Reactor Facilities Br.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

APR 8 1976

Northern States Power Company
ATTN: Mr. Leo Wachter, Vice President
Power Production and System
Operation
414 Nicollet Mall
Minneapolis, Minnesota 55401

Docket No. 50-263

Gentlemen:

This refers to the inspection conducted by Dr. M. J. Oestmann and Mr. B. L. Jorgensen of this office on March 15-17, 1976, of activities at the Monticello Nuclear Generating Plant authorized by NRC Provisional Operating License No. DPR-22 and to the discussion of our findings with Mr. L. O. Mayer and other members of your staff at the conclusion of the inspection.

The enclosed copy of our inspection report identifies areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations, and interviews with personnel.

No items of noncompliance with NRC requirements were identified within the scope of this inspection.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosed inspection report will be placed in the NRC's Public Document Room, except as follows. If this report contains information that you or your contractors believe to be proprietary, you must apply in writing to this office, within twenty days of your receipt of this letter, to withhold such information from public disclosure. The application must include a full statement of the reasons for which the information is considered proprietary, and should be prepared so that proprietary information identified in the application is contained in an enclosure to the application.

9

We will gladly discuss any questions you have concerning this inspection.

Sincerely yours,

James M. Allan, Chief
Fuel Facility and Materials
Safety Branch

Enclosure:
IE Inspection Rpt No. 050-263/76-05

cc w/encl:
C. E. Larson, Plant Manager

bcc w/encl:
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U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report of Environmental Monitoring Inspection and Confirmatory Measurements

IE Inspection Report No. 050-263/76-05

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

Monticello Nuclear Generating Plant
Monticello, Minnesota

License No. DPR-22
Category: C

Type of Licensee: BWR (GE) 1670 Mwt

Type of Inspection: Routine, Unannounced

Dates of Inspection: March 15-17, 1976

Principal Inspector: M. J. Oestmann — April 6, 1976 (Date)

Accompanying Inspector: J. L. Jorgensen — 4/7/76 (Date)

Other Accompanying Personnel: None

Reviewed By: J. A. Pagliaro, Chief
Environmental and Special
Projects Section — 4/7/76 (Date)

SUMMARY OF FINDINGS

Inspection Summary

Unannounced routine Environmental Protection and Confirmatory Measurements inspections conducted on March 15-17 (76-05): Reviewed environmental program conduct and management controls; examined program results; discussed and reviewed programs for quality control in sample collections and laboratory radioanalysis; followed up items from the previous environmental inspection;[1/] and discussed results of confirmatory measurement effluent samples previously taken on January 12-13, 1976.

Enforcement Items

None.

Licensee Action on Previously Identified Enforcement Items

No previously identified enforcement items within the scope of this inspection.

Other Significant Items

A. Systems and Components

The licensee has not followed through with their plans for installation and operation of remote meteorological recording equipment in the plant control room as described in a previous inspection report.[2/] The licensee has been obtaining meteorological data from its 330-foot meteorological tower but the data have not been reported to the NRC as requested by regulatory guides. The licensee has taken the position that it need not provide NRC with any additional meteorological data beyond that provided in the PSAR and FSAR. (Paragraph 5.h., Report Details)

B. Facility Items (Plans and Procedures)

No significant items were identified within the scope of this inspection.

C. Managerial Items

Responsibilities for accomplishing, managing, and auditing environmental programs have been reorganized within the Engineering Vice Presidential staff, resulting in a new Environmental-Governmental Activities Department (EGAD) and limited transfer of personnel and

1/ RO Inspection Report No. 050-263/74-11.
2/ Ibid.

responsibilities to the Nuclear Support Services Department (NSS). The agreement with the Minnesota Department of Health (MDH) to perform the radiological environmental monitoring program was terminated on January 1, 1976. The radiological environmental sample collection and delivery will continue to be conducted by EGAD and the samples will now be analyzed by Nalco (Industrial Bio-Test Laboratories) of Northbrook, Illinois. (Paragraph 3.b., Report Details)

One unresolved item was identified pertaining to the necessity for the licensee to perform and report on an evaluation of a few instances wherein I-131 concentrations in the milk samples exceeded 2.4 pCi/l in September, 1975. (Paragraph 5.d., Report Details)

D. Noncompliance Items Identified and Corrected by Licensee

None.

