Donovan, Larry

From: Gary Robertson [grobertson@rtconnect.net]
Sent: Friday, December 03, 2010 11:41 AM
To: Donovan, Larry
Subject: RE: Radiation Safety Plan

Larry,

I received your email, having several other things on my schedule at this time this will take me more time to fix. Next week I will be gone all week at a conference and will not have a lot of time to work on it. The devices are not out on the road and our secured at this time not to be used until this is resolved. I will work at getting it taken care of ASAP.

Gary Robertson
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From: Donovan, Larry [mailto:Larry.Donovan@nrc.gov]
Sent: Wednesday, December 01, 2010 4:40 PM
To: Gary Robertson
Cc: Campbell, Vivian; Poston-Brown, Martha
Subject: RE: Radiation Safety Plan

Gary:

Marti and I both reviewed your radiation safety plan. There are lots of problems. I was disappointed in that the 10 CFR 30.34(i) requirements weren't explained more succinctly. Let me go through the plan so you can modify it accordingly.

Standards operating procedures

1. Transportation of equipment. In paragraph 1 you discussed locking the vehicle or van or securing the gauge to the vehicle bed. Where is there a discussion of the 2 independent barriers as discussed in 10 CFR 30.34(i)? You need to detail out explicit procedures and the difference between the security requirements in 10 CFR 30.34(i) and safety requirements in license condition 17.

2. You state in sentence 2, that the "USDOT requires that the gauge be transported in a properly labeled case." You need to specify what labels are to be affixed to the gauge case and if they get worn, unreadable or defaced, then they need to be replaced.

3. "Appropriate documentation , as required by NRC and DOT shall be kept on file and with the gauge at all times." What explicit documentation? And where? For example, Leak tests should be with the gauge inside the gauge

case but shipping papers need to be in arms reach of the driver, not in the case on the truck bed as I previously explained in my last email. You need to detail out specific procedures because in their current form they are too vague, almost like a Cliff Notes summary and would not suffice to explain what documents should be kept where. This is especially important for new employees.

Utilization procedures

1. Par 7. " When not taking measurements, the gauge shall be placed in the transportation case and returned to its permanent or temporary storage areas soon as possible." And then what? How is it to be secured? License condition 17 discusses locking the gauge case or gauge. What about security requirements under 10 CFR 30.34(i). The 2 independent barriers applies to both transport vehicles and permanent storage locations. You need to detail out specifics.

Emergency procedures

1. Para A. Please explain where you got 15 ft as your radius exclusion zone. Did you do a theoretical calculation or use a survey meter or what? Your license requires you to have a survey meter or have access to one. If there was an accident, say a flipped over truck how would you ascertain if there is a radiation issue?

2. How do you "assess contamination" as discussed in Para B?

ALARA program, Management Commitment goals.

1. Para 2. "Management will periodically perform a formal audit". At what frequency? 10 CFR 20.1101© requires an audit periodically (at least annually). But in para 4 it is stated that "management shall be committed to a review of radiation protection at least once every three years." As stated above the audit is required every year by the RSO and submitted to management for their review. Hazmat refresher training on the other hand is required once every three years. The annual audit by the RSO will be able to monitor this to ensure all workers get their training when required. A 3 year audit will miss staff hazmat refresher training and would be a violation of 10 CFR 20.1101© and 49 CFR 172.704. If you use the audit checklist form in NUREG 1556 volume 1, it is very comprehensive and will ensure you cover all salient points of the radiation safety program.

Procedures, Engineering Controls and process controls

Surveys and Monitoring. You state you will "perform surveys and monitoring sufficient to demonstrate compliance with the requirements of 10 CFR 20.1302." Please explain how you will do the surveys, e.g., theoretical assessment, use of a survey meter (do you have one and how often is it calibrated, or do you borrow one and from whom? Please provide the contact person where you have access, so we can verify you have a survey meter access program in place if you do not have your own survey meter?)

ALARA reviews. The frequency is correctly stated as annually. However, previously, in the management commitment goals para 4, it cites a 3 year frequency. Please explain.

NRC-CFR part 20 section, subpart D compliance with dose limits for individual members of the public 20.1302.

