U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-282/84-14(DRSS); 50-306/84-16(DRSS)

Dockets No. 50-282; 50-306 Licenses No. DPR-42;DPR-60

Licensee: Northern States Power Company
414 Nicollet Mall
Minneapolis, MN. 55401

Facility Name: Prairie Island Nuclear Generating Plant

Inspection At: Prairie Island Nuclear Generating Plant Site, Red Wing, MN.

Inspection Conducted: October 22-26, 1984

Inspectors: S. Rozak — 11/19/84 — Date

M. J. Oestmann — 11/19/84 — Date

Approved By: M.C. Schumacher, Chief
Independent Measurements and
Environmental Protection Section — 11/19/84 — Date

Inspection Summary

Inspection on October 22-26, 1984 (Reports No. 50-282/84-14(DRSS); 50-306/84-16 (DRSS))

Areas Inspected: Routine announced inspection of: (1) confirmatory measurement program, including sampling, quality control of analytical measurements, and comparison of license analyses with those of the Region III Mobile Laboratory and the NRC Reference Laboratory; (2) management controls, training, and qualifications in chemistry and radiochemistry; (3) internal audits of chemistry and radiochemistry; and (4) licensee followup of items identified in a previous inspection. The inspection involved 55 inspector-hours onsite by two NRC inspectors.

Results: No violations or deviations were identified.

DETAILS

1. Persons Contacted

*D. Mendele, Plant Superintendent of Engineering and Radiation Protection: PINGP
*D. Schuelke, Superintendent of Radiation Protection, PINGP
*D. Stember, Lead Senior Production Engineer, PINGP
*D. Derleth, Radwaste Engineer, PINGP
*D. Larimer, Radiochemistry Supervisor, PINGP
*T. Gatten, Chemistry Coordinator, PINGP
*D. Gauger, Assistant Plant Chemistry, PINGP
*J. Oelkers, Q.C. Inspector, PINGP
*K. Albrecht, Superintendent, Quality Engineering, PINGP
*G. Kolle, Radiation Protection Instructor, PINGP
*J. Hard, NRC Senior Resident Inspector

*Attended exit meeting on October 26, 1984.

2. Licensee Action On Previous Inspection Findings

a. (Closed) Open Item (50-282/84-02-01; 50-306/84-02-01): Licensee to prepare a procedure to delineate responsibilities of personnel to manage radwaste according to 10 CFR 20 and 10 CFR 61. The licensee revised procedure SWI-RP-20 "Radiation Protection Section," Revision 8, dated August 1, 1984, which assigns such responsibilities of managing radwaste to the Lead Senior Production Engineer who reports to the Superintendent of Radiation Protection.

b. (Closed) Open Item (50-282/84-02-02; 50-306/84-02-02); Licensee to develop a QA/QC program including audits of radwaste program in accordance with 10 CFR 20 and 10 CFR 61. The licensee developed a QA/QC program described in a revised procedure D.11 "Radioactive Material Shipment," Revision 3, dated August 1, 1984 which includes a QC inspection checklist (D11.1) to be completed for each radioactive material shipment. No problems were noted by the inspector during review of papers on the radwaste package shipped on October 22, 1984, including the D11.1 checklist.

c. (Closed) Open Item (50-282-/84-02-05; 50-306/84-02-03); Scaling factors and waste classification procedures to be completed by July 1984. The licensee prepared Radiation Protection Implementing Procedures RPIP-1307 "Radwaste Classification," dated October 11, 1984 and RPIP-1310, "Radwaste Streams/Scaling Factors", dated October 9, 1984, which were implemented during the licensee's first shipment (October 15, 1984) of radwaste (to the U.S. Ecology burial site in Hanford, Washington) since the new regulations (10 CFR 20:311 and 10 CFR 61) went into effect on December 27, 1983. No problems were identified during the inspectors' review of the calculations the licensee made in classifying the radwaste shipped on October 22, 1984.

d. (Closed) Open Item (50-282/84-02-04; 50-306/84-02-04): Prepare and implement procedures for shipping manifests and for tracking shipments before shipments are made. The licensee prepared procedure RPIP 1309, "Tracking Radwaste Shipments" dated October 11, 1984 and revised procedure D11 "Radioactive Material Shipment" dated August 1, 1984 for completing the manifest required by 10 CFR 20.311. These procedures were first implemented during the October 15, 1984 shipment.

3. Management Controls, Organization, Training and Qualifications

The management controls, organization and staffing of the chemistry group of the Radiation Protection Section were reviewed. The Radiochemistry Supervisor oversees the chemistry/radiochemistry area and reports to the Superintendent Radiation Protection. The plant chemist under the Radiochemistry Supervisor meets the qualifications of the position description required in ANSI/ANS 3.1-1978. The chemist is responsible for development of the quality control program for radioactive and non-radioactive chemistry tests as discussed in Section 6. The Chemistry Coordinator, who also reports to the Radiochemistry Supervisor, provides for daily work assignments to the seven Radiation Protection Specialists. The responsibilities of each of these positions are described in procedure SWI-RP-20 "Radiation Protection Section Responsibilities, dated August 1, 1984. The inspectors determined that these licensee representatives appear to have adequate management support to effectively meet plant chemistry requirements.

