VIOLATIONS OF FEDERAL REQUIREMENTS FOR RADIOGRAPHY; PROPOSES \$5,000 FINE

The staff of the Nuclear Regulatory Commission (NRC) has cited North American Inspection, Inc. of Laurys Station, PA for 12 alleged violations of federal regulations covering the use of radioactive materials in industrial radiography. The NRC staff proposes to fine the company \$5,000.

The alleged violations were discovered during NRC inspections of the company's facility in Laurys Station, and of temporary job sites in Bethlehem, PA and Lebanon, NJ, where North American Inspection, Inc. was performing radiographic operations. The inspections were conducted on October 18 and 19, 1984 and January 11 and 16, 1985.

North American Inspection, Inc. is licensed by the Nuclear Regulatory Commission to use certain radioactive materials in doing industrial radiography, such as taking x-ray-like pictures of welded seams in pipelines and various industrial products, to determine if there are defects in the welds.

Two of the alleged violations involved the failure by the company to control radiation levels in unrestricted areas near the places where radiography was being performed. Within the unrestricted area adjacent to the company's Laurys Station facility is a restaurant. The company has told the NRC staff that the restaurant had been closed whenever radiography was being done. There was a similar area with a building in it at the Bethlehem work site.

Federal regulations require that radiation levels in unrestricted areas be limited so that an individual, who if continuously present in the area, would not receive a radiation exposure in excess of 2 millirem in any one hour, or more than 100 millirem in any seven consecutive days. A millirem is a measure of radiation exposure. A person living in the U.S. receives a yearly radiation exposure of about 100 millirem from naturally occurring radiation.

The alleged violation at the company's Laurys Station plant was discovered when the NRC inspector was reviewing the company's records. The alleged higher-than-allowed radiation level occurred on October 4, 1984 when the company was doing equipment tests. The company said it only did these tests at times when there were no people in the unrestricted area and, consequently, no exposures of people occurred. NRC analysis of the circumstances has determined that even if there had been people in the unrestricted area during the tests, the maximum exposure of such a person would have been only 11 millirem during a two-hour period. This small amount of exposure would not be expected to affect their health. Higher-than-allowed radiation levels in the unrestricted area around the company's office may have occurred on occasions other than on October 4, 1984. However, calculations by the NRC indicate the total dose to any individual, who would have been present in the unrestricted area throughout all equipment tests at the company's facility, would have been less than 70 millirem. This small dose also would not be considered a health problem.

The alleged higher than permitted radiation level in the unrestricted area in Bethlehem was actually measured by the NRC inspector. This situation also involved no exposures to any member of the public.

Other alleged violations for which North American Inspection is being cited include permitting improperly trained or improperly certified employees to do radiography; failing to control access to high radiation areas; failing to have federally-required radiation warning alarms and lights at its facility in Laurys Station; failing to properly label radiographic equipment and vehicles transporting the equipment with radiation warning signs; failing to secure radiographic equipment being transported by vehicle; failing to do radiation surveys after performing radiography; failing to maintain adequate records of radiography operations; failing to notify the NRC of employees leaving the company; and failing to follow correct procedures when doing radiography work.

The NRC does not believe that any person will suffer adverse health affects as a result of any of these alleged violations.

In a letter informing the company of this proposed enforcement action, Dr. Thomas E. Murley, Regional Administrator, NRC Region I, said, "These twelve violations...are of significant concern because they collectively indicate that adequate oversight and control of the radiation safety program was not exercised. These violations demonstrate the need for improvements in management control over licensed activities to assure adherence to NRC requirements and the safe performance of work."

The company has 30 days to either pay the fine or to request in writing that part or all of it be withdrawn. The company also has 30 days to write to the NRC and describe what was done or will be done to assure that these alleged violations do not recur.

The Commonwealth of Pennsylvania has been informed of this proposed enforcement action.

ATTACHMENT 11



- b. Radiation Area Surveys - During each exposure check the radiation level at the operator position by observing the survey meter near you and time permitting survey the radiation levels at the perimeter of the Restricted Area and/or Radiation Area. Make adjustments in the barricade or location of signs. The radiation level may be determined from the appropriate table using the maximum estimated exposure time in one hour.