E. Deviations

None.

F. Status of Previously Reported Unresolved Items

No previously reported unresolved items within the scope of this inspection.

Management Interview

A management interview was conducted on March 17, 1976, with L. O. Mayer, Manager of NSS, and E. C. Ward, Manager, Nuclear Environmental Services (NSS). The following items were discussed with the licensee representatives:

A. The NRC inspectors discussed the scope and intent of this specific inspection. (Paragraph 2, Report Details)

B. The inspectors and the licensee discussed the environmental monitoring program management. (Paragraph 3, Report Details)

C. Licensee programs for quality control of analytical measurements were discussed. The licensee currently uses a two sigma action criterion. The licensee and Nalco are discussing alternative criteria and are developing procedures to define what action would be taken if the analytical results were in excess of these criteria. (Paragraph 4, Report Details)

D. The licensee stated that the carbon-impregnated filters utilized for airborne radioiodine monitoring are being replaced with carbon cartridges. (Paragraph 5.c., Report Details)

E. The licensee discussed the arrangements for calibration of portable flow meters to determine air particulate sample volumes. (Paragraph 4, Report Details)

F. The licensee and inspectors also discussed the status of development of the Appendix B Technical Specifications, particularly those implementing the ecological programs. (Paragraph 5.f., Report Details)

G. The unresolved item pertaining to evaluation and reporting of levels of I-131 in milk above 2.4 pCi/l was discussed. (Paragraph 5.d., Report Details)

H. The inspectors discussed the reporting and recording of results of the meteorological program. (Paragraph 5.h., Report Details)

REPORT DETAILS

1. Persons Contacted

Persons contacted, in addition to those identified in the Management Interview Section of the Summary of Findings were as follows:

B. W. Clark, Administrator, Radiation Environmental Monitoring (NSS)
J. L. Bechthold, Administrator, Environmental Sciences, Environmental-Governmental Activities Department (EGAD)
G. D. Heberling, Jr., Supervisor, Ecological Studies (Monti/Sherco), (EGAD)
D. J. Johnson, Environmental Aide (Sherco) (EGAD)
L. Eliason, Radiation Protection Engineer
R. Jacobson, Plant Chemist

2. General

The Environmental Protection portion of this inspection consisted of an examination of the licensee's environmental monitoring activities including sampling techniques and procedures, sample collection equipment and locations, and program results. Management control aspects including organizational structure, assignment of responsibilities and authorities, and administrative procedures and control, were also examined. The licensee's technical specifications were utilized as the primary inspection criteria.

This inspection also included an examination of the licensee's program and practices to assure quality control of sample collection, handling, and shipment and of analytical measurements.

Although the licensee has conducted a non-radiological monitoring program since 1968, the technical specifications do not contain non-radiological requirements; such specifications are expected to be issued later this year. The non-radiological portion of the licensee's environmental monitoring program will be examined in detail during an inspection conducted subsequent to the issuance of the Appendix B Technical Specifications.

The Confirmatory Measurements portion of this inspection consisted of comparison of the licensee's measurement of radioactivity to those of the NRC's reference laboratory. The two laboratories performed measurements on the same samples or on duplicates or

split samples. The measurements made by the NRC laboratory are referenced to the National Bureau of Standards Radioactivity Measurements System by laboratory intercomparisons. The inspectors and licensee will continue to determine the basis for differences in analytical results which will be examined at a subsequent confirmatory measurements inspection.