The inspectors also reviewed the training program for the seven Radiation Protection Specialists assigned to the Chemistry group. Each specialist undergoes a six week training cycle in which each specialist spends one week out of six in the Training Department. An individualized training program has been developed involving among other topics, working on new instrumentation, new sampling techniques, new analytical procedures and analyzing quality control split samples. During 1984 the specialists have participated in six cycles. Examinations are taken and qualification cards are maintained on each specialist to determine his progress for possible promotion. No problems were noted regarding the training program.

No violations or deviations were identified.

4. Quality Control of Analytical Measurements

a. Procedures

The inspectors reviewed selected procedures implemented in the hot and cold laboratories and counting room. The licensee is revising his Radiation Protection Section procedures under the title of Radiation Protection Implementing Procedures. Sections 3000-3999 pertain to chemistry and radiochemistry and Sections 4000-4999 pertain to counting room procedures. Procedures in these sections were approved by management in 1983 and 1984. Inspector review of selected chemistry procedures pertaining to specific chemical analysis,

sampling techniques and schedule, sample preparation, analytical instrumentation operating instructions and calibrations revealed no problems.

b. Laboratory and Counting Room Practices

The inspectors toured the chemistry storage room, the hot and cold laboratories to determine that equipment was operable, maintained, and properly calibrated, and chemicals have current preparation and expiration dates affixed to them. Shelf lives for chemical solutions and reagents are defined in RPIP-3102, dated March 29, 1984. The chemistry storage room also was found to have ample supplies of reagents and laboratory equipment. The inspectors made face velocity measurements in two laboratory fume hoods and airflow was found to be adequate. In the hot laboratory, a computer printout is used each day to determine the specific sampling and analyses to be performed according to a schedule described in RPIP 3101 "Routine Sampling Schedule," dated March 29, 1984. Review of records and logs of daily analyses for 1984 revealed no problems. Calibrations of selected instruments were examined and calibration curves were found to be up to date.

No problems were observed during collection of waste gas and steam generator blowdown samples split with the NRC under the confirmatory measurements inspection program.

The licensee also provides split or blind samples to the Radiation Protection Specialist to test their laboratory proficiency. According to RPIP-3104, "Chemistry Quality Control" dated March 27, 1984, quality control samples, including pH, boron, chloride, fluoride ammonia, hydrazine, silica, iron or magnesium, are analyzed twice a year. The Radiation Protection Specialist maintains a qualifications card to demonstrate his ability to follow specific procedures and conduct analytical tests he is qualified to perform. The licensee splits radiological samples on a quarterly basis with a contract laboratory for internal quality control purposes. The licensee also participates in a round robin test run quarterly by NSP's Chestnut Service Center for pH, suspended solids and turbidity. The licensee also participates once a year in EPA's nonradiological crosscheck program. The inspectors examined selected records for these program results. No technical inadequacies were noted in the split sample programs.

The inspectors examined records and practices for performance checks of counting room instruments. The following deficiencies were noted: performance of the gamma spectrometers is checked infrequently--once a week; the results of these checks are not recorded; control limits for the gamma spectrometers are liberal--15% deviation is allowed; for other counting room instruments control limits are not defined; procedures governing performance checks of these counters do not address what actions are to be taken if instrument performance is unacceptable. During the

exit meeting the licensee agreed to make improvements in this area addressing the deficiencies noted above (Open Item 50-282/84-14-01; 50-306/84-16-01).

c. Licensee Internal Audits

The licensee's Quality Assurance Department conducted an audit A-306) of the radiation and chemistry program in February- March 1983 to assure compliance with licensee's requirements in appropriate administrative control directives. Three findings identified were timely responded to and a followup audit closed out the findings in July 1983. A number of quality control inspections of specific chemical analytical tests performed in 1984 revealed no problems.

No violations or deviations were identified.

5. Sample Analyses

Seven inplant samples (gas decay tank, vent charcoal and particulate filters, containment charcoal, steam generator vent particulate grab samples, primary coolant, and steam generator blowdown) were collected and analyzed onsite with the Region III Mobile Laboratory for gamma isotopic activity. Comparative results are presented in Table I. Comparison criteria are outlined in Attachment 1. In addition, the steam generator blowdown sample was split and will be analyzed for tritium, strontium-89 and -90 and gross beta by the licensee and by the NRC Reference Laboratory. Licensee representatives agreed to submit these additional results to Region III for comparison, to be reported in an addendum to this report (Open Items 50-282/84-14-02; 50-306/84-16-02). Of twenty-three comparisons presented in Table I, all are classified as agreements. No comparisons were made for the vent particulate filter because very little activity had been deposited on the filter. The comparison criteria were relaxed for Xe-133 in the steam generator blowdown sample because sample preparation may have caused some outgassing of the noble gases in the two samples that were counted.

No violations or deviations were identified.

6. Exit Meeting

The inspectors met with licensee representatives denoted in Section 1 at the conclusion of the inspection on October 26, 1984. The scope and findings of the inspection were discussed. In response to inspector comments, the licensee agreed to perform the actions discussed in Sections 4 and 5 of this report.