4.9 At End of Exposure

a. Crank-Out Device

- 1) Crank the source back into the camera as smoothly and rapidly as possible. Continue to hold the crank firmly to prevent the source from moving.
- 2) Approach the camera from the lock box side with a survey meter. Staying behind the camera, reach around and survey the camera at the outlet nipple and then survey the entire length of source tube. The reading at the outlet nipple should be the same noted just prior to making the exposure. Lock the pig-tail in the camera. If at any time while approaching the camera, higher than normal readings are encountered, only attempt to crank in the source as above. If this fails to decrease the high reading, follow the emergency procedures below.
- 3) If you are going to make another exposure in the same general area or nearby pipe joint, then it is not necessary to disconnect the control cable and source tube. If the camera must be transported to another location or returned to storage, then disconnect control cable and source tube, and replace the lock box protector cap and safety plug.

b. Pipeline Device/Self Contained Camera

- 1) Without Remote Control - Approach the camera with a survey meter in the hand that you will not be using to operate the camera. Stretching as far as possible to maintain the greatest distance between the torso of the body and the source, rotate the knurled knob at 180° shielding the source and retracting the red indicator pin.
- 2) With Remote Control - Operate the control to rotate the source wheel 180° shielding the source, and observe that the source position indicator shows that the source is properly shielded.
- 3) Vacuum Operated - Turn control valve to the OFF position and approach the camera with a survey meter.
- 4) Immediately survey the camera at the same spot prior to the exposure. If you get the same reading, lock the camera. If you cannot immediately obtain the original reading by rotating the knob a few degrees then follow the emergency procedure below.

ATTACHMENT 12

NORTH AMERICAN INSPECTION, INC.

P.O. BOX 88

LAURYS STATION, PA. 18059

FORM RS-4-6

Rev. 0 (1-84)

"UTILIZATION LOG"

NAME KERRY M. FRACK S.S. NO. 183461950 DATE 10-19-85TYPE SOURCE CO⁶⁰ CAMERA MODEL & S/N GAMMATION 100-A # 100-90SOURCE S/N & CURIES SN 1877 93ciJOB SITES EXPOSURE LOCATION (CITY AND AREA) Bethlehem, PABeth. SteelMAXIMUM RADIATION LEVEL AT PERIMETER OF RESTRICTED AREA N/A MR/HRRADIATION LEVEL AT 6 INCHES FROM SURFACE OF DEVICE N/A MR/HR
(When securing prior to vehicle storage)RADIATION LEVEL ON SURFACE OF VEHICLE STORAGE CONTAINER N/A MR/HRRESULTS OF DAILY INSPECTION N/ASURVEY METER NO. 31303 CALIBRATION DUE DATE 10-25-85LEAK TEST DUE DATE 3-24-85 QUARTERLY INVENTORY DUE DATE 10-20-85QUARTERLY INSPECTION DUE DATE 10-25-85 TOTAL EXPOSURE TIME N/ATOTAL NUMBER OF EXPOSURES 0 FILM BADGE NUMBER 00004RADIATION REPORT COMPLETED (YES OR NO) (YES) CAPS ON SOURCE TUBE _____SUPPLEMENTAL LOG COMPLETED (YES OR NO) N/A VEHICLE SURVEYED yesDOSIMETER REPORT COMPLETED (YES OR NO) (YES)DOSIMETER SERIAL NUMBERS 4040723 HandFINAL STORAGE RESULTS (MR/HR) 55 on SurfaceCOMMENTS Did not use sourceKerry M. Frack
RADIOGRAPHERS SIGNATURE



STORAGE FACILITY UTILIZATION LOG

separate utilization log will be maintained for sealed sources and their exposure devices (including x-ray machines, survey meter calibration devices) removed from the permanent storage facility. This log will remain at the storage cabinet and contains the following information:

Month-Year Removed	X-Ray Tube or Source and Camera No.	Removed By	Job Site/Location	Curies and Leak Test Due Date	Quarterly Insp. Due Date	Date Returned/By
2-8-84	#66.084 (Source) #2764 (cam.)	DMH	Greenwood N.Y.	78 2-17-85	11-30-84	DMH 10-8-84
0-6-84	#66.084 (Source) #2764 (cam.)	A.R. Matz.	Greenwood N.Y.	68ci 2-17-85	11-30-84	DMH 10-11-84 *
0-8-84	T/O 244 Century-S 2731	Kmf	Eagle, PA ^{Cal.} Gas	46ci 1-11-85	11-30-84	Kmf 10-11-84
0-8-84	2731	G.W.	Gardner-Beth Pa.	110 4-3-85	12-4-84	10-6-84 GW
0-6-84	2731 Century S	G.W.	Arroyo Mfg.	104 4-3-85	12-4-84	10-10-84 G.W.
0-11-84	2731	Kmf	Beth. Steel	104 4-3-85	12-4-84	10-11-84 G.W.
0-12-84	T/O 660 Century S 2731	G.W.	Cryo Chem	45 1-11-85	11-30-84	10-12-84 G.W.
10-15-84	2731	K. FRACK	Bethlehem Steel	103 4-3-85	12-4-84	10-18-84 (Kmf)
10-16-84	T.O. 660 Co 60	G.W.	Cryo Chem	45 1-11-85	11-30-84	10-19-84 G.W.
10-18-84	100-90	K. Frack	Beth. Steel	93 3-24-85	10-20-84	10-18-84 (Kmf)
10-18-84	2731	R.K. Shumway	Gardner/Bethlehem	95 4-3-85	12-4-84	10-19-84 G.W.
10-19-84	2731	K. FRACK	Beth. Steel	98 4-3-85	12-4-84	10-19-84 (Kmf)
10-19-84	Co/60 100-90	K. Frack	Bethlehem Steel	93 3-24-85	10-20-84	10-19-84 Tony Frack
10-20-84	T/O 660 Sec. # 244	R.K. Shumway	Boyertown, PA.	43 1-11-85	11-30-84	10-20-84 G.W.
10-22-84	T/O 660 244	G. W.	Proctor, Pa. UGI.	40 1-11-85	11-30-84	10-22-84 G.W.
10-22-84	2731	I. W.	Proctor, Pa.	96 4-3-85	12-4-84	10-22-84 G.W.
10-22-84	2737	K. FRACK	MARCO Hook, PA Gulf Interstate	32 12-12-85	12-5-84	10-22-84 (Kmf)



