

Magnum Midstream, LP
License No. 37-35141-01
Docket No. 030-38732
Control No. 583577
5-28-2014

Dear,

John J. Miller
Health Physicist
Division of Nuclear Materials Safety

The following information is put together for the further progression of Magnum Midstream NRC license.

1. You have requested a Cs-137 source to calibrate survey meters. I am assuming that the Cs-137 source will remain at your facility in Hickory, Pennsylvania and therefore will not need to be authorized on your NRC license for use at temporary job sites.

Question 1 Answer: The Cs-137 will remain at our facility located in Hickory, PA.

2. Please confirm that your training required in 10 CFR 34.42 and 34.43 will include address the requirements specified in 10 CFR 30.7 (Employee protection), 30.9 (Completeness and accuracy of information), 30.10 (Deliberate misconduct) and the applicable parts of 10 CFR 19 & 20 and a few questions from these parts will be included in your quizzes.

Question 2 Answer: Accompanying this letter are sample slides and question pertaining to the following inquiry. After my review of the radiation safety program I feel I can add additional information of part 30. I will start after I complete this letter.

3. Do you plan to or foresee the potential to perform source exchanges at temporary job sites?

Question 3 Answer: I do not plan on as of this time or foreseeable future performing any source exchanges on temporary job sites.

4. Please confirm that you will include in your procedures the applicable requirements in 10 CFR 19.11, Posting of notices to workers, and include the telephone number of the NRC's Operations Center (301-816-5100).

Question 4 Answer: I will add that information in our procedures.

If there are any additional information requirements please feel free to notify me as soon as you can by phone and/or email.

Thank you for your time and consideration

Warren Shook

5-28-2014

Warren Shook
RSO
Magnum Midstream
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Introduction

- Radiographer's most important responsibility is to implement safety procedures and regulations.
- **Make Safety a Habit!**
- Safety procedures are in place to protect the Radiographer, Assistant and the General Public
- Regulations to Follow:
- Safety and Emergency procedures of the employer ie: O&E Procedures.
- State and Federal Regulations

Discovery of Biological Effects of Radiation

- First noticed in 1896 just months after Rontgen's discovery.
- A Quality Factor is used to evaluate the radiation absorbed dose.

Table 3.1: Roentgen equivalent in man calculations.

Radiation Type	Rad	Q	Equivalent rem
 X-ray	1 (10 mSv)	1	1 (10 mSv)
 Gamma Ray	1 (10 mSv)	1	1 (10 mSv)
 Beta Particle	1 (10 mSv)	1	1 (10 mSv)
 Thermal Neutrons	1 (10 mSv)	5	5 (50 mSv)
 Fast Neutrons	1 (10 mSv)	10	10 (100 mSv)
 Alpha Particles	1 (10 mSv)	20	20 (200 mSv)

Types of Exposures

External

- Outside of Body
- Control by:
 - Time
 - Distance
 - Shielding

Internal

- Materials in body
 - Inhalation or ingestion
 - Through breaks in skin
- Control by:
 - Limiting contamination
 - Not eating in restricted areas

- Annual Occupational Dose limits of 10 CFR Part 20 Standards for Protection Against Radiation
- Annual Occupational Dose limits for minors are 10% of the occupational dose limits for adults
- Declared Pregnant Woman: According to 10 CFR Part 20 any women planning on becoming pregnant must in writing declare her intention. The occupational exposure of an embryo/fetus is 0.5 rem (5mSv).

Table 4.4: Maximum permissible dose values.

Controlled areas	Maximum Yearly Dose Sieverts (rem) ^a
Whole body, gonads, Lens of eye	0.05 (5) 0.15 (15)
Skin (other than hands and forearms)	0.50 (50)
Hands	0.50 (50)
Forearms	0.50 (50)
Other organs	0.50 (50)
Noncontrolled areas	0.001 (0.1)

^a The numerical value of the dose equivalent in rem may be assumed to be equal to the numerical value of the exposure in roentgen for the purpose of this report.

