

U. S. NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT  
REGION IV

IE Inspection Report No. 50-298/79-08

License No. DPR-46

Licensee: Nebraska Public Power District (NPPD)

Docket No. 50-298

Facility: Cooper Nuclear Station (CNS)

Inspection Conducted: April 30 - May 4, 1979

Inspectors: Blaine Murray By GDBrown  
Blaine Murray, Radiation Specialist

5/30/79  
Date

Charles Cain  
Charles Cain, Radiation Specialist

5/29/79  
Date

Approved by: Glen D. Brown  
Glen D. Brown, Chief, Fuel Facility and  
Material Safety Branch

5/30/79  
Date

Inspection Summary

Inspection on April 30 - May 4, 1979 (Report No. 50-298/79-08)

Areas Inspected: (1) Routine, announced Radiation Protection inspection during refueling activities including radiation protection procedures, advanced planning and preparation, radiological training, exposure control, respiratory protection program, posting and controls, audits performed by the licensee, survey results, plant tours, independent measurements made by the inspector, radioactive and contaminated material control, follow-up action on previously identified items; and (2) analytical measurement results. The inspection involved sixty-four (64) hours by two (2) NRC inspectors.

Results: No items of noncompliance or deviation were identified.

510 004

7907190049

Details1. Persons Contacted (NPPD)

\*L. C. Lessor, Station Superintendent  
 J. V. Sayer, Chemistry and Health Physics Supervisor  
 R. W. Seir, QA Specialist  
 R. J. McDonald, Health Physicist  
 J. R. Warren, Radiochemist  
 W. F. Gilbert, Training Coordinator  
 R. Brungardt, Shift Supervisor

\*Denotes those attending the exit interview.

2. Scope of Inspection

The purpose of this inspection was to review the licensee's Radiation Protection Program, including refueling activities, for the period April 1, 1978, through April 30, 1979, and documentation of the analytical measurement results.

3. Advanced Planning and Preparation

The inspectors examined the licensee's program for providing advanced planning and preparation by the Health Physics staff. The Chemistry and Health Physics Supervisor stated that he is provided sufficient advanced information regarding work involving radiation control to enable proper planning and preparation by the Health Physics staff. The inspectors also examined the inventory of supplies and equipment.

No items of noncompliance or deviations were noted.

4. Radiological Training

The inspectors reviewed the licensee's radiological training program to determine compliance with 10 CFR 19.12 and the FSAR. Attention was given to training of non-regular personnel involved with the refueling. The following areas were examined:

- . Scope and content of training
- . Initial training
- . Refresher training
- . Training of the Health Physics Staff
- . Documentation of training

The inspectors interviewed five (5) new contract employees regarding material covered during the training sessions. In additions, training

records were examined for six (6) new plant employees, eighteen (18) contract personnel, and fifteen (15) regular plant employees. See paragraph 11.b for comments regarding training procedures.

No items of noncompliance or deviations were noted.

5. Exposure Control

The inspectors reviewed exposure records for permanent plant employees, transient workers, visitors, and terminated personnel to determine compliance with 10 CFR 20 requirements.

No items of noncompliance or deviations were identified.

6. Respiratory Protection Program

The inspectors examined the licensee's respiratory protection program to determine compliance with 10 CFR 20.103.

No items of noncompliance or deviations were identified.

7. Posting and Control

The inspectors made several visits to various plant areas during April 30 - May 4, 1979, to observe work activities. Attention was given to the following items:

- . Special Work Permit (SWP) areas
- . Housekeeping
- . Visitor control
- . Access control into restricted areas
- . Identification and control of contaminated areas
- . Radioactive materials storage areas
- . Laundry facilities
- . Health Physics supplies and equipment
- . Respirator cleaning and storage areas
- . Health physics counting room
- . First Aid supplies
- . Radioactive waste handling and storage areas
- . Independent measurements made by the inspectors

The above visits included a review of the licensee's program to determine compliance with the following requirements:

- . 10 CFR 19.11
- . 10 CFR 20.203
- . 10 CFR 20.207
- . Special Work Permit (SWP) requirements

No items of noncompliance or deviations were noted.

510 006

8. Radioactive and Contaminated Material Control

The inspectors examined the licensee's program for controlling contaminated tools and equipment.

No items of noncompliance or deviation were identified.

9. Surveys

The inspectors reviewed the licensee's survey program to determine compliance with established procedures, 10 CFR 20.201 and 10 CFR 20.401.b.

No items of noncompliance or deviations were identified.

10. Instruments and Equipment

The inspectors examined the inventory, response tests, and calibrations regarding Health Physics instruments and equipment to determine compliance with established procedures and Technical Specification requirements. This involved a review of the following types of instruments and equipment:

- . Portable survey instruments
- . Fixed personnel monitoring equipment (e.g. portal monitors, friskers, hand and foot counters)
- . Constant air monitors
- . Portable air samplers
- . Pocket dosimeters
- . Area radiation monitors
- . Personnel monitoring devices
- . Whole body counters

See paragraph 11.a for comments regarding calibration procedures for the whole body counter.