NORTH AMERICAN INSPECTION, INC.

P.O. BOX 88
LAURYS STATION, PA. 18059

Page 37

FORM RS-4-6

Rev. 0 (1-84)

"UTILIZATION LOG"

1. NAME John Haslowski S.S. NO 142-46-1356 DATE 1-16-85
2. TYPE SOURCE IR-192 CAMERA MODEL & S/N GC 2731
SOURCE S/N & CURIES 44 Curies 26.104
3. JOB SITES EXPOSURE LOCATION (CITY AND AREA) Clinton NJ
E.T. &
4. MAXIMUM RADIATION LEVEL AT PERIMETER OF RESTRICTED AREA < 2 MR/HR
5. RADIATION LEVEL AT 6 INCHES FROM SURFACE OF DEVICE 8 MR/HR
(When securing prior to vehicle storage)
6. RADIATION LEVEL ON SURFACE OF VEHICLE STORAGE CONTAINER 8 MR/HR
7. RESULTS OF DAILY INSPECTION OK
8. SURVEY METER NO. 23284/31299 CALIBRATION DUE DATE 3-24-85
9. LEAK TEST DUE DATE 4-3-85 QUARTERLY INVENTORY DUE DATE 1-25-85
10. QUARTERLY INSPECTION DUE DATE 3-1-85 TOTAL EXPOSURE TIME 10 min
11. TOTAL NUMBER OF EXPOSURES 10 FILM BADGE NUMBER 00038
12. RADIATION REPORT COMPLETED (YES OR NO) yes CAPS ON SOURCE TUBE No
13. SUPPLEMENTAL LOG COMPLETED (YES OR NO) No VEHICLE SURVEYED yes
14. DOSIMETER REPORT COMPLETED (YES OR NO) yes
15. DOSIMETER SERIAL NUMBERS 4020799
16. FINAL STORAGE RESULTS (MR/HR) 8
17. COMMENTS NONE

John Haslowski
RADIOGRAPHERS SIGNATURE



NORTH AMERICAN INSPECTION, INC.

P.O. BOX 88
LAURYS STATION, PA. 18059

Page 37

FORM RS-4-6

Rev. 0 (1-84)

"UTILIZATION LOG"

1. NAME Sam Simpson S.S. NO. 161-44-1444 DATE 1-16-85
2. TYPE SOURCE Ir. 192 CAMERA MODEL & S/N T/O 660 244
SOURCE S/N & CURIES 31.124 76 curies
3. JOB SITES EXPOSURE LOCATION (CITY AND AREA) Clinton, N.J.
4. MAXIMUM RADIATION LEVEL AT PERIMETER OF RESTRICTED AREA 41 MR/HR
5. RADIATION LEVEL AT 6 INCHES FROM SURFACE OF DEVICE 20 MR/HR
(When securing prior to vehicle storage)
6. RADIATION LEVEL ON SURFACE OF VEHICLE STORAGE CONTAINER 20 MR/HR
7. RESULTS OF DAILY INSPECTION OK
8. SURVEY METER NO. 33862 CALIBRATION DUE DATE 2-15-85
9. LEAK TEST DUE DATE 6-11-85 QUARTERLY INVENTORY DUE DATE 3-12-85
10. QUARTERLY INSPECTION DUE DATE 3-1-85 TOTAL EXPOSURE TIME 1.5 mins
11. TOTAL NUMBER OF EXPOSURES 1 FILM BADGE NUMBER 00020
12. RADIATION REPORT COMPLETED (YES OR NO) yes CAPS ON SOURCE TUBE yes
13. SUPPLEMENTAL LOG COMPLETED (YES OR NO) yes VEHICLE SURVEYED yes
14. DOSIMETER REPORT COMPLETED (YES OR NO) yes
15. DOSIMETER SERIAL NUMBERS 4040724
16. FINAL STORAGE RESULTS (MR/HR) 20 on top of storage container
17. COMMENTS _____

Sam Simpson

RADIOGRAPHERS SIGNATURE

ATTACHMENT 13

Employee
r/k

North American Inspection, Inc.

