Schnabel Engineering

US Nuclear Regulatory Commission Region I

April 15, 2005

ATTN: Donna M. Janda
Health Physicist
Security and Industrial Branch
Division of Nuclear Materials Safety

MS 16
J-5

Subject: Amendment to License No. : 45-19703-01
Docket No. : 03019126
Mail Control No. : 136434

Ms. Janda,

I am requesting an amendment to the Schnabel Engineering Materials License stating that the storage location of 101 Bayard Street, New Brunswick, NJ. 08901 be deleted from the list of Facility storage locations. This particular location was recently closed, and never actually stored any licensed materials. I have also included the items you requested to be added to the Operating and Emergency Procedures established by Schnabel Engineering, Inc. Attached below are the items:

1. Revision to NDE-RS-01 "O&E Procedure" Sec. B, Item (9) (B), step 6
2. Revision to NDE-RS-01 "O&E Procedure" Sec. C, Source Retrieval Guidelines, the Intensity and Dose formula
3. Revision to NDE-RS-01 "O&E Procedure" Sec. D, Item (7), step 7 and "NOTE"
4. Revision to NDE-RS-03 "Training, Testing, and Qualification...", No. 4 (a)
5. Copies of the exams and their answer sheets
6. Sample copies of annual refresher training, practical exam form, and certification form for radiographers

Recently you were submitted a *"NEW"* NDE-RS-03, replacing the previous NDE-RS-03 and upon insertion of the above revised items and a review of the new Operating and Emergency Procedures, please continue the amendment process. Please contact me here in Richmond, VA. if further assistance is needed, thank you.

Regards,

Jackie C. Riggs, Jr.
Corporate RSO
Schnabel Engineering, Inc.
1 West Cary Street
Richmond, Va. 23220
Tele: (804) 649-7035
Fax: (804) 649-7051
Cell: (804) 380-4860

136434

NMSS/RGN1 MATERIALS-002

Schnabel Engineering

Please see the attached copy of a previously performed 8-hour refresher training class that was held here in our Richmond, VA. Facility. Generally, I like to break this up into 2 different classroom settings. The topics of discussion are generally the same with the exception of any amendments that require discussing, industry events or violations or if there is a particular discipline or topic that needs to be addressed.

during radiographic operations. (Observe for a steady alarm, not an intermittent chirp)

Step 1 Halt all radiographic operations and exit the area

Step 2 Check the pocket dosimeter reading

Step 3 Check the operation of the survey meter

Step 4 Check the dosimeters of other workers in the area

Step 5 Check proper storage of the source

Step 6 Notify your Facility RSO

(9) (B) **PROCEDURE FOR RESPONSE TO OFF-SCALE DOSIMETER**

This procedure shall be followed in the event that an individual's pocket dosimeter is found to be off-scale during radiographic operations.

Step 1 Halt all radiographic operations and return the source to its shielded locked position. Survey the circumference of the exposure device, including the guide tube and collimator, to verify the source is in the shielded position and the survey meter is operable.

Step 2 All radiographic personnel shall check and document their pocket dosimeter readings.

Step 3 Compare the results of the survey of the exposure device at the surface with the previously documented survey when the device was initially removed from storage. This comparison will verify survey meter accuracy.

Step 4 Immediately notify the Facility and Corporate RSO of the event. The RSO shall evaluate the situation and provide further instructions.

Step 5 Evaluate and document the possible cause of the off-scale dosimeter(s) by retracing prior actions and making calculations to determine the highest possible exposure(s) which could have been received.

Step 6 The Corporate/Facility RSO shall send in the badge(s) for processing immediately (within 24 hours), and exclude all individuals involved from radiographic operations until results have been attained.

Step 7 The Corporate RSO shall document the event, including the results of the internal inspection, and maintain the documentation on file for inspection by regulatory agencies.