During the last inspection on January 15, 2008 you were cited for failure to do a public dose assessment. This was cited as a Severity level IV violation and when the form 591 was signed by Zack Wilkerson, he committed to doing the public dose assessment by using appendix I from 1556 Vol 1 within 30 days Please send us the public dose assessment to us for our review. You may send it in a email or fax it to us at 817-860-8263.

Para 3. "Instruments are calibrated periodically." Please specify the calibration frequency of your survey meter and evidence of the last 3 calibrations.

Subpart I Security of Stored Materials, ALARA para 3.

You discus the double locked system with a locked storage compartment within a locked building. As stated, it meets the requirements of 10 CFR 30.34(i) minimally, but consider this. I have personal experience from 3 recent inspections where I arrived on site during the lunch hour and the building was unlocked and no one was in the vicinity of the gauge and there was then only one lock. Result: escalated enforcement. Now if someone is in the building when we arrive as has happen too, then they can provide direct surveillance and all is OK. In another case the building was locked and so was the gauge vault, but the keys to the vault were hanging close by about a foot way effectively, rendering that security measure moot. Result: escalated enforcement. On the 3rd case I arrived on site during the late afternoon, all doors to the building were locked except one. I entered and walked into the building unchallenged. There was a worker in his office on the telephone looking away from me out the window. I was able to by pass him, saw the storage room, entered into a hallway and then found the storage vault which was locked. There was only one lock. Result: escalated enforcement. The point here is that you need to consider a double lock system inside the building and not rely solely on the building itself as one of the barriers. All it takes is for one person to forget to lock the building or the building to be un occupied say over lunch hour and we happen to arrive on site. Under the current enforcement policy one barrier is the same as no barriers and will result in escalated enforcement. Now, this requirement also applies on transport vehicles too as was the focus of the inspection in Greybull Wyoming this past September. Although the metal gauge case was locked to the truck bed effectively being as part of the truck, there was only one lock on the metal case vault that housed the gauge, if penetrated, then the gauge could be easily removed. You need to detail out how your trucks will be modified to ensure 2 independent barriers are in place before NRC will permit you to transport gauges in the future. This is your slow time and so you have ample opportunity to come up with a solution.

Transportation regulations.

Actually 10 CFR 71.5 is the tie in connection between NRC and DOT. Part 71.5 gives NRC the authority to inspect under 49 CFR. Either in this section or the aforementioned training section you should discuss the 3 year hazmat refresher training requirement under 49 CFR 172.704 (c) (2).

Please provide a time table on when you will submit:
(1) revised training manual;
(2) the information requested above and;
(3) when the all McGarvin-Moberly vehicles will be modified with a security system in place to ensure a 2 independent barriers system before transporting licensed material.

From: Gary Robertson [mailto:grobertson@rtconnect.net]
Sent: Tuesday, November 30, 2010 12:09 PM
To: Donovan, Larry
Subject: Radiation Safety Plan

Larry,

Attached is McGarvin-Moberly's Radiation Safety Plan. I hope this is what you were wanting. Please let me know. This plan will be implemented immediately and will be monitored by myself.

Gary Robertson
Environmental/Safety Director

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Attachments: Radiation Safety Plan.doc

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Radiation Safety Plan

STANDARD OPERATING PROCEDURES

Transportation of Equipment:

1. All possible means shall be provided to ensure that the equipment is fully secured in the transporting vehicle; and, the equipment is away from the passenger compartment. When transporting in an enclosed vehicle (car or van) the vehicle will be locked. When transporting in an open bed vehicle, the gauge should be securely fastened and locked to the truck bed.

2. The gauge will be transported in the manufacturer's transportation case. The U.S. Department of Transportation requires that the gauge be transported in a properly labeled carrying case.

3. The appropriate documentation, as required by the NRC and the DOT, shall be kept on file and with the gauge at all times.

Utilization Procedures:

1. Sign the gauge out in a log book including the date(s) of use, name(s) of the authorized users who will be responsible for the gauge, and the temporary jobsite(s) where the gauge will be used.

2. Before removing the gauge from its place of storage, check to make sure that the gauge source rod is in the shielded, locked position, then lock the transport case if possible.