PO Box 88
Cory Station, PA 18059
(215) 262-1100



Director of Management and Program Analysis
United States Nuclear Regulatory Commission
Washington, DC 20555

Attention: Director

Subject: Employee Termination Exposure Report

Pursuant to 10CFR20 Sub-paragraph 20.408 (b), NORTH AMERICAN INSPECTION, INC. is furnishing to the Director of Management and Program Analysis a report of the following individual exposures to radiation while in the employ of NORTH AMERICAN INSPECTION, INC.

<u>NAME</u>	<u>S.S.#</u>	<u>EMPLOYMENT DATES</u>	<u>ACCUM. DOSE</u>
BASTARDI, V.J.	177-42-4648	3/20-6/07	370 MR
GOODRICH, D. A.	034-58-9395	3/20-6/12	720 MR
WILLIAMS, L.A.	460-68-1355	4/15-8/02	400 MR
WRIGHT, H.P.	194-42-1982	9/03-10/12	140 MR

The aforementioned accumulated dosages are taken from film badge records processed and provided by the R.S. LANDAUR, JR COMPANY.

NORTH AMERICAN INSPECTION, INC. certifies these reports to the limitation of accuracy of the reporting company (R.S. LANDAUR, JR. COMPANY).

Respectfully,
NORTH AMERICAN INSPECTION, INC.

JEG:lgo

Joel E. Guthrie, Operations Mgr./ Asst. R.S.O.

NON DESTRUCTIVE EXAMINATION SERVICES

Radiography • Magnetic Particle • Ultrasonic • Penetrants • Leak Testing • Eddy Current • Visual
Qualification • Personnel Management • Film Interpretation • Quality Assurance Overview • Expediting
• FIELD SHOP • LABORATORY •

ATTACHMENT 14

JAMES F. NICOLOSI
Manager, Byproduct Materials Program

EDUCATION

B.S. Biology, Juniata College

Additional Education:

Pennsylvania State University - Organic Chemistry

Harrisburg Hospital-School of Nuclear Medicine

Drexel University - Health Physics

CERTIFICATIONS

Radiological Technologist (Nuclear Medicine) by the American Registry of Radiological Technologists, 1975.

SUMMARY OF EXPERIENCE

Mr. Nicolosi has over twelve years of experience in managing, auditing and evaluating radiation safety programs at medical, industrial and academic facilities. Starting as Chief Technologist and Technical Supervisor for various hospital nuclear medicine programs, Mr. Nicolosi then served as a Radiological Physicist providing consulting management and auditing of medical radiation safety programs. In this capacity, he prepared federal and state licenses, calibrated diagnostic X-ray, nuclear medicine and radiation therapy equipment and was responsible for the instruction of radiological physics to resident physicians, student technologist, radiologists and ancillary staffs. Prior to joining Hydro Nuclear Services, Mr. Nicolosi was a Radiation Specialist for USNRC where he evaluated through the inspection process, all classes of licensees authorized to possess and use byproduct, source and special nuclear material. In this capacity Mr. Nicolosi also headed several in-field investigations of accidents and radiation overexposures at various industrial sites and participated in a Task Force review with Agreement State Programs on a national registry of test questions for industrial radiographers.

1985 - Present Manager, Byproduct Materials Program, Radiological Services Division, Hydro Nuclear Services. In addition to the performance of radiological engineering services, is responsible for the development of the Divisional consulting programs and services which address the medical, industrial and academic users of byproduct materials.

Radiological Engineer, Radiological Services Division, Hydro Nuclear Services. Provided consulting management services in the areas of radiological health physics, license preparation and training in the by-product, source and special nuclear materials area.

1980 - 1985 Radiation Specialist - U.S. Nuclear Regulatory Commission, Office of Inspection and Enforcement Region I. Evaluated through the inspection process all classes of licensees authorized to possess and use by-product, source and special nuclear

material. Headed in-field investigations of accidents at Becton Dickinson Company and Consolidation Coal Company and several personnel radiation overexposures at other industrial sites. Represented the Commission several times before professional groups speaking on the inspection process. Participated in a task force review with Agreement State Programs on a national registry of test questions for industrial radiographers. Reviewed licensee application requests for use of by-product material. Trained in pressurized and boiling water reactor technology, radwaste systems and MORT analysis. Participated in routine reactor health physics inspections and emergency drills.