3. Management Controls

The licensee's administrative and procedural controls for implementation of the environmental monitoring program were examined. This examination included a review of assignments of responsibilities and authorities for program management and implementation.

a. Management Organization

Since the time of the previous Environmental Protection inspection [3/], the licensee has engaged in a reorganization of certain management and audit functions relating to the conduct of the radiological and nonradiological environmental monitoring program. Functions previously assigned to the Engineering Vice-Presidential Staff are now vested in a new Environmental-Governmental Activities Department (EGAD) and in the Nuclear Support Services Department (NSS). EGAD has responsibilities for placement of monitors, collections, shipping and delivery of the radiological environmental samples to the contractors for radioanaylses, for operation and maintenance of the meteorological field equipment and data collection system, and for the development and conduct of the non-radiological environmental monitoring program, including collection and delivery of non-radiological environmental samples to the contractor. EGAD also maintains cognizance of the aquatic biota protection conditions, reports to NSS when the protection conditions are exceeded, and will produce other reports which will be required by the Appendix B Technical Specifications.

The NSS Department has administrative responsibilities for contract management for analysis of the radiological and non-radiological samples, for production of certain routine and nonroutine reports, for reduction and computer processing of the meteorological program results and development of suitable calculational procedures for dose pathway reporting to the NRC, and for conduct of independent audits of environmental program activities. NSS also maintains cognizance of plant radwaste effluent and environmental radiation levels.

3/ Ibid.

b. Contractor Changes

The licensee's agreement for performing the radioanalytical environmental monitoring program with the Minnesota Department of Health was terminated on January 1, 1976. The licensee has retained Nalco (Industrial Bio-Test Laboratories), Northbrook, Illinois to carry out this function. The licensee's EGAD is responsible to place and replace the environmental monitors and collect samples and prepare them for shipment to Nalco.

The scope of the environmental film badge monitoring program with Landauer of Glenwood, Illinois, has been reduced. Starting on October 26, 1975, the number of film badges exposed for a four-week period was reduced in number from 47 to 22 badges at 14 locations. This change is within the Technical Specification requirements. In addition, a contract that furnished a set of 30 environmental film badges was cancelled.

c. Review and Audit

As noted in 3.a., above, the NSS has been assigned review and audit responsibilities for areas to be covered by the Appendix B Technical Specifications. Procedures for auditing and recording results of audits and inspection of the radiological environmental monitoring program content have been prepared. Procedures for audit of the analytical quality control program to be carried out by Nalco are not now prepared but will be prepared by another contractor for future implementation. A computer system exists for reporting results of program audits and inspections to supervision and management for their review.

d. Criteria for Corrective Action

The licensee's contractors have been using a two sigma action criterion in the analysis of radiological environmental sample results. The licensee is provided immediate notification and explanation of missed samples and if results exceed the two sigma criterion. The licensee will be responsible to evaluate the significance of the results and to issue additional instructions as necessary.

4. Quality Control of Analytical Measurement

The licensee's contractor for the radiological environmental monitoring program will maintain a laboratory quality control program for radioanalysis. The contractor has provided the licensee with a general program description and is now working

with the licensee to customize the program to the licensee's contract specifications. The licensee has not yet approved the quality assurance program but expects to give formal approval in the near future when the program meets contract specifications. The contractor participates with the Environmental Protection Agency in cross referencing standard samples.

The licensee through EGAD will perform sample collection, field treatment, packaging and shipment to the contractor in accordance with quality control procedures which are to be developed by the contractor in consultation with the licensee. A number of these sampling and shipping procedures developed by the contractor have been reviewed and approved by the licensee.

Procedures for the action criterion mentioned in Section 3.d., above, are being developed between the licensee and the contractor. The analytical procedures and lower limits of detection given in HASL-300 are a contractual requirement of the licensee's environmental monitoring contractor.

The inspectors reviewed the records of the quality control program carried out by the previous contractor (MDH) and found that the previous contractor provided the licensee with accuracy and precision control charts monthly. Selected followup actions taken on identified deficiencies in analytical results were reviewed and the inspectors found that except for radioiodine-131 in milk as discussed below in Section 5.d., variations were within normal statistics.

