



## MISSOURI BASIN POWER PROJECT

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### LARAMIE RIVER STATION

Operating Agent  
Basin Electric Power Cooperative

Phone: 307-322-9601

P.O. Box 489  
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January 22, 2010

United States Nuclear Regulatory Commission  
Region IV  
612 East Lamar Boulevard Suite 400  
Arlington, TX 76011-4125

David Cummings, RSO  
Unit 3 Feeder Deck Incident – REVISED SUPPLEMENTAL REPORT  
NRC License #33-18224-01  
RE: Report #030-14682/2009-001

### Background Information

The Laramie River Station (LRS), located in Wheatland, WY, operates 216 industrial gauges for the purpose of operational control measuring flow, level, or density, and use Cs137 as the source. The Radiation Safety Officer is David Cummings. Credentials have been submitted to James Thompson, NRC, under separate cover. Several Instrument Technicians and Laboratory staff are designated as radiation workers at LRS, and given training annually regarding the work they perform related to nuclear gauges. This training typically covers general radiation safety, and includes specific training for leak checks, shutter checks and shutter closures. All other employees are considered to be Members of the Public (MOP) under the LRS Radiation Safety Program.

A Member of the Public exposure event occurred during the month of September 2009 that has been previously documented in the report dated October 20, 2009. Further information related to the incident is provided in this report.

### Root Cause (Initial Investigation)

Three root causes of the incident were identified:

1. Labels: Gauge labeling was insufficient to inform employees of the presence of radioactive material and subsequent possibility of exposure.
2. Lockout/Tagout: The clearance procedure was inadequate in that it failed to identify the need to shutter and lock the gauge for the purpose of preventing an exposure;
3. Training: The belief that shutter "automatically" closed, when combined with the unauthorized moving of the SeCoal arm for a function other than what the employee had been trained indicate that employee training contributed to this incident.

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Incident Resolution (Initial Investigation)

The following actions have been taken to prevent this type of incident from occurring again:

1. Labels: Labels have been installed on all SeCoal arms. Labels were reviewed for all other gauges on site, and improvements made as needed.
2. Lockout/Tagout: The clearance procedure has been modified to require SeCoal gauge shutters be closed, locked and tagged when ANY work is performed relative to the coal chutes or SeCoals.
3. Training: Additional training has been provided to the Mechanic/Welder, Instrument, Laboratory and Electrical shops regarding work around nuclear gauges. These sessions were conducted on October 5, 9, and 13, 2009. The Annual Radiation Safety Training for all personnel was held on October 29, 2009. These sessions were videotaped so all personnel unable to attend were able to view the session as well.

Further Actions Subsequent to the October 20, 2009 Report

The following work had not been completed at the time of the initial report. Included is a description of additional findings and actions that have been completed.

1. *Region IV of the Nuclear Regulatory Commission is investigating this incident. LRS will implement any additional changes as required by the NRC.*

Further investigation by James Thompson and myself found that additional employees were involved in the incident. Appendix 1 contains a table of individual dose calculations that has been corrected to include the additional individuals and their calculated dose. The additional employees involved in the incident did not receive an exposure greater than the Member of the Public limit.

A question was also raised regarding the original design of the SeCoal device itself, regarding its design allowing the gauge to be moved and create the possibility of an exposure. It was determined to the best knowledge of the Laramie River Station personnel, that the design of the SeCoal is original and has not been modified since its installation at construction. Mr. Thompson expressed interest in visiting other stations with similar equipment to investigate this design flaw. The Laramie River Station staff is continuing to investigate alternatives to improve the design, as an engineered solution to prevent an exposure would be superior to the current administrative controls in place. To date an adequate solution has not been determined.

2. *Wyoming OSHA is also investigating the incident. Additional changes may be implemented as required by WY OSHA.*

WY OSHA has declined to pursue their investigation related to the exposure pending the outcome of the NRC investigation. As related to nuclear gauges, WY OSHA has cited the Laramie River Station for inadequate Job Safety Analysis documentation and training. The Safety Coordinator of the Laramie River Station is responsible to address their concerns, along with the plant superintendants. The Radiation Safety Officer is participating in the revisions to JSAs as they relate to nuclear gauges.

- 3. Training: Annual Radiation Safety training will be conducted on October 29 with all plant personnel. This was scheduled in January 2009 by the Safety Training Coordinator and while this incident will be used as the basis for this training, it is not in response to the incident.*

In addition to the training already undertaken as previously reported, 'on-the-job' training has occurred several times. As this is typically informal and not documented, it has occurred with individuals across all job descriptions and is in response to specific questions that they have. The next 'formal' training sessions will be scheduled in the spring of 2010 for gauge users (operators, lab staff and instrument technicians) and in October 2010 for annual training for all employees.

- 4. Employee dose assessment reports: Each employee potentially affected by the incident will have a letter placed in their permanent file defining the dose received as a result of this incident as determined by myself and/or the NRC.*

Dose assessments were reviewed by Mr. Thompson and myself. Errors were discovered to the initial reported dose calculations in Appendix 1 and corrected on December 16, 2009. See Appendix 1 for the corrected dose information. The corrected dose information resulted in slightly higher exposures to several individuals than was previously determined.

Letters notifying affected employees of their individual dose were prepared on December 17, 2009 and mailed on December 21, 2009 to the employee's address on file with the Human Resource department. At the time of mailing, a copy of this letter was also placed in the medical file for each employee by the Human Resource manager. Employees were invited via email to preview the letter and to discuss any questions or concerns they may have. A few of the employees have had specific questions which have been addressed at the time of their inquiry.