- 1977 - 1980 Radiological Physicist, Bionucleonics Inc., Kenilworth, New Jersey. Consulting management and auditing of medical radiation safety programs. Preparation of NRC and state license applications. Calibration, quality control and equipment evaluation of diagnostic X-ray, nuclear medicine and radiation therapy instrumentation. Teaching of radiological physics to resident physicians and students technologists and in-service education to radiologists and nursing staffs. Acted as liaison between clients and regulatory agencies concerning matters of procedures, program implementation and corrective actions.
- 1975 -1976 Chief Technical Supervisor, Nuclear Medicine, Harrisburg Hospital, Harrisburg Pennsylvania. Provided supervision, scheduling, performance of instrumentation quality control, implementation of health physics procedures, development of protocols for investigation of new drugs and instruction of student technologists in clinical and didactic procedures.
- 1974 - 1975 Acting Chief Technologist, Nuclear Medicine, House of the Good Samaritan, Watertown, New York. Program development of a diagnostic nuclear medicine laboratory.
- 1969 - 1973 Head, Science Department, Grier School, Tyrone, Pennsylvania. Program development of Science Department. Teaching of physical and biological sciences.

PUBLICATIONS

Abnormal Occurrence Report - Consolidation Coal Company, Federal Register (Vol. 48. no. 13., Jan. 19, 1983. pages 2467-8).

Informational Bulletin: Selection of Adequate Monitoring Instrumentation in Emergencies, USNRC, Office of Inspection and Enforcement - April, 1983.

JAMES D. GIBSON
Manager, Health Physics and Radwaste

EDUCATION

B.S. Biology, Virginia Military Institute.
MBA Operations Management, Northeastern University.

CERTIFICATIONS

Certified Hazard Control Manager (Master Level - 1981)
Board of Hazard Control Management
American Society of Non-destructive Testing (ASNT)
Certified Level II Inspector in: Radiography, Ultrasonic Testing, Eddy Current Testing

SUMMARY OF EXPERIENCE

Mr. Gibson is currently Manager of Health Physics and Radwaste Programs for RSD and is experienced in several vital areas of the nuclear industry. He has had extensive involvement in the management of large scale radiation safety programs, computerized radiation exposure management, TLD dosimetry, support services programs for reactor outages, radiography operations, source accountability, computerized ALARA control programs and radiation safety training programs. His most recent work included the strategic planning, development and implementation of various radiation safety programs at Radiation Management Corporation, including the development of several mobile nuclear support service programs.

EXPERIENCE

1985 - Present	Manager, Health Physics and Radwaste Programs, Radiological Services Division, Hydro Nuclear Services. In addition to the performance of radiological engineering services, is responsible for staff management, project management and for the development of the Divisional consulting programs and services which address the health physics and radwaste areas including ALARA and dosimetry activities. Assures high quality of services and products for HNS clients.
1983 - 1985	Manager, Nuclear Services Division, Radiation Management Corporation (RMC). As Division Manager, Mr. Gibson was responsible for strategic planning, marketing, proposal preparation, day-to-day operation of the division and the overall quality of division operations. Mr. Gibson also functioned as Project Manager for large-scale operations including the development of several mobile nuclear support service programs.
1982 - 1983	Manager, Health Physics Services Division, Associated Technologies Inc. Mr. Gibson established this new division for

ATI and guided the division through its start-up phase of operation. During his period of employment he developed the division's strategic operating plan, marketing plan and operating procedures. While at ATI, Mr. Gibson was involved in several projects including the development and administration of an Emergency Response Training Program for Arkansas Power & Light Co., a job task analysis for reactor operators at PSE & G's Salem Nuclear Power Station and an Instructional Systems Design format General Employee Training Program for Yankee Atomic's Rowe Nuclear Power Station.

- 1974 - 1982 Corporate Radiological Safety Officer, Stone and Webster Engineering Corporation. Mr. Gibson functioned as the Corporate Radiological Safety Officer (RSO) for Stone and Webster for eight years. During this period he was responsible for managing the Corporate Office of Radiation Safety and the formulation, implementation and enforcement of a corporate radiological safety program for over 5,000 employees. During his tenure as RSO, Mr. Gibson completely reorganized Stone and Webster's radiological safety programs. Among his incorporations were: Computerized Radiation Exposure Management System (CREMS), thermoluminescent dosimetry system for personnel dose monitoring, Nuclear Support Services Program for reactor outages, radiography operating and emergency procedures, source accountability procedures, microcomputerized ALARA Control System (MACS) and several general radiation safety training programs.
- 1971 - 1974 Radiation Safety Officer, Newport News Shipbuilding Company. Mr. Gibson was the Radiation Safety Officer for all NRC-licensed activities performed at the Newport News Shipbuilding Company. During his four years at Newport News, he developed new radiography operating and emergency procedures, training programs, source accountability/leak testing/calibration and record-keeping procedures and completely reorganized the company's Radiography Auditing Program.
- 1969 - 1971 Captain, United States Army. During Mr. Gibson's two years of active military duty, he served in a variety of company grade and Battalion (Squadron) positions including: Troop (Company) Commander, Squadron (Battalion) Intelligence Officer, SURETY Program Radiological Safety Officer for the Fifth U.S. Army Area (Nuclear Warhead/Radioactive Material Safety) and as an instructor at The United States Military Academy (West Point, NY).