The licensee has revised its sample collection and calibration procedures to reflect a change in the method of determining the air particulate sample volume in response to the previous inspection report.[4/] Another contractor is hired for instrument calibration of the portable flowmeter used but no formal procedures for calibration nor frequency of checking the calibration has been established by the licensee. This item will be examined further in a subsequent inspection.

5. Implementation and Results of the Environmental Monitoring Programs

The implementation and results of the licensee's radiological environmental monitoring program for the second half of 1974, and the full year of 1975 were selectively examined for compliance with the monitoring and reporting requirements and for corrective actions on identified deficiencies. The installation and operability of selected radiological environmental monitoring stations were also examined. Change 15 to the Appendix A Technical Specifications contains the existing environmental radiological monitoring program requirements. On October 15, 1975 and on March 1, 1976, the licensee submitted to the Office of Nuclear Reactor Regulation a revised monitoring program which has not yet been put into effect.

4/ Ibid

a. Environmental Monitoring Reports

Except for several milk samples containing identifiable quantities of iodine-131, no unusual results or trends were noted in the inspectors' review of the radiological environmental monitoring results. The licensee reports in its semiannual operating reports those instances identified where samples were missed or were not obtained or samples not analyzed. The licensee has implemented arrangements with its new contractor to continue to identify and obtain such missed samples or analyses and to justify each event.

b. Availability of Clams

The inspectors noted, as discussed in the previous inspection report,[5] a continued failure to collect clam samples through the last half of 1974 and through 1975. The licensee has stated that efforts to acquire these samples, in areas of the river which might serve as an indicator of the Monticello Nuclear Generating Plant radiological effects, have not been successful. The licensee believes the program has value and plans to continue this program. The inspectors discussed the level of effort and number of attempts made before the licensee concludes clams are not available. This item will be examined in a subsequent inspection.

c. Air Samplers

The licensee has purchased new air samplers to replace the older air samplers. These new samplers utilize charcoal cartridges rather than carbon-impregnated filters. This change is responsive to the discussion of this item in the previous inspection report.[6] The new air samplers will also be provided with portable flowmeters. A procedure for an annual calibration of the flowmeters in the new air samplers has been prepared.

The downtime of previous air samplers has been kept to a minimum. Spare parts are available at the site. All the routine maintenance of air samplers including preventive maintenance is done through EGAD.

d. Radioiodine Levels in Milk

The licensee has been previously collecting milk samples from dairy cows located at farms in four different regions surrounding the plant but at least 5.6 miles away. Since March 1975, milk samples have been obtained from four farms

5/ Ibid.
6/ Ibid.

within two-three miles from the plant. The inspectors examined the analytical results, particularly of radio-iodine-131 in milk taken from these nearby farms. The licensee had noted that since May 1975, the milk samples from nearby farms began to show increased levels of radio-iodine-131. The inspectors examined the licensee analysis of the correlation between plant vent releases and the levels observed in milk from May through July 1975.

The licensee concluded that a close correlation existed between plant vent releases and levels of I-131 found in milk from nearby farms during this period. When considered by averaging on a semi-annual basis with previously observed concentrations, these levels (which were below 2.4 pCi/l) represent only a fraction of 1% of the dose levels corresponding to 10 CFR 20, Appendix B, Table II concentrations. However, three milk samples taken from the two nearest farms on September 2, 9, and 16, 1975, showed iodine-131 concentrations in excess of 2.4 pCi/l. The licensee reported in its semiannual operating report the level of 4.7 pCi/l of iodine-131 as the highest level found in the second half of 1975. The licensee concluded in its semiannual report No. 10 that "the iodine-131 levels detected are equal or greater than those observed at other locations during this six month period but are consistent with levels observed during 1974."

