U. S. ATOMIC ENERGY COMMISSION
REGION III
DIVISION OF COMPLIANCE

Report of Inspection

CO Report No. 263/70-8

Licensee:	Northern States Power Company Monticello Nuclear Generating Plant Construction Permit No. CPPR-31 Category B
Dates of Inspection:	April 22, 23, and 24, 1970
Dates of Previous Inspection:	April 14, 15, and 16, 1970
Inspected By:	C. D. Feierabend Responsible Reactor Inspector May 14, 1970
	E. L. Jordan Reactor Inspector May 14, 1970
Accompanied By:	J. G. Keppler Senior Reactor Inspection Specialist
	H. D. Thornburg Senior Reactor Inspector
Reviewed By:	H. D. Thornburg Senior Reactor Inspector May 18, 1970
Proprietary Information:	None

SUMMARY

The assignments for authority and responsibility were found to be satisfactorily resolved in a revision of the Emergency Plan. (Section II.A.1.)

The applicant has satisfactorily communicated with supportive personnel and organizations regarding their functions in support of the Emergency Plan. (Section II.A.3.) The applicant has prepared a draft of a procedure to test the implementation of the Emergency Plan and to test the communications system associated with the plans. (Section II.A.2.)

The operating procedures were found to satisfy FSAR commitments and PI-2000/1 guidance with few exceptions. The applicant stated that most of the exceptions would be incorporated in the next revision. (Section II.B.4.)

The Cold Functional Test Plan was found to be satisfactory. (Section II.D.1.)

The Hot Functional Test Plan was discussed in a meeting with the applicant and GE. The test plan was found to be lacking in detail. The applicant stated that the test plan would be revised to include more details. (Section II.D.2.)

A draft of the Startup Test Procedures was reviewed. It appears to satisfy FSAR commitments and CO:HQ guidance with few exceptions. (Section E.)

DETAILS

I. Scope of Inspection

An announced inspection of the Monticello Nuclear Generating Plant was made on April 22, 23, and 24, 1970. Mr. E. L. Jordan, Reactor Inspector, reviewed the status of the preoperational testing, the operating procedures, and the startup test procedures. The applicant's Hot Functional Test Plan was discussed during a meeting on April 23, 1970, between Northern States Power and General Electric personnel and Compliance Inspectors: H. D. Thornburg, Senior Reactor Inspector, J. G. Keppler, Senior Reactor Inspector Specialist, C. Feierabend and E. Jordan, Reactor Inspectors. The Wright County Sheriff's office and the Monticello Police Department were contacted on April 22 by E. L. Jordan regarding their role in the Monticello Emergency Plan. Messrs. H. D. Thornburg and C. D. Feierabend met with the Minnesota Health Department on the same subject on April 24.

The following personnel were contacted during the course of this inspection:

Northern States Power (NSP)

C. Larson	- Plant Superintendent (Operations)
M. Clarity	- Assistant Plant Superintendent
L. Eliason	- Radiation Protection Engineer
G. Jacobson	- Plant Results Engineer
W. Anderson	- Plant Maintenance Supervisor
B. Clark	- Environmental Chemist
D. Bohn	- Nuclear Plant Supervisor, Engineering

General Electric (GE)

J. Miller	- Operations Manager
H. Daughtery	- Assistant Operations Manager
R. Hobson	- Test Design and Analysis Engineer
G. Matty	- Test Engineer

Minnesota Health Department (GE)

Dr. W. Lawson	- Director, Division of Environmental Health
Miss A. Dolzal	- Assistant

Wright County Sheriff Department

D. Wolfe - Sheriff
J. Powers - Deputy Sheriff

Monticello Police Department

A. McIntire - Police Chief

II. Results of Inspection

A. Emergency Plan (PI-2015)

1. Authority and Responsibility

The inspector reviewed the approved version of the Emergency Plan (Volume E.3 of the Operations Manual). The assignment of responsibility was clarified in the approved procedure. Appropriate provisions are now included for relief of the Shift Engineer by management personnel.