RADIOGRAPHIC OPERATING AND EMERGENCY PROCEDURES

Intensity and Dose Calculations

1. Inverse Square Law

$$\frac{I_1}{I_2} = \frac{D_2^2}{D_1^2}$$

Where: I_1 = Initial Radiation Intensity at d_1

I_2 = Radiation intensity at d

d_1 = Initial Distance from Source

d_2 = Distance at which intensity is I_2

Dose Rate Formula

D = Dose Rate (multiplied by) Time

Where D = radiation dose in units of mR or R

DR= radiation dose per unit of time (unit of mR/hr or R/hr)

T= time

Radiation Intensity/Half-Life Table

Radioactive Material	Dose Rate at 1 foot	Half-Life	Energy of Gamma Rays (Mev)
Iridium 192	5.2 R/hr	75 days	.137 to .65
Cobalt 60	14.0 R/hr	5 years	1.17 and 1.33

Step 5 Remove swab (B) from plastic container. Using dry swab, wipe the inner area of the device. Replace swab (B) into the plastic container.

Step 6 Replace the storage plug or hold down cover.

Step 7 Take the swabs, in their plastic containers, to the survey meter and note the readings when the container is in contact when the meter. If the radiation levels detected on the swabs are less than .2 mR/hr above background, complete the leak test information on the leak test kit return envelope, place the swabs inside the mail to the leak test vendor.

NOTE: If the survey detects more than .2 mR/hr (above background) during the swab survey, DO NOT MAIL THE SWAB. Attach a completed Red Tag to the exposure device to source changer and return the exposure device or source changer to storage. Immediately notify the Division and Corporate RSO.

Step 8 this procedure shall be completed twice. One leak test kit will be labeled for the source leak test, and the other kit will be labeled for the exposure device, or changer to check for depleted uranium contamination.

Step 9 Source leak tests are required every six (6) months, and exposure device or changer leak tests are required annually.

(8) LEAK TEST SWAB PROCEDURE FOR AMERSHAM (AEA) MODEL 773 INSTRUMENT CALIBRATOR

This procedure shall be followed when performing required leak tests on the Amersham (AEA) model 773 Instrument Calibrator.

Personnel shall wear all required personnel monitoring devices when performing leak tests on the model 773 instrument calibrator.

All requirements of SEI NED-RS-01, Sections A and B shall be strictly adhered to when performing leak tests on the model 773 instrument calibrator.

Additional Safety Precautions

- wash hands after performing leak test, and
- do not smoke while performing leak test

Step 1 After posting the restricted area, unlock the calibrator and remove the shipping cover.

TRAINING, TESTING, AND QUALIFICATION OF RADIOGRAPHIC PERSONNEL

1. PURPOSE

The purpose of this procedure is to outline the training and testing of those individuals responsible for the radiation safety program, otherwise referred to as Radiation Safety Officer (RSO) or Facility Radiation Safety Officer (FRSO), those who perform radiographic operations in the capacity of a Radiographer and Radiographer Assistant and the qualifications thereof.

2. RADIATION SAFETY OFFICER

The minimum qualifications, training, and experience for RSO's for industrial radiography are that the individual has received training in:

a. Fundamentals of radiation safety [Ref. 10 CFR 34.43 (g)(1)(i)(ii)(iii)(iv)(v)]
b. Radiation detection instruments [Ref. 10 CFR 34.43 (g)(2)(i)(ii)(iii)]
c. Equipment to be used [Ref. 10 CFR 34.43 (g)(3)(i)(ii)(iii)]
d. The requirements of pertinent Federal regulations
e. Case histories of accidents in radiography
f. 2000 hours of hands-on experience as a qualified radiographer in industrial radiographic operations; and
g. Formal training in the establishment and maintenance of a radiation protection program.

3. FACILITY RADIATION SAFETY OFFICER

The minimum qualifications, training, and experience for Facility RSO's for industrial radiography are that the individual has received training in:

a. Letters a. through f. from number 2
b. Is certified through a radiographer certification program by a certifying entity such as ASNT or its equivalent; and
c. Received specific training relating to Schnabel's Operating and Emergency Procedures.

4. RADIOGRAPHER

The minimum qualifications, training, and experience for radiographers for industrial radiography are that the individual has received training in:

a. Letters a. through e. from number 2 and 2 months of on-the-job training
b. Letters b. and c. from number 3
c. Has received copies of and instruction in the requirements described in NRC regulations 10 CFR parts 19, 20, 21, 30, 34, and 71.
d. Has received copies of and instruction in company Operating and Emergency Procedures

Schnabel Engineering Radiography Safety Exam No. 1

Name _____ Date _____

Examiner _____ Grade _____

1. The concept of ALARA is related to the:

    a. Need for alarming rate meters at fixed radiographic facilities
    b. Use of composite materials for radiation shielding
    c. Use of a specific type of gamma radiation exposure device
    d. Policy that any unnecessary exposure to radiation is excessive.