No items of noncompliance or deviations were noted.

11. Procedures

The inspectors reviewed selected Health Physics procedures regarding scope and content. In addition, the inspectors also reviewed changes and revisions made to existing radiological procedures between June 1, 1978, and May 1, 1979. It was noted that changes to the procedures were properly reviewed and approved by designated licensee personnel. The following items were discussed with the licensee regarding scope and content of certain procedures:

a. Whole Body Counter Calibration

H. P. Procedure 9.1.8 "Bio-Assay and Whole Body Counting" contains only rather limited details regarding the calibration of the whole

body counter. The licensee stated that the above procedure will be expanded to cover such items as:

- . Acceptance limits
- . Activity of calibration sources
- . Radionuclides
- . Phantom Arrangement
- . Evaluation of Body Burdens versus MPC hours

b. Training Outline

ADM Procedure 1.5 "Training Program" contains basic guidelines regarding radiological training requirements. However, the licensee has not developed a formal outline for the subjects to be covered during training sessions. Presently, each Health Physicist assigned to conduct a particular training session has developed an individual draft outline. The licensee state that single formal outline will be written to ensure that uniform training is provided.

12. Notifications and Reports

The inspectors examined record of notifications and reports to determine compliance with 10 CFR 19 and 20 requirements.

No items of noncompliance or deviations were noted.

13. H. P. Logs and Radiological Incident Reports

The inspectors examined radiological activities documented in the Health Physics Logs and Radiological Incident Reports for the period June 1, 1978, thru May 1, 1979. It was noted that timely follow-up action was either completed or initiated for those items requiring such action.

No items of noncompliance or deviations were noted.

14. Miscellaneous Radioactive Material Sources

The inspectors reviewed the licensee's program regarding miscellaneous sources to determine compliance with plant procedures, Technical Specifications 3.8 and 4.8, and 10 CFR 71.

No items of noncompliance or deviations were identified.

15. Audits

The inspectors examined audits performed by the licensee of the radiation protection program. The licensee's records indicated that an audit was performed during July, 1978. The report was reviewed for scope and timely follow-up action for items identified during the audit.

No items of noncompliance or deviations were identified.

16. Analytical Measurementsa. Confirmatory Measurements Program

Confirmatory measurements were performed on the following samples:

- (1) Liquid waste
- (2) Off gas
- (3) Stack charcoal cartridge
- (4) Stack particulate filter

The confirmatory measurements consist of comparing measurements made by the licensee and NRC's reference laboratory, Idaho Health Services Laboratory (IHSL). IHSL's measurements are referenced to the National Bureau of Standards by laboratory intercomparisons. Confirmatory measurements are only made for those radionuclides identified by IHSL as being present in concentrations greater than 10% of the respective MPC's for liquid and gas samples and above an established Lower Limit of Detection (LLD) for stack samples.

Attachment No. 1 contains the criteria used to compare results. Attachment No. 2 lists the LLDs for stack samples.

b. Results

The following tables show the comparison results:

(1) Liquid Waste (Collected December 19, 1978, and May 3, 1979)

<u>Radionuclide</u>	<u>NRC Measurement</u>	<u>NPPD Measurement</u>	<u>Decision</u>
<sup>51</sup> Cr	1.45±0.35E-05 uCi/ml	3.8±0.32E-05 uCi/ml	Disagreement
<sup>131</sup> I	4.62±0.17E-05 uCi/ml	4.38±0.05E-05 uCi/ml	Agreement
<sup>134</sup> Cs	9.28±0.27E-05 uCi/ml	8.55±0.06E-05 uCi/ml	"
<sup>137</sup> Cs	8.32±0.24E-05 uCi/ml	7.7±0.08E-05 uCi/ml	"
<sup>58</sup> Co	2.0±0.075E-05 uCi/ml	2.54±0.05E-05 uCi/ml	"
<sup>136</sup> Cs	4.12±0.67E-06 uCi/ml	4.77±0.6E-06 uCi/ml	"
<sup>54</sup> Mn	5.5±0.17E-05 uCi/ml	6.79±0.07E-05 uCi/ml	"
<sup>110m</sup> Ag	3.44±0.53E-06 uCi/ml	1.12E-06 uCi/ml	Disagreement
<sup>59</sup> Fe	6.92±0.89E-06 uCi/ml	1.08±0.05E-05 uCi/ml	"
<sup>65</sup> Zn	1.0±0.08E-05 uCi/ml	4.48±0.9E-06 uCi/ml	"
<sup>60</sup> Co	1.32±0.038E-04 uCi/ml	1.59±0.02E-04 uCi/ml	"
<sup>89</sup> Sr	1.8±0.3E-07 uCi/ml	3.49±0.09E-07 uCi/ml	"
<sup>90</sup> Sr	1.4±0.7E-08 uCi/ml	1.88±0.3E-08 uCi/ml	"
gross beta	3.5±0.1E-05 uCi/ml	3.95±0.11E-05 uCi/ml	"
<sup>3</sup> H	1.36±0.02E-03 uCi/n	1.57±0.01E-03 uCi/ml	"