3. When the gauge is in the field, you as the authorized operator must maintain control over the gauge at all times. The gauge must not be left unattended.

4. Always keep unauthorized persons away from the area where the gauge is to be used.

5. Always maintain constant surveillance and immediate control of the gauge when it is not in storage.

6. After each measurement, always return the source to the shielded position and lock it there.

7. When not taking measurements the gauge shall be placed in the transportation case and returned to its permanent or temporary storage area as soon as possible. Temporary storage areas at job sites can be temporary buildings, trailers, etc. that the Field Engineer uses as his Field Office. In the absence of a field office the gauge will be stored in the user's locked and secured vehicle.

8. To assist operators of heavy equipment in seeing gauges at construction sites, always "stake and flag" each gauge, being sure that the flags are tall enough to be seen by heavy equipment operators[1].

9. When using the gauge, the operator will wear the personal monitoring device that the user has been assigned. When not using the equipment, the monitoring device is to be stored in a radiation free area.

10. Never wear another person's TLD or film badge.

11. Never store your TLD or film badge near the gauge.

12. Do not touch the source rod with your fingers, hands, or any part of your body and always make sure the source rod is in the shielded position after each measurement is made.

13. Never look under the gauge when the source rod is being lowered into the ground.

14. Keep the source in the stored position and locked when not in use.

15. Always operate the gauge with the ALARA principle.

16. Return the gauge to its proper storage location at the end of the work shift.

17. When the gauge is returned to storage, so indicate in the source log.

Emergency Procedures.

1. If the source fails to return to the shielded position (e.g., as a result of being damaged) or if any other emergency or unusual situation arises (e.g., the gauge is struck by a moving vehicle, is dropped, or is in a vehicle involved in an accident):

    A. Immediately cordon off an area around the gauge. An area radius of 15' is sufficient.

    B. If a vehicle is involved, it must be stopped until the extent of contamination, if any, can be established.

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[1] A fiberglass whip with a flag at the top (available as a bicycle accessory) can be attached to the gauge to make its location more obvious to heavy equipment operators.

C. A visual inspection of the gauge is to be made to determine if the source housing and/or shielding has been damaged.

D. At the earliest possible time, when the situation is under control without leaving the gauge unattended, notify licensee management of the situation, calling company personnel in the order listed below:

NAME	WORK NUMBER	CELL NUMBER
Gary Robertson(RSO)	307-347-4268	307-431-6662

Describe the present conditions and follow the instructions of the Radiation Safety Officer.

2. In the event the gauge is lost or stolen, immediately notify the Radiation Safety Officer listed above.

These procedures are posted in the permanent storage, any temporary storage areas, transport vehicles, as well as with the gauge paperwork. The Radiation Safety Program, the ALARA Program, and other pertinent sections of the NRC Rules and Regulations are posted in numerous areas where the gauges are stored, maintained, and operated. All personnel operating the gauges have been required to read and acknowledge the following documents:

1. The NRC License
2. ALARA Program
3. Radiation Safety Program
4. McGarvin-Moberly Construction Co. operating and emergency procedures

ALARA PROGRAM

Means making every reasonable effort to maintain exposures to radiation as far as below the dose limits in this part as is practical consistent with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed materials in the public interest.

GENERAL

This program is to fulfill the requirements of PART 20 "Standards for Protection against Radiation". In particular, establish an ALARA program. This response shall be maintained and updated as required by Part 20; "Standards for Protection against Radiation" and our materials license. MCGARVIN-MOBERLY CONSTRUCTION CO. shall develop, document and implement this ALARA program commensurate with the scope and extent of licensed activities and sufficient to ensure compliance with the provisions noted.

MCGARVIN-MOBERLY CONSTRUCTION CO. shall use, to the extent practicable, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are **A**s **L**ow **A**s **R**easonably **A**chievable(**ALARA).** Two basic conditions are necessary to keep exposures as far below the specified limits as is reasonably achievable. McGarvin-Moberly Construction Co. Management shall be committed to maintaining this philosophy and the personnel responsible for radiation protection shall be continually vigilant for means to reduce exposures.