2. The safe use of X-ray machines is controlled by:

    a. Regulations of each state in which the equipment is used.
    b. US Nuclear Regulatory Commission (NRC)
    c. Manufacturers license radioactive equipment
    d. Creating an unstable, radioactive isotope

3. Gamma rays and X-rays differ in their:

    a. Penetrating capability
    b. Source or origin
    c. Detectability with a survey meter
    d. Strength

4. One of the ways that X-rays and gamma rays affect living cells is by:

    a. Making the cells radioactive
    b. Interfering with their function or reproduction
    c. Increasing mitosis
    d. Increasing potential hereditary mutations

5. The biological effect of X-rays, Gamma rays, and Alpha particles are considered:

    a. Different and use a "quality factor" to convert exposure to REM's
    b. Equivalent unless ingested
    c. Similar due to the resulting ionization of human cells
    d. Different when considering genetic effects

6. Which is a major cause of radiation over-exposures during radiography? The:

    a. Improper use of a personnel-monitoring badge.
    b. Wrong type of source has been stored in the exposure device.
    c. Source has not been secured in the shielded (stored) position
    d. Improper use of the survey meter.

Schnabel Engineering Radiography Safety Exam No. 1

7. Photoelectric effect is a (n):

   a. Result of nuclear disintegrations
   b. Form of the ionization process
   c. Process of forming an image on photographic film
   d. Process that creates electrons

8. Ionization is a process that:

   a. Maintains the electrical balance of an atom.
   b. Results in an atom losing energy.
   c. Causes x-rays and gamma rays to lose energy
   d. Causes material to become radioactive

9. Attenuation of the primary beam of gamma radiation usually results from:

   a. Complete transfer of shielding material atoms into daughter elements
   b. Photoelectric Effect and Compton Scattering.
   c. Electron capture in the absorbing material
   d. Displacement of protons from the K-shell orbiting position

10. Half-life relates to unstable atoms of isotopes:

   a. Transforming to a more stable form; losing half its activity in a specific period of time.
   b. Emitting alpha and beta particles and x-rays from their nucleus
   c. Never reaching stability and remain radioactive after emitting some form of energy
   d. Releasing energy in a miniature chain reaction called flooding

11. Pocket dosimeters used by radiation workers must have a range of at least:

   a. 0 - 200 mR
   b. 0 - 500 mR
   c. 0 - 200 R
   d. 0 - 1 Roentgen

12. Which sequence should be followed when setting up gamma ray equipment

   a. Connect guide tube, connect control cable, set to "operate position.
   b. Set to "operate position connect guide tube, connect control cable,
   c. Connect control cable, connect guide tube, set to "operate position
   d. Connect control cable, set to "operate position, connect guide tube

13. The term "REM" is used to quantify absorbed radiation dose by a person, and is the:

   a. Radiation dose received in RADs multiplied by the Quality Factor (QF)
   b. Amount of radiation absorbed by 1 gram of animal tissue
   c. Amount of radiation absorbed by 1 cubic centimeter of animal tissue
   d. Product of dose rate and time of exposure

Schnabel Engineering Radiography Safety Exam No. 1

14. The use of licensed Radioactive Materials in an Agreement State is authorized by:

    a. The particular Agreement State
    b. US Nuclear Regulatory Commission (NRC)
    c. Manufacturers license radioactive equipment
    d. The company holding the license

15. Damage to human chromosomes and genes from ionizing radiation produces:

    a. Somatic effects
    b. Genetic effects
    c. Erythema
    d. Epilation

16. An element having the same chemical properties but different nuclear properties is called a(n):

    a. Molecule
    b. Isotope
    c. Ion
    d. Atom

17. Which of the following has the shortest wavelength?

    a. Visible light
    b. Microwaves
    c. 100 kilovolt x-rays
    d. Infrared radiation

18. During daily inspection of radiography equipment, if the exposure device lock malfunctions, it is necessary to:

    a. Take the equipment out of service until repaired
    b. Note the defect on the utilization log and continue use until the next scheduled maintenance is performed
    c. Remove the lock until formal maintenance is required
    d. Notify the manufacturer as soon as possible

19. Records of quarterly inventories performed on all licensed radioactive materials must be retained on file for:

    a. 1 year
    b. 2 years
    c. 3 years
    d. 5 years

Schnabel Engineering Radiography Safety Exam No. 1

20. Replacement of a sealed source in an exposure device must be performed by:

    a. Radiographers only
    b. Radiographers or assistant radiographers
    c. Only persons specifically authorized by the cognizant regulatory agency
    d. The RSO or radiographer.