Changes in the procedure appear to be responsive to our comments during a previous inspection[1/], and the matter is considered resolved.

2. Emergency Plan Tests

The inspector reviewed a draft of a procedure to test the Emergency Plan prior to fuel loading. The procedure is designed to include the following tests: personnel response, communications systems, and evacuation alarms.

The procedure has provisions for reporting the results of each test and revising the Emergency Plan if necessary. Results of the tests will be reviewed by the Operations and Safety Audit Committee.

The test of the communications equipment appears responsive to CO comments concerning the need for a preoperational test, as discussed in a previous inspection report.[2/] The results of the test will be reviewed before fuel loading.

[1/] CO Report No. 263/50-5, Section II.F.3.a.(1).

[2/] CO Report No. 263/70-5, Section II.F.3.

3. Participating Organizations

The inspectors contacted personnel from the Wright County Sheriff's Department, Monticello Police Department, and MHD during this inspection. CO had previously contacted personnel from the Monticello Big Lake Hospital[3/] and the NSP Northwest Division office at St. Cloud.[4/] The inspectors found that NSP had contacted participating organizations, and that they were familiar with the emergency plan.

a. Wright County Sheriff

The inspector met with the Wright County Sheriff, Mr. D. Wolfe, and his deputy, Lt. J. Powers, on April 22 in the Wright County Sheriff's office.

The inspector found that the Sheriff's Department had been contacted by NSP on three occasions. Both Sheriff Wolfe and Lt. Powers appeared knowledgeable of their role in the Emergency Plan. A copy of the Emergency Plan was found to be kept at the dispatcher's desk, which was stated by Sheriff Wolfe to be continuously manned.

b. Monticello Police Department

The inspector contacted Mr. A. McIntire (Monticello Chief of Police) on April 22 at his office. Chief McIntire stated that he had been contacted by NSP personnel on at least two occasions regarding implementation of the Emergency Plan. Chief McIntire had a copy of the Emergency Plan available in his office and appeared to be knowledgeable regarding the role of the Monticello Police Department in the plan.

c. Minnesota Health Department

The inspectors, accompanied by Messrs, Eliason, Clark, and Bohn (NSP), contacted Dr. W. Lawson and Miss A. Dolzal of MHD at their offices in Minneapolis on April 24. The inspectors found that the MHD had been contacted by NSP on several previous occasions. Dr. Lawson appeared

3/ CO Report No. 263/70-7, Section II.A.

4/ CO Report No. 263/70-5, Section II.F.3.

to be conversant with the plans and some of the MHD comments had been incorporated into the approved plan. Dr. Lawson stated that a channel of communication to water supply officials in the area had been established. A call list exists at the MHD, and NSP has a backup bypass call list direct to the water works.

B. Review of Operating Procedures (PI-2000/1)

The NSP Operations Manual (OM) was reviewed in accordance with PI-2000/1. The OM was found to satisfy the FSAR commitments and met PI-2000/1 guidance and regulatory requirements except where noted below:

1. Approval Status (by NSP Operations Committee)

Volume (Emergency Plan) and Volume A (General Administration) of the OM have been approved. Portions of Volume C (Integrated Operation) have been approved. The inspectors asked the licensee when all of the procedures would be completed and approved. Mr. Larson stated that they would be completed prior to fuel loading.

The procedure review and approval system implemented by NSP appeared to be satisfactory.

2. General Administration (Volume A)

The following specific areas of operating philosophy (PI-2010.01) are not addressed in the draft Volume A of the OM.

a. The responsibility of the operator to believe instrumentation indications until they are proven incorrect.

b. The authority and responsibility of the operator for scram or protective actions.

c. A description or definition of proper relief for operating personnel.

Mr. Clarity stated that statements regarding the above listed items would be added to Volume A.

3. Integrated Operation Volume C

Volume C was found to lack the following specific statements regarding reactor startup and operation:

a. Prerequisites (2020.02)

A verification of the presence of the control rod support fixtures before startup.

b. Limitations and Actions (2020.03)

A statement should be included to require more conservative rod withdrawal near critical prediction.

c. Reactivity Control (2025.02)

A statement should be included to restrict deliberate reactivity additions to one parameter at a time.

