MAY 2 2 1970

H. D. Thornburg, Senior Reactor Inspector
Region III, Division of Compliance

ASSIST INSPECTION - NORTHERN STATES POWER COMPANY (MONTICELLO)
DOCKET NO. 50-263

Enclosed for information is a report prepared by L. D. Denton, CO:HQ, who accompanied C. D. Feierabend, CO:III, on an announced inspection of the subject plant during the period April 14-16, 1970. The inspection was for the purpose of conducting a preoperational health physics inspection of the applicant's program as requested in your memorandum dated January 21, 1970. The majority of information contained in the enclosed report was obtained during this latest inspection; however, some carryover of information obtained during our assist inspection of February 2-4, 1970, is included for the sake of clarity and continuity between this and previous inspections of the applicant's health physics program.

The plant radiation safety program has been under development for a period of about three years. The preparation of facilities, procurement and installation of monitoring instrumentation and safety equipment, staffing and training of the radiation safety group, and orientation and instruction of other site personnel reflect substantial effort. The applicant's radiation safety and waste management procedures are comprehensive and provide an acceptable basis for a sound health physics program. The inspectors have emphasized to applicant management the importance of supervisory follow-up of implementation of the planned program to assure that it is functionally reliable when put into practice and that personnel are adhering to the program requirements. The prior training and experience of the Radiation Safety supervisory personnel at the Pathfinder facility should be of material assistance in this area.

During the inspection of February 2-4, the inspectors observed that the liquid waste monitor had been installed on a horizontally-oriented pipe spool piece and in close proximity to the floor drain sample tank, a location where high fluctuating radiation background would cause monitor sensitivity problems. Also, the installation of the flow monitor for this system was conducive to plugging from crud accumulation. The applicant agreed with our evaluation and stated that the situation would be corrected. During this inspection, it was observed that the monitoring system had been relocated to the floor below the waste tanks,

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an area of anticipated low background, mounted on a vertically-oriented pipe spool piece and had been equipped with a flush line for crud removal. This corrective action resolves our prior concerns regarding high radiation background and crud accumulation in the monitoring system.

Based on the information obtained during our two assist inspections, we have concluded that the health physics aspects of this facility have been completed in accordance with the application, provided that the outstanding items identified in the summary are properly installed and tested.

Original Signed by
H. R. Denton

H. R. Denton, Chief
Technical Support Branch
Division of Compliance

Enclosure:
Monticello Rpt

cc: J. P. O'Reilly, w/encl

OFFICE ▶	CO:TSB	CO:TSB				
SURNAME ▶	LDDenton:dm	HRDenton				
DATE ▶	5/21/70	5/ /70				

REPORT OF INSPECTION (PARTIAL)
ADDENDUM TO
CO REPORT NO. 263/70-6

Licensee: Northern States Power Company
Monticello Nuclear Generating Plant
Construction Permit No. CPPR-31
Category B

Dates of Inspection: April 14-16, 1970

Dates of Previous Inspections: March 2-3, 12-13, 1970

Inspected By: L. D. Denton 5/21/70
L. D. Denton, Health Physicist, Technical Support Branch

Reviewed By: H. R. Denton 5/21/70
H. R. Denton, Chief, Technical Support Branch

Introduction

An announced inspection of the Monticello Nuclear Generating Plant was conducted on April 14-16, 1970. L. D. Denton, Health Physicist, Technical Support Branch, accompanied the principal inspector, C. D. Feierabend, to perform a preoperational health physics audit of the facility. This report contains information obtained during the inspection concerning the applicant's health physics program and the readiness of the Emergency Plan.

Summary

The applicant is formulating detailed written procedures covering the principal health physics aspects of operation of the plant. The status of formulation, review and approval of the radiation safety procedures and the procedures and practices for liquid, gaseous and solid waste management were examined and no deficiencies were found.

The applicant stated that the process, area, and effluent monitoring systems and equipment and the solid waste handling facility would be completed, tested and calibrated where required prior to fuel loading. The status of these systems and facilities (as of April 16, 1970) was as follows:

A. Reactor Building Ventilation Exhaust (RBVE) Monitor - A system to monitor the RBVE "short stack" for particulates, iodine and noble gases has been selected and approved by NSP management but was not installed. (Section V of Details)

B. Main Stack Monitor - Installation of the main stack and the stack effluent filter banks (with demisters) was complete. The isokinetic sampling probe, sampling line, and sample control panel had not been installed but work was in progress. (Section VI of Details)

C. Air Ejector Off-Gas Monitor - The monitoring system had been installed but not checked out. This monitor will be calibrated periodically by comparison with the activity levels measured by gamma spectrometry of grab samples extracted from the off-gas line after operations begin. (Section VII of Details)

D. Area Monitors - All area monitors were installed and 17 of the 31 stations had been checked out and calibrated. (Section XII of Details)

E. Main Steam Line Monitors - These monitors had not been installed and no scheduled completion date was available at the time of the inspection. (Section VIII of Details)

F. Liquid Radwaste Monitor - This monitor had been relocated from near the floor drain sample tank area to the floor below and installation was complete. This monitor had not been calibrated but will be calibrated by means of standard solutions spiked with cesium 137. Each batch of liquid waste will be assayed prior to discharge. (Section IV of Details)

G. Discharge Canal Monitor - The sample extraction standpipes and adjacent monitor station was under construction. A completion date was not available at the time of the inspection. (Section X of Details)

H. Standby Gas Treatment System - Construction was essentially complete except for joining the system exhaust duct into the main stack ductwork. Preoperational filter testing is to be conducted by the manufacturer, CVI Corporation, but no schedule has been set. (Section IX of Details)

I. Solid Waste Handling Facility - Construction of this facility was complete except for final installation of the solid waste baler and checkout of the remote handling equipment. (Section XI of Details)

The readiness of the applicant's Emergency Plan was reviewed. Arrangements with the local hospital to provide facilities to care for contaminated patients were complete and training of the hospital nursing staff was planned for about the first week of May 1970. Ambulance service is available. Emergency communications and transportation equipment is available.