Radiation Detection Equipment

Survey Meters (Dose Rate)

- Measure immediate dose rates of ionizing radiation
- **First line of defense against overexposure**
- Aids in locating safe radiation level perimeters
- Survey meters used are the Geiger-muller type (gas-filled tubes)
- Geiger-muller very rugged, but may saturate if intensities are too high and produce a false zero reading
- Wet conditions can also effect a survey meter providing a false zero or a false reading of radiation
- Ion chamber survey meters are useful in the energy ranges typically associated with X-radiation and more accurate and stable at lower energies. Reliable with X-rays below 100 KeV

Steps to Limit Radiation Exposure

Three Basic Steps to limit Exposure

- 1) Decrease the time spent near radiation source
- 2) Increase the distance between personnel and radiation source
- 3) Utilize shielding

Time: Time spent within a given radiation area will determine the absorbed dose.

$$\text{Dose Rate} = \text{Dose} / \text{time}$$

$$\text{Time} = \text{Dose} / \text{Dose Rate}$$

$$\text{Dose} = \text{Dose Rate} \times \text{Time}$$

Gamma Ray Radiography

Personnel Monitoring Devices 10 CFR Part 34.47

- Pocket dosimeters calibration not to exceed 12 months \pm 20% of true radiation exposure, record of calibration kept for 3 years
- Event of possible over exposure film badge must be process within 24 hours
- Lost or damaged dosimetry, cease work until a replacement is received.
- All personnel dose records are to be kept until the commission terminates the license
- Rate alarming meters must be calibrated not to exceed 12 months, \pm 20% of true radiation dose rate. Dose rate is preset at 500 mR/h (5mSv/h)

Gamma Ray Radiography

Incident Reporting

- **Immediately report** or no later than 4 hours after discovery of an event that prevents immediate protective actions necessary to avoid exposures to radiation or radioactive materials that could exceed regulatory limits or releases of licensed material that could exceed regulatory limits. (theft, fire, explosion)
- **Report within 24 hours** of discovery an unplanned contamination, event of disabled or malfunction equipment, medical treatment of an individual with contaminated clothes or body, fire or explosion damaging any licensed material, device, container or equipment containing licensed material.

Gamma Ray Radiography

Transportation Requirements

- Highly regulated, NRC 10 CFR Part 71/Department of Transportation (DOT)
- DOT regulations for transport of radiography sources are DOT Hazardous Materials 49 CFR 171 through 179
- Radiography sources must be properly packaged for transportation. Special form or normal form?
- **Special Form:** the radioactive material is contained in a leak-proof capsule to prevent the spread of contamination.
- **Normal Form:** radioactive materials that are not given much protection against escape. (radiopharmaceuticals, waste materials)

United States Nuclear Regulatory Commission Regulations

- Part 19—Notices, Instructions and Reports to Workers: Inspection and Investigations
- Part 20— Standards For Protection Against Radiation
- Part 30—Rules of General Applicability to Domestic Licensing of Byproduct Material
- Part 34— Licenses For Industrial Radiography And Radiation Safety Requirements For Industrial Radiographic Operations
- Part 37— Physical Protection Of Category 1 and Category 2 Quantities Of Radioactive Material
- Part 71— Packaging And Transportation Of Radioactive Material

Part—20 Standards For Protection Against Radiation

- Subpart B— Radiation Protection Programs
- Subpart C— Occupational Dose Limits
- Subpart D— Radiation Dose Limits for Individual Members of the Public
- Subpart F— Surveys and Monitoring
- Subpart G—Control of Exposure From External Sources in Restricted Areas
- Subpart I— Storage and Control of Licensed Material
- Subpart J— Precautionary Procedures
- Subpart L— Records

1) Annual occupational dose limits are documented in what regulation?

- A. 10 CFR Part 71
- B. 10 CFR Part 20
- C. 10 CFR Part 37
- D. 10 CFR Part 19

1) Which instruments measure dose rate or the presence of radiation?

- A. Survey meter
- B. Pocket dosimeter
- C. Rate alarm meter
- D. Both A & C

2) Seal source leak test shall not exceed:

- A. 3 months
- B. 6 months
- C. 12 months
- D. No set time limit

1) You receive a dose of 30 mR with a total exposure time of 2.5 hours. What is the dose rate?

- A. 10 mR/hr
- B. 12 mR/hr
- C. 15 mR/hr
- D. 30 mR/hr

1) In the event that a possible over exposure may have taken place a film badge must be processed with in:

- A. 4 hours
- B. 12 hours
- C. 24 hours
- D. 36 hours

2) Daily inspections are not an essential part of radiation safety.

- A. True
- B. False

3) Regulations for transportation of radioactive materials are stated in 10 CFR Part:

- A. 19
- B. 20
- C. 34

D. 71

4) Radioactive source capsule used for radiography are classified as:

- A. Special form
- B. Normal form
- C. Low specific activity
- D. Naturally occurring radioactive materials

1) A card carrying radiographer must be in attendance for transportation of a radioactive source?

- A. True
- B. False

1) Which part has to do with the increased controls?

- A. 20
- B. 34
- C. 37
- D. 71