Mr. Clarity stated that statements regarding the above listed items would be added to Volume C.

d. Surveillance Procedures Volume C-5

The inspector reviewed a draft of surveillance procedures which contained a listing of the surveillance tests. A procedure for each test is being prepared or extracted from Volume B of the OM which is called System Description and Operation.

e. Abnormal Procedures

The abnormal procedures do not address acts of nature or control room evacuation. Mr. Clarity stated that procedures were being prepared to cover tornado, seismic disturbance, flood and control room evacuation.

4. Special Equipment and Operations Volume D

The initial fuel loading procedure contained in Volume D was found to be lacking in detail.

Mr. Clarity stated that the Volume D procedure was intended to be general. He stated that a draft document entitled "Requirements and Administration For Initial Fuel Loading" has been prepared by GE to complement the Startup Test Fuel Loading Procedure. It appears that the combined documentation will satisfy the guidelines of PI-2055.

C. Preoperational Testing

1. Procedure Review

a. Process Computer

Omission of the process computer from the preoperational test outline was noted in a previous inspection report.[5] A satisfactory test procedure was found to have been prepared by NSP. The procedure includes a wire check, a test of each input for proper units and calibration, and a demonstration of balance of plant program. The nuclear programming will be tested during Startup Test No. 29. This item is considered resolved.

b. Reactor Core Isolation Cooling System (RCIC) A-12

Provisions for including a test of the RCIC under loss of power conditions was discussed in a previous inspection report.[6] The Standby Diesel Generator Test, Preoperational Test No. B-18, includes a test of the RCIC system under power failure conditions. This item is considered resolved.

2. Preoperational Test Results (PTR)

The inspector reviewed test results by examination of the field copy of the test data, examination of NSP test status reports, and by discussion with Mr. Jacobson. The results of the review and the status of the systems reviewed are summarized below:

a. Residual Heat Removal System PTR A-8

An inspection of the cleanliness of the containment spray header pipe was performed by Bechtel preceding an air flow test through each nozzle. The nozzle performance substantiation[7] has not yet been accomplished. It was indicated that such a test would be performed.

[5] CO Report No. 263/70-2, Section II.A.1.

[6] CO Report No. 263/69-12, Section II.C.6.

[7] CO Report No. 263/70-5, Section II.D.1.b.

b. Reactor Protective System PTR C-1

The inspector found that response time measurements performed to date measured the time interval from trip actuation to scram solenoid valve deenergizing. The inspector asked the applicant to consider measuring the neutron instrument response times. The applicant stated that they would consider additional testing of the neutron monitoring instrumentation response time.

c. Cleanup Demineralizers PTR A-9

The applicant is planning to perform a demonstration of the serviceability of the system.[8]

d. Compressed Air System PTR B-3

The Safety Audit Committee is evaluating the operation of air-operated equipment for fail-safe operation in the event of an air failure.

e. Condensate Demineralizer PTR B-7

The test data sheets that were noted to be incomplete in a previous inspection report[9] were found to be satisfactorily completed.

f. Standby Diesel Generator PTR B-18

The diesel generator performance test, B-18A, was found to be partially completed.

g. Secondary Containment

A preliminary test has been initiated to identify any major leaks by smoke tests.

h. Core Spray PTR A-11

An amendment to the test procedure adds verification of the system logic component function via an added surveillance test jack. The test jack addition was

[8] CO Report No. 263/70-5, Section II.D.1.c.

[9] CO Report No. 263/70-2, Section II.A.4.b.

required by DRL. Acceptance criteria[10] for flow rate and start time were found to have been included in the results evaluation made by the applicant.

i. Recirculation System and Motor Generator Sets PT: A-6

The alarm conditions which were identified in a previous report[11] were determined by the applicant to be due to air trapped in the sensor line. The applicant is maintaining a start log for motor warranty purposes and has logged successful pump starts at ambient pressure and also at a pressure of 1000 psig.