21. Survey meters used in field radiography must be calibrated (NRC) at least every:

    a. Month
    b. 3 months
    c. 6 months
    d. Year

22. All survey meters must be calibrated:

    a. Daily or before each use
    b. On each available scale on the meter
    c. With the type of isotope being used
    d. At the maximum expected radiation intensity levels

23. Saturation of a Geiger-Mueller (G-M) survey instrument, refers to:

    a. Malfunctioning due to moisture exposure
    b. An inability to calibrate the instrument due to high amperage batteries
    c. A damaged instrument due to excessive current
    d. A false "zero" reading due to high radiation exposure

24. An individual is continuously present in a 100 mR/hr radiation field during five (5) radiographic exposures. Each exposure is three (3) minutes in duration. What is the total exposure at the end of the five (5) exposures?

    a. 5 millirem (0.05 mSv)
    b. 15 millirem (0.15 mSv)
    c. 20 millirem (0.20 mSv)
    d. 25 millirem (0.25 mSv)

25. How many Roentgens (R) is/are represented by 32 milliRoentgens?

    a. 0.0032
    b. 0.032
    c. 0.320
    d. 3.200

Schnabel Engineering Radiography Safety Exam No. 1

26. Calculate your exposure if you remain at an intensity of 600 mr/hr for 11 minutes.

a. 11 mrem
b. 22 mrem
c. 110 mrem
d. 220 mrem

27. When a radioisotope is in its stored position in a source device, there must be no radiation levels that exceed:

a. 200 mr/hr at any exterior surface and 10 mr/hr at one meter from any exterior surface
b. 50 mr/hr at 6 inches from any exterior surface of the source device
c. 50 mr/hr at any exterior surface and 10 mr/hr at 3 feet from any exterior surface
d. 200 mr/hr at any exterior surface and 50 mr/hr at 6 inches from any exterior surface

28. A "Controlled or Restricted Area" :

a. Must control access of unauthorized personnel and may be posted with ropes & radiation warning signs at 2 mREM/hr
b. Must be posted with ropes & radiation warning signs at 5 milliREM/hr
c. Requires flashing radiation warning lights
d. Defines an area used for storage of an X-ray machine when not in use

29. ALARA represents:

a. Radiation boundaries requiring flashing radiation warning lights
b. A philosophy of maintaining radiation exposure as low as reasonably achievable
c. A type of radiation monitoring equipment that is sensitive to particulate radiation
d. A radiation level that requires prompt evacuation of the area

30. OSLD (Optically Stimulated Luminescent Dosimeters) are used to:

a. Replace less-accurate, self-reading dosimeters
b. Provide a permanent record of occupational radiation exposure
c. Visually monitor radiation intensity
d. Monitor radiation energy and intensity

31. When a source is retracted into the source device from a collimated exposure, the survey meter reading should:

a. Initially read "zero" then steadily increase
b. Increase, then decrease
c. Decrease, then increase
d. Increase, then remain constant

Schnabel Engineering Radiography Safety Exam No. 1

32. Leak tests are performed on radioactive sources at regular intervals to check for

a. Alpha particle decay
b. Gamma ray leakage
c. Loss of capsule lubricant
d. Contamination from a rupture of the sealed source

33. Before transporting a source device to a field site, the radiographer must:

a. Secure the source device against movement in the vehicle
b. Place flashing yellow lights on the roof of the vehicle
c. Place the source device in an overpack
d. Transfer the source to a storage container

34. There are two types of radiation survey meters. They are:

a. Geiger-Mueller (G-M) and Ionization Chamber
b. Geiger-Mueller (G-M) and alarm ratemeter
c. Ionization Chamber and TLD
d. TLD and alarm ratemeter

35. The Transport Index (TI) is a measurement taken at:

a. 1 meter from the outside of the surface of a shipping container
b. 3 feet from the locked exposure device
c. The surface of a locked exposure device
d. 6 inches from a shielded source