- 5. Procedural Review: LRS will be evaluating the clearance procedures for other equipment where a nuclear gauge is in use, to determine the effectiveness of the procedure for isolating the gauge. Deficiencies will be noted and corrected as appropriate.*

During the ongoing investigation, the Gauge Operation Procedure was reviewed. The Laramie River Station operates three base-load coal fired units which essentially are "always" on-line. However, during times of an extended outage the Procedure was found to be inadequate in that it did not take into consideration that the potential for exposure is increased due to equipment being shut down and unusual work being done. The procedure has been modified as of December 18, 2009 to include a shutter closure with a lock applied for all gauges affected by an extended outage (see Appendix 2).

Gauges have been inspected in other locations and it has been determined that the opportunity for a similar event is unlikely, as only the SeCoal gauges have the mobile mount.

LRS Unit 3 Feeder Deck Incident  
Revised Supplemental Report  
January 22, 2010  
Page 4

Please do not hesitate to contact me if I can provide further information.

Sincerely,

A handwritten signature in black ink, appearing to read 'David Cummings', written in a cursive style.

David Cummings  
Radiation Safety Officer  
Laramie River Station

Attachment

cc: B. Larson, LRS  
B. Eriksen, HQ  
lf

Appendix 1. Individual Dose Calculations (REVISED 12/16/2009)

Table I. Time Spent Working in Exposure Area per SeCoal Arm Position, per Employee Interview (hours).

Employee	Operational	Full	Calibrate	Open	Total
A	1	1	0	0	2
B	0	1	1	0	2
C	0	1	2	8	11
D	0	1.5	1.5	0	3
E	0	1	0	0	1
F	0	1	1	0	2
G	0	0	0	6	6
H	0	0	2	2	4
I	0.5	0	0.5	0	1
J	18	1	0	6	25
K	0	2	0	3	5
L	0	0	0	1	1
M	4	0	0	0	4
N	9	9	9	9	36
O	0	0	0	0	0
P	1	1	0	0	2
Q	0	1	1	0	2

Table II. Survey Results at One Foot from Gauge (mR/hr)

	3B SeCoal <sup>1</sup>	1C SeCoal <sup>2</sup>	Average
Operational	0	0	0
Full	3.0	1.5	2.3
Calibrate	6.0	13	9.5
Open	60	60	60

<sup>1</sup>3B Readings taken by K. Yergler on 9/29/09, 9:00 am.

<sup>2</sup>1C Readings taken by D. Cummings on 10/12/09, 2:00 pm.

Table III. Dose Calculations for Employees (mR), At SeCoal Arm Positions as Indicated and the Total for All Positions.

Employee	Operational	Full	Calibrate	Open	Total
A	0	2.3	0	0	2.3
B	0	2.3	9.5	0	11.8
C	0	2.3	19	480	501.3
D	0	3.45	14.25	0	17.7
E	0	2.3	0	0	2.3
F	0	2.3	9.5	0	11.8
G	0	0	0	360	360
H	0	0	19	120	139
I	0	0	4.75	0	4.75
J	0	2.3	0	360	362.3
K	0	4.6	0	180	184.6
L	0	0	0	60	60
M	0	0	0	0	0
N	0	20.7	85.5	540	646.7
O	0	0	0	0	0
P	0	2.3	0	0	2.3
Q	0	2.3	9.5	0	11.8

Appendix II. Supplemental Attachments.

MISSOURI BASIN POWER PROJECT  
BASIN ELECTRIC POWER COOPERATIVE  
LARAMIE RIVER STATION

**>>CONFIDENTIAL<<**

DATE: DECEMBER 21, 2009

TO:

Employee Number:

As a result of work performed on the Unit 3 SeCoal chute modification during the summer of 2009, you received a calculated dose of XXXX millirems from a Cesium-137 point source of gamma radiation. This dose has been reported to the Nuclear Regulatory Commission.

Under the Radiation Safety Program of the Laramie River Station, you are considered a Member of the Public. The United States Nuclear Regulatory Commission (NRC) sets a dose limit of not more than 100 millirems annually for Members of the Public. For comparative purposes, the NRC permits a person classified as a radiation worker to receive a dose of 5,000 millirems annually. The Occupational Safety and Health Administration (OSHA) sets an occupational exposure limit to industrial radiation sources at 5,000 millirems annually, spread evenly over four quarters (1,250 millirems allowable per quarter). A copy of this letter has been placed in your permanent employee file. Please do not hesitate to contact me if you have further questions.

Sincerely,

David Cummings  
Radiation Safety Officer

Cc: Employee Personnel File

## GAUGE OPERATION PROCEDURE

This procedure is to be used for the routine operation of nuclear gauges at the Laramie River Station.

### PROCEDURE

1. The device is to be installed per all federal regulations, according to the instructions provided by the manufacturer. **THE SHUTTER IS TO REMAIN CLOSED AND LOCKED AT ALL TIMES DURING INSTALLATION!**
2. After installation, an initial survey shall be conducted using the Leak Check Procedure by the RSO or other qualified individual to determine no leakage of material has occurred.
3. The lock will be removed from the shutter and proper shutter operation will be verified using the Shutter Check Procedure. **NOTE: VERIFY PROPER ALIGNMENT OF THE SHUTTER AND DETECTOR PRIOR TO OPENING OF THE SHUTTER!** Make certain no individuals are in the path of the source while this is being performed!
4. Perform necessary calibrations, adjustments, etc. to the instrument electronics.
5. Once the Instrument Department has put the gauge into service, notify Operations following standard procedure.
6. The gauge shutter is to be closed and locked at the beginning of an extended outage when widespread maintenance activities will be occurring with the increased risk of exposure for MOP personnel. The RSO will verify the closure of shutters during times of extended outage and maintain appropriate records. At the conclusion of the outage, the gauge will be returned to service according to normal startup procedures.

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Radiation Safety Officer