Attachments:
1. Table I, Confirmatory Measurements Programs
   3rd Quarter of 1984
2. Attachment 1, Criteria for Comparing
   Analytical Measurements

TABLE I

U S NUCLEAR REGULATORY COMMISSION

OFFICE OF INSPECTION AND ENFORCEMENT

CONFIRMATORY MEASUREMENTS PROGRAM
FACILITY: PR ISL
FOR THE 4 QUARTER OF 1984

		-------NRC-------		----LICENSEE----		---LICENSEE:NRC----		
SAMPLE	ISOTOPE	RESULT	ERROR	RESULT	ERROR	RATIO	RES	T
GAS	KR-85	3.6E-03	3.0E-04	3.4E-03	3.4E-05	9.4E-01	1.2E 01	A
	XE-131M	1.5E-04	1.7E-05	1.1E-04	5.4E-06	7.4E-01	9.2E 00	A
	XE-133	2.1E-03	1.1E-05	2.0E-03	1.5E-05	9.4E-01	1.9E 02	A
	XE-133M	2.0E-05	3.5E-06	1.5E-05	3.6E-07	7.6E-01	5.7E 00	A
	XE-135	1.4E-05	8.4E-07	1.1E-05	9.4E-08	7.9E-01	1.7E 01	A
L WASTE	I-131	2.4E-05	4.1E-07	2.2E-05	1.2E-06	9.2E-01	5.9E 01	A
	I-133	4.8E-06	2.4E-07	4.5E-06	2.8E-07	9.5E-01	2.0E 01	A
	CS-134	6.0E-06	2.2E-07	5.1E-06	3.1E-07	8.6E-01	2.7E 01	A
	CS-136	1.3E-06	1.3E-07	1.1E-06	1.1E-07	8.4E-01	9.7E 00	A
	CS-137	4.9E-06	2.2E-07	4.3E-06	2.5E-07	8.9E-01	2.2E 01	A
	XE-133	1.1E-05	6.0E-07	1.6E-05	1.5E-06	1.4E 00	1.9E 01	A*
	XE-135	5.7E-07	1.7E-07	6.4E-07	6.1E-08	1.1E 00	3.3E 00	A
C FILTER	I-131	3.6E-03	7.7E-05	3.3E-03	7.0E-05	9.1E-01	4.7E 01	A
	I-133	8.8E-04	5.6E-05	7.5E-04	4.1E-05	8.6E-01	1.6E 01	A
P FILTER	CO-58	3.1E-04	2.8E-05	3.2E-04	2.4E-05	1.0E 00	1.1E 01	A
	I-131	1.9E-01	4.3E-04	2.0E-01	3.0E-03	1.0E 00	4.4E 02	A
	I-133	4.0E-02	3.4E-04	4.1E-02	3.3E-04	1.0E 00	1.2E 02	A
PRIMARY	CS-134	1.1E-02	1.2E-04	1.0E-02	7.0E-04	9.5E-01	8.9E 01	A
	CS-137	1.6E-02	1.8E-04	1.7E-02	1.3E-03	1.1E 00	8.9E 01	A
	I-133	1.3E-03	5.4E-05	1.2E-03	1.4E-04	9.6E-01	2.4E 01	A
	I-134	5.1E-03	7.3E-04	4.3E-03	3.3E-04	8.3E-01	7.0E 00	A
	NA-24	6.8E-03	1.4E-04	7.4E-03	5.3E-04	1.1E 00	4.8E 01	A
U-I CONT	I-131	1.6E-03	6.7E-05	1.9E-03	0.0E-01	1.2E 00	2.4E 01	A

T TEST RESULTS:
A=AGREEMENT
D=DISAGREEMENT
*=CRITERIA RELAXED
N=NO COMPARISON

ATTACHMENT 1

CRITERIA FOR COMPARING ANALYTICAL MEASUREMENTS

This attachment provides criteria for comparing results of capability tests and verification measurements. The criteria are based on an empirical relationship which combines prior experience and the accuracy needs of this program.

In these criteria, the judgment limits are variable in relation to the comparison of the NRC's value to its associated one sigma uncertainty. As that ratio, referred to in this program as "Resolution", increases, the acceptability of a licensee's measurement should be more selective. Conversely, poorer agreement should be considered acceptable as the resolution decreases. The values in the ratio criteria may be rounded to fewer significant figures to maintain statistical consistency with the number of significant figures reported by the NRC Reference Laboratory, unless such rounding will result in a narrowed category of acceptance.

RESOLUTION	RATIO = LICENSEE VALUE/NRC REFERENCE VALUE
	Agreement
<3	No Comparison
≥3 and <4	0.4 - 2.5
≥4 and <8	0.5 - 2.0
≥8 and <16	0.6 - 1.67
≥16 and <51	0.75 - 1.33
≥51 and <200	0.80 - 1.25
≥200	0.85 - 1.18

Some discrepancies may result from the use of different equipment, techniques, and for some specific nuclides. These may be factored into the acceptance criteria and identified on the data sheet.