MCGARVIN-MOBERLY CONSTRUCTION CO. shall implement this program in addition to a radiation protection program that controls dose rates in unrestricted areas to maintain overall doses to workers and members of the public ALARA below the limits in 10 CFR Part 20. In addition, the sum of the doses received by all exposed individuals shall be maintained at the lowest practicable level.

Radiation protection programs that have been established under the requirements of 10 CFR parts 33 and 35 will be considered to be acceptable to meet the occupational ALARA requirements of the revised 10 CFR part 20 when the program activities are limited to external occupational exposures.

McGarvin-Moberly Construction Co. use of radioactive sources, companywide, is limited to external exposure.

McGarvin-Moberly Construction Co. ALARA program to control occupational doses and doses to members of the public shall contain the following program elements;

Management Commitment to ALARA, Including Goals

The single most critical aspect of successfully achieving ALARA in the radiation safety program, is the commitment of management to maintain doses ALARA, both occupational and to the public. The commitment made by MCGARVIN-MOBERLY CONSTRUCTION CO. Management to minimize exposures shall provide clearly defined radiation protection responsibilities and an environment in which the radiation protection staff can do its job properly. There are several aspects to this commitment:

1. **MCGARVIN-MOBERLY CONSTRUCTION CO. personnel shall be made aware of management's commitment to keep occupational exposures as low as is reasonably achievable.** The commitment shall appear in policy statements such as McGarvin-Moberly Construction Co. procedures manuals, NRC rules and regulations, and similar documents. MCGARVIN-MOBERLY CONSTRUCTION CO. personnel shall be sufficiently familiar with this commitment that they can explain what the management commitment is, what "ALARA" means, why it is recommended, and how they have been advised to implement it on their jobs.

2. **Management shall periodically perform a formal audit to determine how exposures might be lowered.** This shall include reviews of operating procedures and past exposure records, laboratory and onsite inspections, and consultations with the radiation protection staff or outside consultants. At a minimum, management shall be able to discuss which operating procedures were reviewed, in which location most exposures are being received, what groups of workers are receiving the highest exposures, what discussions they have had with the radiation protection staff or outside consultants, and what steps they have taken to reduce exposures.

3. **The management shall ensure that there is a well-supervised radiation protection capability with well-defined responsibilities.** The qualifications for the Radiation Safety Officer are presented in McGarvin-Moberly Construction Co. application for license renewal. The qualifications selected are commensurate with the potential problems anticipated to be encountered in our licensed activities. The Radiation Protection Staff will include, at a minimum, one designated individual from each office or facility where the gauges are stored, responsible for overseeing radiation safety and practices within that particular office.

4. **The management shall see that the personnel receive sufficient training.** CFR Part 19 requires instruction of personnel on radiation protection. The radiation worker shall understand how radiation protection relates to his job and should be tested on this understanding at least once per year. He shall have frequent opportunities to discuss radiation safety with the radiation protection staff whenever the need arises. Management shall be committed to a review of radiation protection at least once every three years. Training shall be sufficient to ensure that the workers can correctly answer questions on radiation protection as it relates to their jobs.

5. **The RSO shall be given sufficient authority to enforce safe operation.** The RSO shall have the authority to prevent unsafe practices and to communicate promptly with an appropriate level of management about halting an operation he deems unsafe. Operating procedures related to radiation safety shall be reviewed and approved by radiation protection personnel on both the corporate and office levels. This authority shall be demonstratable by written policy statements.

6. **Modifications to operating and maintenance procedures and to equipment and facilities shall be made where they will substantially reduce exposures at a reasonable cost.** The management shall be able to demonstrate that improvements have been *sought*, that modifications have been considered, and that they have been implemented where practicable. Where modifications have been considered but not implemented, MCGARVIN-MOBERLY CONSTRUCTION CO. shall be prepared to describe the reasons for not implementing them.

Vigilance by the RSO and the Radiation Protection Staff

It shall be the responsibility of the RSO and the radiation protection staff, corporate wide, to conduct surveillance programs and investigations to ensure that occupational exposures are as far below the specified limits as is reasonably achievable. Additionally, they shall be vigilant in searching out new and better ways to perform all radiation jobs with less exposure. There are several aspects to this responsibility.