36. Generally, what is the practical limit on the number of guide tube extensions (7 feet each tube length) that can be attached to an exposure device?

a. 2
b. 3
c. 4
d. The specific number should be determined by the distance you want from the exposed source during exposures

37. During absorption of x-rays or gamma rays, pair production can occur when the photons are in the range of:

a. 30 to 50 Kev
b. 0.025 to 0.1 Mev
c. 0.1 to 1.0 Mev
d. 1.02 Mev or greater

Schnabel Engineering Radiography Safety Exam No. 1

38. The most important radiation survey is the one made:

    a. At the unrestricted area perimeter
    b. At the high radiation boundary
    c. Before shipping or transporting the exposure device
    d. After an exposure

39. In order to determine that a source has been fully retracted into the exposure device, the radiographer must:

    a. Count at least 9 turns of the crank handle as the source is retracted
    b. Turn the crank toward the exposed direction, then retract such that the resistance in the crank handle indicates the source is retracted
    c. Survey the entire circumference of the source device including the guide tube.
    d. Watch the survey meter reading as the source is retracted. If the expected reading increases and then decreases, then the retracted source is confirmed

40. Which of the devices below has the best capability of measuring relatively low levels of radiation?

    a. Ionization chamber survey meter
    b. Pocket dosimeter
    c. Geiger-Mueller (G-M) counter
    d. Thermoluminescent Dosimeter (TLD)

Schnabel Engineering Radiography Safety Exam No. 1

Exam Specification

1.	Radiation Principles & Fundamentals	27%	11
2.	Biological Effects	5%	2
3.	Detection & Measurement of Radiation	20%	8
4.	Radiographic Equipment	5%	2
5.	Methods of Limiting Exposure	10%	4
6.	Operating & Emergency Procedures	17%	7
7.	NRC & State Regulations	8%	3
8.	Transportation	8%	3

Schnabel
Schnabel Engineering South, LLC

NAME: **DATE:**

S/S #: **SCORE:**

ASSISTANT RADIOGRAPHER GENERAL EXAM

1. The acronym ALARA stands for:
   a. As long as radiation attenuates
   b. Always leave a radiation area
   c. As low as reasonably achievable
   d. As low as requirements allow
2. The safe use of x-ray machines is regulated by:
   a. Regulations of each state in which equipment is used
   b. Manufacturers license radioactive equipment
   c. Company rules and regulations
   d. Creating an unstable radioactive isotope
3. Gamma rays and x-rays differ in their:
   a. Penetrating capability
   b. Source or origin
   c. Detect ability with a survey meter
   d. Strength
4. Which is a major cause of radiation over-exposures during radiography:
   a. Improper use of film badges
   b. Wrong type of source stored in the exposure device
   c. Source not fully retracted in the shielded position
   d. Improper use of a survey meter
5. Attenuation of the primary beam of gamma radiation usually results from:
   a. Complete transfer of shielding material atoms into other elements
   b. Photoelectric effect and Compton scattering
   c. Electron capture in the absorbing material
   d. Displacement of protons from the k-shell orbiting position
6. Half-life relates to unstable atoms of isotopes:
   a. Losing half its activity in a specific period of time trying to become stable
   b. Emitting alpha and beta particles from their nucleus
   c. Never becoming stable and remaining radioactive after emitting some form of energy
   d. Releasing energy in a mini-chain reaction called flooding
7. Pocket dosimeters used by radiation workers must have a range of at least:
   a. 0 – 200mr
   b. 0 – 500mr
   c. 0 – 200R
   d. 0 – 1 roentgen
8. Which sequence should be followed when setting up gamma ray equipment:

a. Connect guide tube, connect control cable, set to operate position
b. Set to operate position, connect guide tube, connect control cable
c. Connect control cable, connect guide tube, set to operate position
d. Connect control cable, set to operate position, connect guide tube