The pump control system has a unique pump start permissive monitor which takes into account the stator temperature, rate of change of temperature, and time since last start to operate an annunciator when a start is permitted.

j. Instrument Excess Flow Check Valve Test

Excess flow check valves in instrument lines were discussed in a previous inspection report.[12] The inspector reviewed results of an excess flow check valve test. The applicant found that the following valves failed to seat properly during the test.

Valve No.	Description	Seat	
		100' Psi	1000 Psi
X-31	Recirculation Loop ΔP	No	OK
X-40A	Jet Pump Instrument Line	No	No
X-50	Oxygen Analyzer Line	No	OK

The valves which failed to seat are scheduled for maintenance and retesting. The testing also identified a liquid type check valve installed in a drywell pressure sensor line. This will be replaced with the proper valve.

[10] CO Report No. 263/69-12, Section II.C.5.

[11] CO Report No. 263/70-5, Section II.D.2.b.

[12] CO Report No. 263/70-1, Section II.B.

k. Reactor Safety Valve and Main Steam Isolation Valve PTR A-2

The inspector found that the acceptance criteria for valve closure time, reported as missing from the preoperational test procedure in a previous report[13] has been included in the review of results by the applicant. This item is considered resolved.

l. Control Rod Test PTR A-4

The applicant was found to have performed the scram testing discussed in a previous CO report[14] except for 25 scrams each of two control rods. Acceptance criteria were found to be included during the review of results.[15] The applicant has stated that this testing would be included.

m. Fire Protection System PTR B-2

The data previously reported[16] as missing from the test procedure were found to have been included in the test results file.

3. Test Witnessing

The inspector observed a special test of the condensate demineralizer system which was being conducted by GE personnel to obtain engineering information regarding the efficiency of the Powdex demineralizer precoat process. The test included injecting a solution of sodium nitrate into the demineralizer influent and observing the effluent conductivity for signs of "break through" of the precoat. Results of the test were not yet available. The test organization and implementation appeared to be satisfactory.

While in the reactor building to observe other testing, the inspector observed that control of foreign objects over the reactor vessel was not being enforced. The inspector observed six persons working around the edge of the reactor pressure vessel. Some had pencils in shirt pockets. No restraints were seen on watches and eyeglasses. This was discussed during the exit interview.

[13] CO Report No. 263/69-12, Section II.C.2.

[14] CO Report No. 263/70-5, Section II.D.1.a.

[15] CO Report No. 263/69-12, Section II.C.3.

[16] CO Report No. 263/69-12, Section II.C.7.

The inspector also observed an accumulation of crud on the near horizontal surfaces of the steam separator dryer as it was being removed from the reactor vessel. This also was discussed during the exit interview.

D. Functional Testing

A meeting of the following persons was held on April 23 to discuss the CO position regarding the adequacy of the Monticello Functional Testing Plans:

CO	NSP	GE
J. Keppler	C. Larson	J. Miller
H. Thornburg	M. Clarity	H. Daughtery
C. Feierabend	G. Jacobson	G. Matty
E. Jordan	K. Gelle	

1. Cold Functional Test

Mr. Keppler stated that the Cold Functional Test Procedure was comprehensive.

2. Hot Functional Test

Mr. Keppler stated that CO had reviewed the draft Hot Functional Test Plan and determined that it should be more detailed. Mr. Miller asked CO to amplify their comments.

Mr. Keppler stated that the purpose of the hot functional test is to perform extensive testing at the lowest power practical at which rated temperature and pressure can be maintained.

Mr. Thornburg stated that the test should be a unique sophisticated test to prove each system can meet its design function including a demonstration of the operation of each emergency safeguards system in its operating condition.

Mr. Keppler stated that the hot functional test should furnish a time to check out operating procedures, surveillance tests and provide a training opportunity.

Mr. Miller stated that the procedure would be revised to reflect CO's comments.