JAMES D. GIBSON
Page 3

PROFESSIONAL ORGANIZATIONS

American Nuclear Society - Member
American Board of Health Physics - Member
American Society for Non-destructive Testing - Member

JOHN GOOTS, JR.
Supervisor, Training Services

EDUCATION

Convair School of Nondestructive Testing, 1975.
Chabot College, Hayward, California.
Lawrence Livermore Laboratory.

Courses: Radiation Protection, Quality Engineering, Procurement Quality Assurance Interface Responsibilities, Welding Inspector Certification Seminar, Respiratory Protection for the Nuclear Industry, Quantitative Fit Testing of Respiratory Protective Apparatus using Oil Mist Aerosols, Scott Air Pak 4.5 Field Repair Training, and MSA Maintenance and Repair.

SUMMARY OF EXPERIENCE

Mr. Goots has over 30 years inspection, testing, operations and quality assurance/quality control experience in nuclear and conventional power plants, industrial facilities, and laboratories. Mr. Goots has performed duties as a Radiological Engineer and he has instructed Practical Radiation Safety Classes. Mr. Goots is certified at Level II in ultrasonics, eddy current, magnetic particle, and liquid penetrant testing. He has specialized in nuclear power plant quality control, nondestructive testing, health physics, reactor maintenance, and remote and underwater inspection techniques.

EXPERIENCE

1985 - Present Supervisor Training Services, Hydro Nuclear Services.

1983 - 1985 Senior Scientist, Health Physics and Environmental Safety Group of the Decontamination and Restoration Department, Bechtel National, Inc. Performed duties as a Radiological Engineer and Training Supervisor for the radiological work and management Group at San Onofre Nuclear Generating Station.

Assigned to the Radwaste Operations Group at the Limerick Generating Station (PECO) as the Superintendent of Protective Equipment Operations. Supervised Quantitative and Qualitative Respiratory Fit Testing, performed training, wrote procedures, lesson plans and performed audits of Bechtel and PECO respirator qualifications records. Also supervised Respiratory Maintenance Inspection, and repair of respirators and Ancillary equipment, as well as supervised issuance activities, filling of breathing air bottles, packaging of respirators and Anti-C's for transport, and the QC Inspections associated with incoming packages of protective equipment.

1982 - 1983 Q.A. Engineer, San Onofre Nuclear Generating Station, Units 2 & 3, Southern California Edison Company, Allen Nuclear Associates, Inc. Coordinated Radiation Monitoring Task Force, Developed the initial and enhanced calibration program, and

subsequently reviewed completed calibration data for accuracy, and compliance with the Technical specifications, FSAR, and applicable regulatory guides.

1979 - 1982 Randco Technology, assigned to General Electric Company. Provided support for quality assurance activities including source inspection of nuclear components (electrical and mechanical).

1975 - 1979 Service Engineer, Nuclear Services Corporation, Campbell, CA. Performed QA/QC surveillance and inspection on Unit 1 construction of the Callaway nuclear plant for Union Electrical Corp. Reviewed Technical Specification on Bechtel Corporation, Daniel Corporation; and Chicago Bridge and Irons Procedures. Performed surveillance on all nondestructive examination and welding. Performed ultrasonic, eddy current, magnetic particle and liquid penetrant testing of nuclear and conventional power plant pressure vessels, piping systems, and components.

1973 - 1975 Radiological and Special Services Technician, General Electric Company, Vallecitos Nuclear Center, Pleasanton, CA. Performed all phases of fuel manufacturing from physical examination of component parts through nondestructive examination of irradiated fuel and laboratory analysis of failed fuel.

Performed health physics, reactor maintenance, and nondestructive testing duties for nuclear power reactors. Participated in reactor maintenance functions, including control rod drive removal, LPRM removal, curtain removal, core plugging, vibration sensor removal, high radwaste removal, and sparger removal and installation.

Supervised Balanced of Plant Activities during outages at nuclear facilities. These duties included, but were not limited to, order, inventory and certification of all respiratory equipment. Other associated tasks encompassed supervising respiratory training, cleaning, inspection, fit, distribution, and implementation of ANSI standards.

1968 - 1973 Materials Test Technician, Lawrence Livermore Laboratory, Livermore, CA. Operated Instron test machine. Collected data with strain gages and by operating the Tinius Olsen machines (120 K and 60 K). Participated in data reduction on all types of tests including tensile, bulk modulus, shear, compression, and poison ratio. Performed nondestructive testing using Immerscope, Reflectoscope, Picker ferroscope and Magnaflux magnetic particle equipment.