9. The use of licensed radioactive materials in an agreement state is authorized by:
   a. The particular agreement state
   b. The USNRC
   c. Manufacturers license radioactive equipment
   d. The company holding the license
10. Damage to human chromosomes and genes from ionizing radiation produces:
   a. Somatic effects
   b. Genetic effects
   c. Delayed effects
   d. Depilation
11. During daily inspections of radiographic equipment, if the exposure device malfunctions, it is necessary to:
   a. Take equipment out of service, notify the RSO
   b. Note the defect on the utilization log and continue to use
   c. Remove the lock until formal maintenance is completed
   d. Notify the manufacturer as soon as possible
12. Records of quarterly inventories on all licensed radioactive materials must be retained on file for:
   a. 1 year
   b. 2 years
   c. 3 years
   d. 5 years
13. Transfer of radioactive materials in an exposure device must be performed by:
   a. Radiographers only
   b. Assistant radiographers
   c. The RSO
   d. All the above
14. Survey meters used in field radiography must be calibrated as per the USNRC at least every:
   a. Month
   b. 3 months
   c. 6 months
   d. Once a year
15. How many roentgens (R) is/are represented by 32 milliroentgen (mr):
   a. 0.0032
   b. 0.032
   c. 0.320
   d. 3.200
16. An individual is continually present in a 100 mr/hr radiation field during 5 exposures, each exposure is 3 minutes long. What is the total exposure at the end of 1 exposure and 5 exposures:
   a. 5 mr and 15 mr

b. 3 mr and 15 mr
c. 5 mr and 25 R
d. 5 mr and 25 mr

17. A controlled or restricted area:
    a. Must be posted with ropes and radiation warning signs at 2 mr/hr
    b. Must be posted with ropes and radiation warning signs at 5 mr/hr
    c. Requires flashing radiation warning lights
    d. Defines an area used for storage of an x-ray machine when not in use
18. When a source is retracted into the source device from a collimated exposure, the survey meter reading should:
    a. Initially read zero then steadily increase
    b. Increase, then decrease
    c. Decrease, then increase
    d. Increase then remain constant
19. Leak tests on source devices are performed why and when:
    a. For alpha particle decay / every 6 months
    b. For gamma ray leakage / every 3 months
    c. Contamination from a ruptured sealed source / every 3 months
    d. Contamination from a ruptured sealed source / every 6 months
20. Before transporting a source device to a jobsite, The radiographer must:
    a. Secure the source device in the vehicle to prevent shifting
    b. Place flashing lights on top of the vehicle
    c. Place the source device in an over pack
    d. Transfer the source to a storage container
21. The transport index (TI) is a measurement taken at:
    a. 1 meter from the outside of the surface of a shipping container
    b. 3 feet from the locked exposure device
    c. The surface of the locked source device
    d. 6 inches from a shielded source
22. The most important radiation survey is the one made:
    a. At the restricted area
    b. At the high radiation area
    c. Before shipping or transporting the exposure device
    d. After an exposure
23. In order to determine that a source has been fully retracted into the exposure device, the radiographer must:
    a. Count the number of cranks
    b. Turn the crank toward the exposed direction to ensure the source does not crank out
    c. Survey the entire circumference of the source device including the guide tube
    d. Watch the survey meter to ensure a decrease of the radiation field to confirm that the source is shielded
24. If someone enters your posted boundary while the source is exposed, you should:
    a. Tell him/her to hurry up and leave and that its okay
    b. Retract the source, escort the person out of the area before resuming

c. Scream, holler and curse at the person
d. Do nothing

25. If you discover that the source is stuck and can't be retracted to the shielded position, you should:
    a. Survey the area, move the boundaries if necessary, contact the RSO and maintain constant surveillance of the area
    b. Try to retract the source by any means
    c. Disconnect the guide tube to locate the source
    d. Scream, holler and curse at your co-worker

Schnabel Engineering

RADIOGRAPHER LEVEL II PRACTICAL

NAME: _____ DATE: _____ SCORE: _____

TOPIC	SCORE	MAX. %
IS RADIATION SURVEY/TRANSPORTATION REPORT PROPERLY FILLED OUT?		8%
DO PERSONNEL HAVE REQUIRED DOSIMETRY AND CALIBRATED AND OPERABLE SURVEY METER?		8%
WAS THE UTILIZATION LOG FILLED OUT PROPERLY?		8%
IS EXPOSURE DEVICE BEING PROPERLY SURVEYED?		8%
HAVE REQUIRED EQUIPMENT CHECKS BEEN MADE?		8%
IS EXPOSURE DEVICE BEING PROPERLY TRANSPORTED?		8%
WAS THE PROPER SEQUENCE UTILIZED FOR EQUIPMENT "HOOK-UP"?		8%
IS THE CALCULATED RESTRICTED AREA POSTED WITH PROPER SIGNS AND ROPE?		8%
DURING THE EXPOSURE, IS THE RESTRICTED AREA PROPERLY SURVEYED?		8%
DURING THE EXPOSURE, WAS VISUAL SURVEILLANCE MAINTAINED?		8%
IS THE EXPOSURE DEVICE PROPERLY SURVEYED AFTER EACH EXPOSURE?		10%
WAS A LOCK-OUT SURVEY PERFORMED AND THE SOURCE STORED PROPERLY?		10%