The inspectors discussed the earlier (1973 and 1974) results for this analysis in followup on the previous inspection.[7/] The licensee stated that their review of these earlier results, for which I-131 concentrations greater than 2.4 pCi/l were reported, had found them not to be typographically in error. However, due to the greater statistical uncertainty of the analytical method used at that time, the licensee does not believe that the earlier results represent positive indications. The 1975 results, on the other hand, are not considered to be compromised by statistical uncertainty.

Technical Specification 6.7.A.2.h(2) requires the licensee to provide estimates of likely exposures to individuals and population groups, and the bases for these estimates, when the environmental monitoring program results indicate the likelihood of intakes in excess of 1% of those that could result from continuous exposure to the concentration values of Appendix B, Table II, Part 20. Although concentrations of I-131 in milk greater than 2.4 pCi/l appear to meet this criterion, the licensee did not provide the estimates and bases discussed above for the samples of

7/ Ibid.

September 2, 9, and 16, 1975. Since the referenced specification is unclear concerning the number of samples or the duration of the period after which these actions are required, this item is considered an unresolved item at this time. This matter will be referred to the Office of Nuclear Reactor Regulation and will be examined further at a subsequent inspection.

e. Elevated Thermoluminescent Detector (TLD) Results

The inspectors noted that the licensee contacted the MDH laboratory concerning the reported TLD network results showing elevated levels during 1974 similar to those for 1973. The MDH laboratory maintains the position that the results show that the plant effluents contributed to the elevated radioactivity background level surrounding the plant. A figure in the 1974 semiannual operating report shows a close correlation between the TLD levels and off-gas release rates from the plant. With the operation of the augmented off-gas system starting in October 1975, a reduction in the contribution of the plant effluents to the background levels around the plant is expected. This item will be examined in a subsequent inspection.

f. Sample Monitoring Stations

The inspectors examined selected radiological environmental sampling stations and found them to be operable and located as specified. The licensee has just received new air samplers which will be placed in operation with the next several days.

The inspectors noted the records kept by EGAD for collecting and shipping samples were in order. This information is supplied in the semiannual operating reports, including justification for missed samples.

g. Non-radiological Effluents and Monitoring Program

No limits on release of non-radiological effluents nor ecological programs are required in the Technical Specifications. The licensee has been working with the Office of Nuclear Reactor Regulation to prepare and finalize Appendix B Technical Specifications. The ecological programs are managed through EGAD and are carried out with the assistance of personnel from St. Cloud State University. The inspectors also visited a building containing fishing gear and boats which are used for the ecological sampling program. An inspection of the non-radiological monitoring program will be carried out subsequent to the issuance of the Appendix B Technical Specifications.

h. Meteorological Monitoring Program

A meteorological tower complying with recommendations contained in Regulatory Guide 1.23 is currently operable. The inspectors observed the present 330-foot meteorological tower and the equipment used for recording wind speed, direction, dewpoint, temperature and temperature differentials at 33, 140 and 330-foot elevations. The equipment is calibrated by a contractor on a quarterly basis. Checks are made daily to assure equipment is operable. A computer printout is available but not in use. The licensee stated that it does not plan to put this remote recording equipment in the plant control room as discussed in the previous inspection report.[8/] The licensee also stated that since one year of meteorological data has already been provided NRC in the FSAR, it did not believe it was necessary to supply the NRC with any additional meteorological data as requested in Regulatory Guides 4.8 and 1.21. This item will be referred to the Office of Nuclear Reactor Regulation and will be examined further during a subsequent inspection.

6. Confirmatory Measurements

The Confirmatory Measurements portion of this inspection consisted of a test of the licensee's capabilities for measurement of radioactivity in actual plant effluent samples. In addition, changes in a licensee procedure for analysis of tritium in liquids and a correction to data provided in a previous report[9/] were discussed.

a. Analytical Results

This inspection showed some of the licensee's measurements on these samples are acceptable under the test criteria used by the Office of Inspection and Enforcement for comparing measurement results (see the attachment). However, one of the licensee's measurements did not yield an acceptable comparison in that the licensee did not identify the presence of Xe-133m in waste gas as did the NRC reference laboratory. The types of samples tested and the results of measurements were as follows:

8/ Ibid.
9/ IE Inspection Report No. 050-263/76-01.