(2) Off Gas (Collected December 19, 1978)

<u>Radionuclide</u>	<u>NRC Measurement</u>	<u>NPPD Measurement</u>	<u>Decision</u>
$^{133}\text{Xe}$	1.30+0.07E-02 uCi/ml	2.10+0.01E-02 uCi/ml	Agreement

(3) Stack Charcoal Cartridge (Collected December 18, 1978)

<u>Radionuclide</u>	<u>NRC Measurement</u>	<u>NPPD Measurement</u>	<u>Decision</u>
$^{131}\text{I}$	8.08+0.27E-03 uCi/sample	8.09+0.11E-03 uCi/sample	Agreement

(4) Stack Particular Filter (Collected April 30, 1979)

<u>Radionuclide</u>	<u>NRC Measurement</u>	<u>NPPD Measurement</u>	<u>Decision</u>
$^{137}\text{Cs}$	9.6+0.3E-04 uCi/sample	1.12+0.02E-03 uCi/sample	Agreement
$^{131}\text{I}$	6.6+0.3E-04 uCi/sample	8.64+0.09E-04 uCi/sample	"
$^{134}\text{Cs}$	9.7+0.3E-04 uCi/sample	1.14+0.13E-03 uCi/sample	"
$^{136}\text{Cs}$	5.4+0.1E-05 uCi/sample	5.27+0.58E-05 uCi/sample	"
$^{58}\text{Co}$	8.6+0.9E-05 uCi/sample	7.1+0.8E-05 uCi/sample	"
$^{54}\text{Mn}$	2.4+0.1E-04 uCi/sample	2.4+0.1E-04 uCi/sample	"
$^{60}\text{Co}$	2.1+0.1E-04 uCi/sample	2.9+0.09E-04 uCi/sample	"
$^{140}\text{La}$	2.5+0.6E-05 uCi/sample	6.32+0.8E-05 uCi/sample	"

No items of noncompliance or deviations were noted.

17. Exit Interview

At the conclusion of the inspection on May 4, 1979, the inspection findings were discussed with the individual denoted in paragraph 1. The inspector summarized the scope of the inspection and the inspection findings.

510 510

ATTACHMENT NO. 1

Criteria for Comparing Analytical Measurements

The following are the criteria used in comparing the results of capability tests and verification measurements. The criteria are based on an empirical relationship established through prior experience and this program's analytical requirements.

In these criteria, the judgement limits vary in relation to the comparison of the resolution.

$$\text{Resolution} = \frac{\text{NRC Value}}{\text{NRC Uncertainty}}$$

$$\text{Ratio} = \frac{\text{Licensee Value}}{\text{NRC Value}}$$

Comparisons are made by first determining the resolution and then reading across the same line to the corresponding ratio. The following table shows the acceptance values.

RESOLUTION	RATIO		
	Agreement	Possible Agreement A	Possible Agreement B
3	0.4 - 2.5	0.3 - 3.0	No comparison
4 - 7	0.5 - 2.0	0.4 - 2.5	0.3 - 3.0
8 - 15	0.6 - 1.66	0.5 - 2.0	0.4 - 2.5
16 - 50	0.75 - 1.33	0.6 - 1.66	0.5 - 2.0
51 - 200	0.80 - 1.25	0.75 - 1.33	0.6 - 1.66
200	0.85 - 1.18	0.80 - 1.25	0.75 - 1.33

"A" criteria are applied to the following analyses:

Gamma Spectrometry where principal gamma energy used for identification is greater than 250 Kev.

Tritium analyses of liquid samples.

Iodine on adsorbers.

"B" criteria are applied to the following analyses:

Gamma Spectrometry where principal gamma energy used for identification is less than 250 Kev.

<sup>89</sup>Sr and <sup>90</sup>Sr Determinations.

Gross Beta where samples are counted on the same date using the same reference nuclide.



## ATTACHMENT NO. 2

LLDs for Nuclides on Particulate and Charcoal Filters

<u>Nuclide</u>	<u>LLD (uCi/sample)</u>
51Cr	1E-04
54Mn	1.5E-05
58Co	1.5E-05
59Fe	3E-05
57Co	2E-05
60Co	3E-05
65Zn	3E-05
89Sr	1E-05
90Sr	2E-07
131I	2E-05
134Cs	2E-05
137Cs	2E-05
140Ba	2E-05
141La	4E-05
141Ce	2E-05
144Ce	1E-04

510 012