1. **The RSO and the radiation protection staff shall know the origins of radiation exposures in the facility.** They shall know these by location, operation, and job category and shall be aware of trends in exposures. The RSO and the radiation protection staff shall be able to describe which locations, operations, and jobs are associated with the highest exposures and why exposures are increasing or decreasing.

2. **The RSO and the radiation protection staff shall look for ways to reduce exposures.** When unusual exposures have occurred, the radiation protection staff shall direct and participate in an investigation of the circumstances of such exposures to determine the causes and take steps to reduce the likelihood of similar future occurrences. For each such

occurrence, the RSO shall be able to demonstrate that such an investigation has been carried out, that conclusions were reached as a result of the investigation, and that corrective action was taken, as appropriate.

The RSO and the radiation protection staff shall periodically review operating procedures that may affect radiation safety and survey operations and techniques to identify situations in which exposures can be reduced. Indicated changes shall be promptly implemented. Procedures for receiving and evaluating suggestions relating to radiation protection from employees shall be established. Workers shall be knowledgeable of the procedures for making suggestions on radiation protection.

3. **Adequate equipment and supplies for radiation protection work shall be provided.** The RSO shall be responsible for ensuring that proper equipment and supplies are available, are maintained in good working order, and are used properly. Written procedures or the use of the equipment shall be available and followed.

   To assist in demonstrating compliance with the requirements of 10 CFR Part 20, MCGARVIN-MOBERLY CONSTRUCTION CO. has set ALARA goals for exposure limits at a modest fraction of the maximum specified values. Establishing a goal is not intended as setting a precedent or a de facto limit. Goals may need to be adjusted up or down on the basis of the annual review of what may be ALARA for the particular circumstance. MCGARVIN-MOBERLY CONSTRUCTION CO. chooses to demonstrate compliance with 10 CFR Part 20.1301 through a calculation of the total effective dose equivalent (TEDE) to the individual likely to receive the highest dose. See MCGARVIN-MOBERLY CONSTRUCTION CO. ALARA under Subpart C Occupational dose limits for adults; 20.1201.

   MCGARVIN-MOBERLY CONSTRUCTION CO. will not assume worst case models when calculating dose but rather shall make assumptions that will result in realistic estimates of actual dose received by the member of the public likely to receive the highest dose.

Procedures, Engineering Controls, and Process Controls

McGarvin-Moberly Construction Co. Radiation Safety Officer shall be responsible for setting, adjusting, and periodically reviewing the radiation protection program and the ALARA goals.

Surveys and Monitoring

MCGARVIN-MOBERLY CONSTRUCTION CO. shall perform surveys and monitoring sufficient to demonstrate compliance with the requirements of 10 CFR part 20.1302. This includes the monitoring and surveys that may be necessary to determine whether radiation levels meet the

licensees established ALARA goals. These surveys shall include surveys of dose rates in unrestricted areas.

ALARA Reviews

According to 10 CFR part 20.1101(c), the content and implementation of the radiation protection programs, which shall include this ALARA program, shall be reviewed at least annually. This review shall include analysis of trends in concentrations and radionuclide usage as well as other available monitoring data. The review shall provide a documented basis for determining whether changes are needed in systems or practices to achieve ALARA goals. In addition, MCGARVIN-MOBERLY CONSTRUCTION CO. shall review all modifications of the ALARA program to ensure compliance with 10 CFR Part 20.1101(b).

Worker Training

Specific training on ALARA shall be provided as part of the annual employee radiation protection training (see 10 CFR 19.12). For an ALARA program to be successful, employees must understand the ALARA goals and principles. The radiation protection staff shall be available to help clarify the ALARA policy and its goals and to assist employees both during training and throughout the year.

NRC-CFR PART 20; STANDARDS FOR PROTECTION AGAINST RADIATION,

Subpart A General Provisions; 20.1002 Scope, Para 1

The limits in this part do not apply to doses due to background radiation, to exposure of patients to radiation for the purpose of medical diagnosis or therapy, or to voluntary participation in medical research programs.

Subpart B Radiation Protection Programs; 20.1101

1. MCGARVIN-MOBERLY CONSTRUCTION CO. has developed, documented, and implemented a radiation protection program commensurate with the scope and extent of licensed activities and sufficient to ensure compliance with the provisions of this part. (See 20.2102 for record keeping) MCGARVIN-MOBERLY CONSTRUCTION CO. has incorporated a radiation protection program that is included in McGarvin-Moberly Construction Co. materials license.