COMMENTS:

_____

_____

_____

_____

ADMINISTRATOR: _____

TITLE: _____ DATE: _____

Schnabel Engineering South, LLC

QUARTERLY AUDIT FOR RADIOGRAPHER

Date: _____

Radiographer Name: _____

Signature of Radiographer: _____

RSO/Auditor Name: _____

RSO/Auditor Signature: _____

Jobsite Location: _____ Radiographers Base Locale: _____

Exposure Device Model #: _____ S/N: _____ Source: _____ S/N: _____

Survey Meter Make: _____ Model: _____ S/N: _____ Date Cal. Due: _____

The purpose of unscheduled audits is to ensure that personnel are adhering to NRC/State Regs., company procedures and safe conduct.

1. Is radiation area posted, being surveyed and controlled adequately? Y N
2. Is the "high radiation area" sign posted? Y N
3. Is the exposure device being properly surveyed after each exposure? Y N
4. Are the survey reports being properly completed? Y N
5. Does the radiographer have a copy of the O&E Procedures, License and Regulations? Y N
6. Is the current leak test, decay chart and proper postings available? Y N
7. Is the radiographer using a calibrated dosimeter and rate meter properly? Y N
8. Does the Radiographer have the current month film badge? Note month _____ Y N
9. Is the source being secured in the shielded position after each exposure? Y N
10. Is the radiographer providing adequate supervision of the AR/RT? Y N
11. Is the source being transported properly? Y N

Note any remarks or actions taken here: _____

_____

_____

_____

_____

Schnabel Engineering South, LLC

QUARTERLY AUDITS FOR ASSISTANT RADIOGRAPHERS AND TRAINEES

Date: _____

Ass't Radiographer/Trainee Name: _____

Ass't Radiographer/Trainee Signature: _____

Radiographer Name: _____

RSO/Auditor Name: _____

RSO/Auditor Signature: _____

Jobsite location: _____ AR/RT Base Locale: _____

Exposure Device Model #: _____ S/N: _____ Source: _____ S/N: _____

Survey Meter Make: _____ Model: _____ S/N: _____ Date Cal. Due: _____

The purpose of unscheduled audits is to ensure that personnel are adhering to NRC/State regs., company procedures and safe conduct.

1. Is the radiation area posted, being surveyed and controlled adequately? Y N
2. Is the "high radiation area" sign posted? Y N
3. Is the exposure device being properly surveyed after each exposure? Y N
4. Is there a copy of the O&E Procedures, License and Regulations at hand? Y N
5. Is the AR/RT using a calibrated dosimeter and rate meter properly? Y N
6. Does the AR/RT have the current month film badge? Note month _____. Y N
7. Is the source being secured in the shielded position after each exposure? Y N

Note any remarks or actions taken here: _____

_____

_____

_____

_____

Schnabel
Schnabel Engineering South, LLC

RADIOGRAPHER – HAZMAT EMPLOYEE – DRIVER
(Previously Trained and Certified With Another Licensee)

I. Name: Scott E. _____ SSN: _____

Date employed: 9/7/04 Date of Birth: _____

Location Address: Cary St City: Rich State: Va. Zip: 23220

II. This person has satisfactorily completed formal radiation safety training concerning the topics addressed in Title 10 CFR 34 and the comparable provisions of Agreement State regulations. This person was certified and performed the functions of radiographer while employed by another licensee. Data relating to this person's training and certification is as follows:
Dates of Training: 6/2/01 to 6/6/01 Number of Training Hrs: 40 Hrs.