- 1963 - 1968 Hot Cell Technician, General Electric Company, Vallecitos, Nuclear Center, Pleasanton, CA. Assisted with design and fabrication of hot cell equipment. Maintained, repaired, and decontaminated equipment in hot cell areas. Recorded and performed remote tests and reduced test data.
- 1962 - 1963 Hot Cell Technician, Westinghouse Electric Corporation, Westinghouse Testing Reactor, Waltz Mills, PA. Recorded and performed remote tests and reduced test data. Maintained, repaired, and decontaminated equipment in hot cell areas.
- 1959 - 1962 Metallurgical Tester, U.S. Steel, J and L Works, Pittsburgh, PA. Performed hardness, Rockwell, Olsen, and aging tests. Performed tensile and impact tests, reduced test data, and prepared and mounted specimens for the Metallurgical Laboratory.
- 1957 - 1959 Laboratory Technician, Westinghouse Electric Corporation, Bettis Atomic Power Laboratory, West Mifflin, PA. Operated autoclaves, vacuum annealing furnaces, pickled fuel assemblies, and prepared surfaces for assembly. Assisted in reactor assembly.

CHARLES O. GALLINA, Ph.D.
Manager, Radiological Services Division Development

EDUCATION

Ph.D. - Environmental and Radiation Science, Rutgers University
M.S. - Radiological Health, Rutgers University
B.S. - Chemistry, Fordham University

SUMMARY OF EXPERIENCE

Dr. Gallina is the current Manager of RSD Development and is experienced in several vital areas of the nuclear industry. He has had extensive involvement in emergency preparedness, environmental protection, health physics, and accident/incident investigation. He has been involved in several emergency preparedness exercises not only as a developer but also as an observer and participant. In addition he has evaluated the adequacy of emergency preparedness programs at several preoperational and operational facilities. His most recent work involved program evaluations in both Health Physics and Emergency Preparedness at both the Limerick Generating Station and the Enrico Fermi II Atomic Power Plant.

1984 - Present Manager, RSD Development, Radiological Services Division, Hydro Nuclear Services, Incorporated. In addition to his duties as Senior Radiological Engineer, coordinates all marketing activities for the Division including the development of new products and service areas, liaison with Technical Societies, as well as regulatory bodies. Ensures quality control aspects of ongoing projects and is responsible for interfacing with both clients and outside sources regarding RSD capabilities and assistance.

1984 - 1985 Director - Marketing, Radiological Services Division, Hydro Nuclear Services. In addition to his duties as Senior Radiological Engineer, coordinated all marketing activities for the Division including the development of new product and service areas, liaison with Technical Societies, as well as regulatory bodies. Ensured quality control aspects of ongoing projects and was responsible for interfacing with both clients and outside sources regarding RSD capabilities and assistance.

1982 - 1984 Senior Radiological Engineer, Radiological Services Division, Hydro Nuclear Services. Provided senior level consulting services in the areas of Health Physics, Radioactive Waste Management, Reactor Chemistry, and Emergency Preparedness. Performed program evaluation and provided management services, including regulatory liaison, to power reactors relative to planning, scheduling and program implementation. Developed and conducted training programs in all health physics areas.

- 1982 Senior Emergency Preparedness Engineer, Engineering Services Division, TERA Corporation. Provided senior level professional consulting services in all phases of Radiation Protection and Emergency Preparedness.
- 1980 - 1982 Emergency Preparedness Coordinator, USNRC. Head of all NRC-related activities governing the NRC Regional Office preparedness for and response to incidents involving licensed materials and facilities. Coordinated all NRC Regional responsibilities with respect to national-level emergency planning as well as interaction with licensees, state and federal agencies, NRC Headquarters and other regional offices of the NRC.
- Served as senior duty officer and radio-telecommunications coordinator. Maintained readiness posture of the NRC through coordination/direction of all emergency-related training programs. Served as Regional representative to Federal Standard Regional Preparedness Committee involved in national-level emergency planning.
- 1976 - 1980 Investigation Specialist, USNRC. Planned, conducted, coordinated, and reported the results of investigations concerning alleged or suspected violations of NRC regulations and federal laws which occurred at, or were related to, NRC licensed facilities and activities. Investigations involved all aspects of NRC related activities in the areas of reactor construction, material fabrication, reactor operation, health physics, fuel fabrication, security, environmental monitoring, and transportation. Headed initial investigation response team and was interview coordinator for the NRC Office of Inspection and Enforcement Investigation of the accident at Three Mile Island. Investigated several overexposures as special investigator in health physics.
- 1972 - 1976 Radiation Specialist, USNRC. Responsible for inspecting nuclear reactors under construction and in operation, as well as fuel facilities and test/research reactors from the standpoint of emergency planning, radiation protection, and environmental monitoring. As emergency planning officer, developed original NRC Regional Incident Response Plan and contributed to the development of the inspection modules to inspect NRC licensed facilities in the areas of emergency planning and environmental monitoring. Served as co-chairman of the Federal Regional Advisory Committee and Federal Field Assistance Cadre for assistance to states in radiological emergency response planning. Inspected all categories of NRC byproduct material licenses from the

standpoint of radiation protection and regulatory compliance.