2. MCGARVIN-MOBERLY CONSTRUCTION CO. shall use, to the extent practicable, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are as low as reasonably achievable(ALARA).

3. MCGARVIN-MOBERLY CONSTRUCTION CO. shall periodically (at least annually) review the radiation protection program content and implementation. This review shall be performed by the radiation protection staff.

Subpart C Occupational Dose Limits For Adults; 20.1201

1. MCGARVIN-MOBERLY CONSTRUCTION CO. shall control the occupational dose to individual adults to the following dose limits.

   A. An annual limit, which is the more limiting of:
      (i) The total effective dose equivalent being equal to 5 rems (0.05 Sv) or
      (ii) The sum of the deep-dose equivalent and the committed dose equivalent to any individual organ or tissue other than the lens of the eye being equal to 50 rems. (0.5 Sv)

   B. The annual limits to the lens of the eye, to the skin, and to the extremities, which are:
      (i) An eye dose equivalent of 15 rems (0.15 Sv) and
      (ii) A shallow-dose equivalent of 50 rems (0.50 Sv) to the skin or to any extremity.

McGarvin-Moberly Construction Co. use of radioactive materials is limited to external exposure and the total effective dose equivalent of 5 rems (0.05 Sv) is the most limiting dosage, due to the type of equipment used. McGarvin-Moberly Construction Co. ALARA goals for operating nuclear gauges shall be according to the following table:

Distance From Gauge Feet	Maximum Time/Day hours	Exposure Rate Mrem/hour	Total Exposure, Mrem/Day
0	0.1	10	1.0
1	1.4	1.5	2.10
3	2.0	0.5	1.0
10	6.5	.1	0.65
Total	10		4.75

Assuming a maximum number of 300 work days/year, this would limit the Total Effective Dose Equivalent to 1.425 rem/year or 28% of the 5 rem allowable.

1. Doses received in excess of the annual limits, including doses received during accidents, emergencies, and planned special exposures, shall be subtracted from the limits for planned special exposures that the individual may receive during the current year.

ALARA

McGarvin-Moberly Construction Co. use of radioactive equipment does not require the need for "Planned Special Exposures" and therefore will not be considered nor documented.

2. The assigned deep-dose equivalent and shallow-dose equivalent must be for the part of the body receiving the highest exposure. The deep-dose equivalent, eye dose equivalent and the shallow-dose equivalent may be assessed from surveys or other radiation measurements for the purpose of demonstrating compliance with the occupational dose limits, if the individual monitoring divide was not in the region of the highest potential exposure, or the results of individual monitoring are unavailable.

3. MCGARVIN-MOBERLY CONSTRUCTION CO. shall reduce the dose that an individual may be allowed to receive in the current year by the amount of occupational dose received while employed by any other person.

Subpart C Occupational Dose Limits For Minors; 20.1207

The annual occupational dose limits for minors are 10 percent of the annual dose limits specified for adult workers in 20.1201.

ALARA

MCGARVIN-MOBERLY CONSTRUCTION CO. shall not allow a minor (Under 18) to receive occupational doses. Minors shall be assigned duties other than those associated with occupational radiation exposure.

Subpart C Dose To An Embryo/Fetus; 20.1208

1. MCGARVIN-MOBERLY CONSTRUCTION CO. shall ensure that the dose to an embryo/fetus during the entire pregnancy, due to occupational exposure of a declared pregnant woman, does not exceed 0.5 rem (5 mSv).

2. MCGARVIN-MOBERLY CONSTRUCTION CO. shall make efforts to avoid substantial variation above a uniform monthly exposure rate to a declared pregnant woman so as to satisfy the limit in paragraph (a) of this section.

ALARA

MCGARVIN-MOBERLY CONSTRUCTION CO. shall not allow a declared pregnant woman to receive occupational doses during the pregnancy period. A declared pregnant woman shall be assigned duties other than those associated with occupational radiation exposure.