Training Provided by (instructor or institution): QSL Inspection, Inc.
Inst Address: _____ City: Trainer State: Pa. Zip: N/A

Dates of Radiographer Certification: _____ to _____

Licensee Name: _____

Licensee Address: _____ City: _____ State: _____ Zip: _____

AND/OR

Rad. Card: #144242 Issue Date: 11/03 Date Exp: 11/08

Authorization: X-Ray & RAM Issued by (ID of certifying entity): ASNT

■ Certificate, legible copy of certification card, or other documentation attached to support above listed information. **NOTE:** Additional verification is required if attached evidence is incomplete or references quality related certifications.

☐ Licensee refused to provide documentary evidence of training and certification.
Verification by telephone. Date of telephone verification: _____
Name of person contacted: _____ Title (must be mgm't): _____
Agency or certifying entity ID: _____ State/certifying entity rep. Name: _____

Signature of Company rep Verifying information: _____

The following additional training was provided when the above listed training is less than 40 hours
Training Dates: _____ to _____ Additional Hrs. Provided: _____ Hrs.

Instructor's name: _____ Address: _____

III. This person has also worked as a radiographer while employed by other licensees on the dates shown below:
Licensee: Conam/QSL Inspection From: 06/01 to: 09/04

Licensee: GE Inspection From: 2000 to: 06/01

IV. This person has received specific radiation safety, hazmat employee, and driver training:

Training Dates: 9/8/04 to: 9/9/04

Instructors Name: Jackie Riggs Title: CRSO

Address: 1 West Cary St. City: Richmond State: Va. Zip: 23220

V. Successfully completed the written test, and demonstrated their ability to use the materials and equipment associated with the position of Radiographer, hazmat employee, and driver:

Exam Date: 9/9/04 Exam Score: 80%

VI: I have received a copy of Schnabel Engineering Inc. Operating and Emergency Procedures; By-Product Material License, and the applicable Agreement State Regulations. I have received instruction, read the contents, fully understand all Rules and regulations, and will follow them at all times. I further understand That violation of these rules and regulations will be cause for disciplinary action. I hereby certify the above information is true and correct to the best of my Knowledge:

Signature of Radiographer: _____ Date: _____

VII. I hereby certify the above information is true and correct to the best of my knowledge:

_____ Date: _____
Signature of Branch Manager or Facility Radiation Safety Officer

_____ Date: _____
Approved as a Radiographer: Signature of Corporate Radiation Safety Officer

Schnabel

Schnabel Engineering South, LLC

Schnabel Engineering

CERTIFICATE OF TRAINING

This Is To Certify That: Scott

Has satisfied the training requirements of the U.S. Department of Transportation Title 49, part 172.704, Schnabel Engineering, Inc.'s Radiation Safety and Control Program, and all Regulations as set forth by the Agreement States and the NRC.

Radiographer Status: Radiographer

Central Certification Expiration Date: ASNT – 11/08

SEI 40 hr. Rad Safety Training: 8 hr Refresher – 9/8/04

Hazmat Recurrent Training Performed: 9/9/04

Certifier's Signature: **Date:**

Jackie Riggs, Jr.
Corporate Radiation
Safety Officer

Schnabel
Schnabel Engineering South, LLC

REFRESHER TRAINING FOR RADIOGRAPHERS AND ASSISTANT RADIOGRAPHERS.

ANNUAL 8 HRS AS REQUIRED BY THE USNRC

NAME	S/S #	DATE	
PAUL SHERWOOD		4/6/04	4:00PM - 8:00pm
JOHN BAXTER		4/6/04	
PATTON HAMMOND		04/06/04	
JACKIE RIGGS		4/6/04	
PAUL SHERWOOD		4/7/04	3:30 PM - 7:30 PM
JOHN BAXTER		4/7/04	
PATTON HAMMOND		04/07/04	
JACKIE RIGGS		4/7/04	

Topics discussed: RADIATION HAZARDS, RADIOACTIVE MATERIALS, ABSORPTION & SCATTER, RADIATION DOSE & DOSE RATE, RADIATION MEASUREMENT UNITS, BIOLOGICAL EFFECTS OF IONIZING RADIATION, RADIATION MEASURING DEVICES, TRANSPORTING SOURCES, RADIATION SURVEYS, SCHNABEL O&E PROCEDURES & PRACTICAL.

Duration of training: 8 HRS. (2 DAYS) FOLLOWED BY A 25 QUESTION TEST

Training performed by: JACKIE C. RIGGS, JR. Title: C.R.S.O.

Signature: Date: 4/7/04