E. Startup Testing

The inspector continued the review of the startup test program by examination of the startup test procedures (STP) and discussion with Messrs. Clarity (NSP) and Hobson (GE). The startup test program appears to meet FSAR commitments. The inspector found that the procedures were in the process of review by the NSP Operations Committee but had not yet been approved. The test procedures appeared to be satisfactory with the following comments and/or exceptions:

1. Hot Functional Testing (Heatup)

   The scope of the hot functional testing has not been finalized. (Section D.2.)

2. Control Rod Drive Performance - STP 2

   The applicant was asked to keep CO informed of control rod performance during startup and operating phases. The applicant stated that the scram times of approximately 29 control rods would be monitored during startup and initial operation. These arrangements have not been finalized, however.

   The inspector asked Mr. Clarity to consider performing a cold pressurized scram test of at least 20 control rods preceding initial pressurized operation. Mr. Clarity stated that cold pressurized scram testing had been performed during preoperational testing. The inspector indicated that no fuel had been in place at that time. The applicant agreed to consider additional testing after fuel loading is complete.

3. Source Range Monitor (SRM) Performance - STP 7

   The procedure to determine signal-to-noise ratio did not appear to provide sufficient assurance that an acceptable ratio ($\geq$ 3:1) would be maintained as the dunking chamber was progressively moved outward during the fuel loading. The applicant stated that the ratio would be verified for the minimum acceptable count rate (3 cps).

4. Intermediate Range Monitor (IRM) Calibration - STP 8

   The procedure did not appear to fully recognize the radial flux gradient which may be expected at initial critical with respect to the IRM initial calibration. The applicant stated that the calibration procedure would be reviewed in light of the inspector's comments.

5. Control Rod Sequence - STP 6

The inspector asked the applicant what the initial critical prediction was based upon. Mr. Hobson stated that an extrapolation of data from similar core configurations had been prepared which plotted the number of notches of control rods withdrawn at critical against the total number of fuel assemblies in each core.

6. Effects of Testing Upon Auxiliary Equipment

The inspector asked the licensee to consider the effects of extended testing during the startup testing upon auxiliary equipment such as the 250 v battery system. The applicant stated that the effects of testing upon auxiliary equipment would be considered.

F. Exit Interview

Mr. Jordan conducted an exit interview prior to departing the facility on April 24 to discuss the results of the procedure and test review. Messrs. Larson, Clarity, and Jacobson attended. The following items were discussed:

1. Operating Procedures

The inspector stated that in general the operating procedures appeared to satisfy the FSAR commitments and regulatory requirements with the exceptions described in Section B.

Mr. Larson stated that the procedures would be revised to accommodate the exceptions. The inspector inquired into whether procedures for the Emergency Plan document control existed. Mr. Larson stated that holders of documents are instructed to destroy the previous version when a new version is issued.

2. Functional Testing

Since the NSP management personnel were present during the discussion of Section D, no further comments were offered.

3. Startup Testing

The inspector discussed communications with CO regarding control rod performance and the added cold pressurized control rod scram testing (Section E). Mr. Larson agreed to communicate with Region III regarding control rod performance. Mr. Larson stated that the additional scram testing would be considered.

The inspector asked the applicant to consider the following items:

a. SRM signal-to-noise ration. (Section E.3.)

b. IRM calibration. (Section E.4.)

c. Effects of testing upon auxiliary equipment. (Section E.6.)

Mr. Larson stated that the above items would be considered.

4. Preoperational Test Results

The inspector requested that CO be notified preceding the power failure testing and secondary containment test to facilitate witnessing these tests.

The inspector asked the applicant to consider measuring the RPS neutron instrument response times in addition to the measurements already performed. (Section II.C.2.b.) Mr. Clarity stated that NSP would consider the matter further.

The inspector asked the applicant to consider additional scram testing consisting of a total of 25 timed scrams for two control rods (Section II.C.2.1). Mr. Larson stated that NSP would reconsider the testing.

5. Test Witnessing

The inspector stated that the crud observed on the steam separator dryer during its removal and the lack of precautions to prevent foreign object entry into the reactor vessel (Section II.C.3) were areas of concern.

Mr. Larson stated that NSP was analyzing the crud and would take action to improve the controls in the vicinity of the reactor pressure vessel.