(1) Type of Sample: Off-Gas (1/76)
(Results in units of μCi/ml)

ACCEPTABLE

Radionuclide	NRC Reference Measurement	Licensee Measurement
Xe-133	4.4 ± 0.1 E-03	4.99 ± 0.07 E-03

NOT ACCEPTABLE

Radionuclide	NRC Reference Measurement	Licensee Measurement
Xe-133m	7.0 ± 0.9 E-04	Not detected

(2) Type of Sample: Liquid Standard (4/75)
(Results in units of μCi/ml)

ACCEPTABLE

Radionuclide	NRC Reference Measurement	Licensee Measurement
H-3	7.87 ± 0.09 E-03	10/ 8.23 ± 0.08 E-03

NOT ACCEPTABLE: None

(3) Type of Sample: Particulate Filter (1/76)
(Results in units of μCi/sample)

ACCEPTABLE

Radionuclide	NRC Reference Measurement	Licensee Measurement
Ba-140	7.9 ± 0.2 E-02	5.43 ± 0.12 E-02
Cs-137	7.7 ± 0.5 E-04	5.80 ± 2.28 E-04

NOT ACCEPTABLE: None

(4) Type of Sample: Charcoal Adsorber (1/75)
(Results in units of μCi/sample)

ACCEPTABLE

Radionuclide	NRC Reference Measurement	Licensee Measurement
I-131	3.97 ± 0.13 E-02	4.19 ± 0.15 E-02

NOT ACCEPTABLE: None

10/ This value corrects that previously reported - see Paragragh 6.c.

b. Samples Not Meeting Acceptance Criteria

The analysis for Xe-133m in an off-gas sample did not meet the acceptance criteria in that the licensee did not detect this nuclide while it was detected and reported by the NRC reference laboratory. Subsequent examination of the records by both laboratories did not disclose any basis in the counting analysis, calculations or transcription of results for the noted disparity. The licensee program did search for Xe-133m, and reported less than the minimum detectable activity of 8.2 E-05 uCi/ml for the geometry and counting time used. In discussions with the licensee, a licensee representative noted that there is a potential for this nuclide to be masked by other short-lived nuclides if the sample is counted soon after it is taken, as the licensee did. It was agreed that arrangements would be made at the next sample split for the licensee to hold the sample for a few days before analysis. This item will then be re-examined at a subsequent inspection.

For the purpose of reporting releases of Xe-133m and demonstrating compliance with technical specification conditions, the licensee utilizes calculational models based on analyses for other, more readily quantifiable nuclides, including Xe-133m and five short-lived isotopes. This program was examined by the NRC staff and is part of the basis for the technical specifications themselves. The licensee stated that counting analysis has rarely identified Xe-133m directly, and that no comparison of measured and calculated values has been performed by the licensee. On the basis of this information, the licensee's failure to identify Xe-133m by direct count does not have implications with respect to reporting and demonstrating compliance.

c. Quality Control in Radioanalysis - Tritium

The licensee program for quality control in radioanalysis was examined and reported during a previous inspection.11/ The referenced inspection report identified an analysis for tritium in a standard sample as yielding an unacceptable comparison. On further examination, the licensee found and reported that radioactive decay of the tritium standard used for determination of equipment efficiency had not been taken into account. The corrected value determined by the licensee is identified in Paragraph 6.a.(2) of this report and yielded an acceptable comparison. The licensee's actual original and corrected calculations were examined by the inspectors during the inspection.

11/ IE. Inspection Report No. 050-263/76-01.

In additional discussions concerning analysis for tritium, the licensee stated that a new tritium standard was prepared in January 1976 and that a program has been developed and implemented to automatically adjust for radioactive decay of the standard. Further, the licensee plans to add a program segment which will automatically flag calculated efficiency changes greater than three percent on sequential standard counts.