Subpart D Compliance With Dose Limits For Individual Members Of The Public; 20.1302

1. MCGARVIN-MOBERLY CONSTRUCTION CO. shall show compliance with the annual dose limit in 20.1301 by:

- Demonstrating by measurement or calculation that the total effective dose equivalent to the individual likely to receive the highest dose from the licensed operation does not exceed the annual dose limit of 0.1 rem(1 mSv); and

- If an individual were continuously present in an unrestricted area, the dose from external sources would not exceed 0.002 rem (0.02 mSv) in any one hour.

ALARA

2. Individual members of the public shall not be allowed in restricted areas.

3. Individual members of the public should be kept at a distance not within 10' of the gauge. By keeping the public at this distance, the TEDE exposure rate will typically be less than 0.1 mrem/hour, which is less than 10% of the 2 mrem allowed. This 10' radius shall be considered the operating area.

Subpart F Surveys and Monitoring; 20.1501

1. MCGARVIN-MOBERLY CONSTRUCTION CO. shall make or cause to be made, as appropriate, surveys of radiation levels in unrestricted areas to demonstrate compliance with the dose limits for individual members of the public shown above. These surveys shall be that:

- May be necessary for MCGARVIN-MOBERLY CONSTRUCTION CO. to comply with the regulations in Part 20; and
- Are reasonable under the circumstances to evaluate;
  - (i)The extent of radiation levels; and
  - (ii)Concentrations or quantities of radioactive material; and
  - (ii)The potential radiological hazards that could be present.

2. MCGARVIN-MOBERLY CONSTRUCTION CO. shall ensure that instruments and equipment used for quantitative radiation measurements are calibrated periodically for the radiation measured.

3. All personnel dosimeters that require processing to determine the radiation dose and that are utilized by MCGARVIN-MOBERLY CONSTRUCTION CO., must be processed and evaluated by a dosimetry processor:

- 1)Holding current accreditation from NVLAP or NBS.
- Approved in this accreditation process for the type of radiation or radiations included in the NVLAP program that most closely approximate the type of radiation or radiations for which the individual wearing the dosimeter.

ALARA

MCGARVIN-MOBERLY CONSTRUCTION CO. shall monitor and conduct surveys to determine whether radiation levels meet the established ALARA goals. These surveys shall include personnel occupational doses, public doses, and unrestricted areas.

Subpart F Conditions Requiring Individual Monitoring of External and Internal Occupational Doses; 20.1502

MCGARVIN-MOBERLY CONSTRUCTION CO. shall monitor exposures to radiation and radioactive material at levels sufficient to demonstrate compliance with the occupational dose limits of this part.

ALARA

MCGARVIN-MOBERLY CONSTRUCTION CO. shall monitor **all** personnel receiving radiation from occupational exposure.

Subpart G Control of Exposure from External Sources in Restricted Areas; 20.1601

MCGARVIN-MOBERLY CONSTRUCTION CO. shall ensure that each entrance or access point to a restricted area has one or more of the following features:

1. A control device that energizes a conspicuous visible or audible alarm signal so that the individual entering the high radiation area and the supervisor of the activity are made aware of the entry; or

2. Entryways that are locked, except during periods when access to the area is required, with positive control over each individual entry.

ALARA

MCGARVIN-MOBERLY CONSTRUCTION CO. Management and the Radiation Protection Staff shall maintain control of access to the restricted (storage) areas.

Subpart I Security of Stored Material; 20.1801

MCGARVIN-MOBERLY CONSTRUCTION CO. shall secure from unauthorized removal or access licensed materials that are stored in unrestricted areas.

ALARA

1. MCGARVIN-MOBERLY CONSTRUCTION CO. shall not declare a controlled area.

2. MCGARVIN-MOBERLY CONSTRUCTION CO. shall not store licensed materials in an unrestricted area.

3. MCGARVIN-MOBERLY CONSTRUCTION CO. shall provide, at a minimum, a double lock system. This shall be accomplished by a locked storage compartment within a enclosure or building that can be locked also.

4. The gauges shall be stored not less than 15' from a permanent work station or other work stations where the TEDE exposure rate may exceed 0.1 mrem/hour.