1971 - 1972 Environmental Radiation Specialist, Consolidated Edison Company of New York. Audited and evaluated all health physics procedures at the Indian Point Nuclear Generating Station. Supervised and evaluated radio-ecology studies of the Hudson River at Indian Point and trained engineers in all aspects of environmental control (air, water, noise and solid waste). Coordinated the Environmental Report for Indian Point Units 2 and 3 (nuclear) and Astoria Unit 3 (fossil). Served as the Consolidated Edison representative on the New York Power Pool Environmental Committee.

PROFESSIONAL AFFILIATIONS

Health Physics Society
American Nuclear Society
Delaware Valley Society for Radiation Safety

PUBLICATIONS

Behavior of Solids Under the Influence of Ionizing Radiation, Doctoral Thesis, Rutgers University, 1971.

Accidental Exposure to a 120,000 Curie Co-60 Irradiation Source, Health Physics Society, July 1975.

AWARDS AND HONORS

Who's Who in Government
Sustained Superior Performance Award - USAEC
Special Commendation for Three Mile Island Emergency Response - USNRC
Special Citation in Emergency Planning - USNRC
PHS Special Fellowship in Radiological Health
AEC Special Fellowship in Health Physics
FWPCA Special Fellowship in Water Pollution Control
Special Consultant in Emergency Preparedness - Emergency Council -
Borough of Royersford, PA

DALE E. DONALDSON
Director, Radiological Services Division

EDUCATION

B.S. Ohio State University

SUMMARY OF EXPERIENCE

Mr. Donaldson is an expert in the planning, scheduling, implementation, and evaluation of emergency preparedness and radiation protection programs for nuclear facilities. Mr. Donaldson gained invaluable experience as a member of the NRC investigation team for the accident at Three Mile Island. He was also involved with nuclear incident assessment and control and radiation protection activities while working for the U.S. Army and Nuclear Regulatory Commission. His most recent work has involved the evaluation, planning, scheduling, and related management of the implementation of the Health Physics Program at the Limerick Generating Station, Shoreham Station, and Vogtle Electric Generating Plant in preparation for licensing.

1985 - Present Director, Radiological Services Division, Hydro Nuclear Services. Provides overall Divisional executive management, direction and coordination for all professional consulting aspects of HNS operations. Responsible for all routine and special RSD projects, regulatory affairs, project planning and development, quality control of RSD operations and executive liaison functions both internally within HNS and with respect to client executive management.

1982 - 1985 Senior Radiological Engineer and Director of East Coast Operations, Radiological Services Division, Hydro Nuclear Services. Provided senior level consulting services in the areas of Health Physics, Radioactive Waste Management, Reactor Chemistry, and Emergency Preparedness. Performed program evaluation and provided management services to power reactors relative to the planning, scheduling, and implementation of these programs.

Senior Engineer, Engineering Services Division, TERA Corporation. Provided professional consulting services in all phases of Radiation Protection and Emergency Preparedness.

1975 - 1982 Health Physicist, U.S. Nuclear Regulatory Commission, Region I Office of Inspection and Enforcement. Was responsible for inspecting emergency planning, radiation protection and environmental monitoring programs at nuclear power reactors, nuclear fuel facilities and test and research reactors; developing and maintaining a Regional Incident Response Plan; serving as co-chairman of three Federal Regional Advisory Committees and the

Federal Field Assistance Cadre for assistance to states in radiological emergency response planning; member of the NRC Office of Inspection and Enforcement Investigation Team for the accident at Three Mile Island; contributing author of NUREG-0654 and the NRC health physics and emergency preparedness appraisal programs; member of a Nuclear Regulatory Commission Health Physics Appraisal Team, and Team Leader of a Nuclear Regulatory Commission Emergency Preparedness Appraisal Team.

1969 - 1975

Chemical, Biological and Radiological Officer, U.S. Army. Various titles with Supervisory responsibility and instructor duties involving: Radiation safety, nuclear accident/incident assessment and control; civil and military emergency preparedness; nuclear weapons effects; project management for the research, development, test and evaluation of radiological items of equipment and instrumentation, and radiological safety policies and procedures.

PUBLICATIONS

NRC Health Physics Appraisal Program, (NUREG-0855) U.S. Nuclear Regulatory Commission, May 1980.

Investigation Into the March 28, 1979 Three Mile Island Accident by Office of Inspection and Enforcement, NUREG-0600, U.S. Nuclear Regulatory Commission, August 1979.

Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants, (NUREG-0654) U.S. Nuclear Regulatory Commission and Federal Emergency Management Agency, January 1980.