Subpart L Records of Radiation Protection Programs; 20.2102

MCGARVIN-MOBERLY CONSTRUCTION CO. shall maintain records of the radiation protection program and the **ALARA** program including;

- Provisions of the programs, and

- Audits and other reviews of the program content and implementation.

MCGARVIN-MOBERLY CONSTRUCTION CO. shall retain the records required by this part until the Commission terminates each pertinent license requiring the record. Records shall be retained for 3 years after the record is made.

Subpart L Records of Surveys; 20.2103

MCGARVIN-MOBERLY CONSTRUCTION CO. shall maintain records showing the results of surveys and calibrations required by 20.1501 and 20.1906. These records shall be maintained for 3 years after the record is made.

MCGARVIN-MOBERLY CONSTRUCTION CO. shall retain each of the following records;

1. Records of the results of surveys to determine the dose from external sources.

ALARA

MCGARVIN-MOBERLY CONSTRUCTION CO. shall obtain and retain records of the results of measurements and calculations used to determine exposure adjacent to and in restricted areas.

MCGARVIN-MOBERLY CONSTRUCTION CO. shall obtain and retain records of the results of measurements and calculations used to determine exposure adjacent to and at personnel work stations near storage and restricted areas.

Transportation Regulations; 10 CFR Part 71.0

This part establishes; requirements for packaging, preparation for shipment, and transportation of licensed material; and procedures and standards for NRC approval of packaging and shipping procedures.

The regulations in this part apply to MCGARVIN-MOBERLY CONSTRUCTION CO., authorized by specific license issued by the commission to receive, possess, use, or transfer licensed material to a carrier for transport of transports the material outside the confines of McGarvin-Moberly Construction Co. facilities or other authorized place of use. No provision of this part authorizes possession of licensed material.

MCGARVIN-MOBERLY CONSTRUCTION CO. transports licensed packages in company vehicles and must provide for adequate blocking, bracing, or tie-down of the packages to prevent shifting or movement during normal transport. MCGARVIN-MOBERLY CONSTRUCTION CO. is also required to provide security measures adequate to prevent the unauthorized removal of the materials from the place of storage during transport pursuant to 10 CFR 20.207. This may involve locking the packages within an external, permanently attached compartment of the vehicle, or within the cargo compartment itself. The transportation compartment shall be secured in such a way unauthorized removal will be thwarted by means of an extra chain, or other similar device.

ALARA

MCGARVIN-MOBERLY CONSTRUCTION CO. shall provide transport provisions that maintain exposure rates ALARA. For example, if the transport vehicle is a pickup truck, the transport container shall be fastened as far away from the cab of the truck as possible.

In addition, the "approved" shipping container shall be locked, fastened, and braced to prevent loss or removal.

IMPLEMENTATION

Implementing and maintaining the policies of this program and the radiation program is imperative in order to maintain our materials license, protect our personnel, and protect the general public. The Radiation Safety Officer and the Radiation Protection Staff shall be responsible for initiating, implementing, adjusting, documenting, and monitoring the programs. However, the practices and performance of MCGARVIN-MOBERLY CONSTRUCTION CO. management and personnel is the key to maintaining and effective ALARA program.

According to 10 CFR 20.1101(c), the content and implementation of the radiation protection and ALARA programs must be reviewed at least annually. This review shall include analysis of trends in concentrations and radionuclide usage as well as other available monitoring data. The review shall provide a documented basis for determining whether changes are needed in systems or practices to achieve ALARA goals. The results of ALARA reviews shall be reported to management along with recommendations for changes in facilities or procedures that are deemed necessary to achieve ALARA goals.

In order to avoid an ineffective program, there are a number of common weaknesses to avoid:

1. Lack of Management Involvement
2. Insufficient Involvement from affected staff
3 Radiation Safety Officer Preoccupied
4. Inappropriate Delegation of Authority
5. Failure to Perform Audits
6. Rubber Stamp Approvals

Even though McGarvin-Moberly Construction Co. current occupational use of radioactive materials provide a very low risk of injury, it is prudent to avoid unnecessary exposure to radiation. The objective is thus to reduce occupation exposures as far below the specified limits as is reasonably achievable by means of good radiation protection planning and practice, as well as by management commitment to policies that foster vigilance against departures from good practice.