Emergency kits and equipment were available but had not been distributed. Instruction of site personnel was under way. Arrangements with State Health Department officials were incomplete, but a meeting was to be held on April 24, and a test of the plan is to be made before May 31. (Section XIII of Details)

Details

I. Scope of Inspection

The health physics audit consisted of an examination of the health and safety organization; training of personnel; health and safety procedures; solid, liquid and gaseous waste monitoring and control; area monitoring; personnel monitoring; and the status of the Emergency Plan arrangements.

II. Individuals Contacted

The persons contacted during the inspection are listed below:

C. Larson - Plant Superintendent (Operations), NSP

M. Clarity - Assistant Plant Superintendent, NSP (exit interview)

D. Bohn - Nuclear Engineer, NSP (exit interview)

L. Eliason - Radiation Protection Engineer, NSP

R. Jacobson - Plant Radiochemist, NSP

C. Philbrook - Hospital Administrator, Monticello - Big Lake Community Hospital

III. Organization

The background and experience of members of the radiation protection organization was reviewed during a previous inspection[1/]. The only staffing change for this group not previously reported has been the addition of the Plant Radiochemist.

In the absence of the Radiation Protection Engineer, L. Eliason, the Plant Radiochemist, R. Jacobson, will assume supervisory responsibility over the six health physics technicians. Mr. Jacobson is a graduate chemist with previous experience at Pathfinder, and has attended the 3-month radiochemistry course given by G-E at Vallecitos. Mr. Eliason stated that he and Mr. Jacobson will work alternate 12-hour shifts during startup of the plant to provide supervisory health physics coverage during that time. Mr. Jacobson reports to Mr. Eliason in the course of his regular duties.

1/ CO Report No. 263/69-10

Mr. Eliason stated that he plans to provide health physics coverage during routine plant operations only on the day shift since the operating staff will have received training in the health physics procedures and proper use of radiation protection equipment. However, health physics coverage will be provided on shift for any abnormal operating condition (e.g., refueling and maintenance) or unusual occurrence. Mr. Eliason also said that members of his staff can reach the site in 30 minutes in the event of an emergency.

IV. Liquid Radioactive Waste Monitoring and Control

During a tour of the plant, the inspector observed that installation of the liquid waste handling systems is essentially complete, except that the outfall canal sampling system and its monitoring station nearby is still under construction (see paragraph X, below), and checkout of the liquid waste discharge line monitor has not been completed.

During the inspection of February 2-4, the inspectors observed that the monitor for the liquid waste discharge line was installed on a horizontal spool piece and in close proximity to the floor drain sample tank (high fluctuating background). Also, a potential for flow monitor plugging from crud accumulation was observed. The applicant stated then that the monitor would be moved, the spool piece rearranged to a vertical orientation, and provision made for crud removal. On a tour of the facility during this inspection, the inspector observed that the liquid waste monitor and associated flow monitor had been removed to a location on the floor below the waste tanks, was mounted on a vertically-oriented spool piece, and that a crud accumulation flush line had been connected to the monitoring pipe to flush the crud back to the radioactive waste cleanup system.

V. Reactor Building Ventilation Exhaust Stack Monitor

During previous inspections, the inspectors held discussions with the applicant concerning the adequacy of the "short stack" Reactor Building Ventilation Exhaust (RBVE) monitor and commitments were obtained that the applicant would discuss the proposed monitoring system with G-E, and based on those discussions, NSP and G-E would decide upon the type of monitoring which would provide iodine, particulate and noble gas monitoring capability for the exhaust from the Reactor Building.

During this inspection, the RBVE monitoring system was again discussed with the applicant. Mr. Eliason stated that in discussions with G-E, it had been decided the RBVE monitoring system would consist of a flow proportional sample to be extracted from the RBVE plenum. This sample would be passed through a particulate prefilter and an activated carbon cartridge, then to a sensitive GM counter chamber and back to the

RBVE stack. Further discussion of this system with Mr. Eliason indicated that the monitor (GM counter) would be capable of measuring in the range of 0.01 to 100 mr/hr. Mr. Eliason further stated that G-E had informed him that at a release rate of 21,000 microcuries per second, this monitor would indicate a reading of 2.5 mr/hr. Mr. Eliason stated that he had asked G-E to provide him with information and data which formed the basis for the stated sensitivity range.

The licensee has not decided whether each of the three vents which flow into the RBVE stack should be monitored individually or whether a single monitoring system should be installed in the stack. Mr. Eliason stated that this would be resolved prior to fuel loading.

Mr. Eliason stated that the RBVE noble gas monitor would be calibrated using a cesium 137 liquid source, similar to the calibration which will be done for the main stack monitor. The calibration will be related to release rate on the basis of an empirical formula developed by G-E for this type of monitor. Mr. Eliason stated that before reactor operations begin, the alarm settings for this system would be set an order of magnitude lower than is expected for normal operations in accordance with recommendations from G-E.

VI. Main Stack Effluent Monitoring and Cleanup System

During a tour of the facility, the inspector observed that the main stack installation had been completed and that the high efficiency particulate air (HEPA) filter banks had been installed.

The HEPA filter banks are installed in parallel and it was observed that the stack isolation valves on the offside of each of these filter banks were in place. In response to an inquiry from the inspector, Mr. Eliason stated that the filter banks are each equipped with demisters (not visible) and that the demister drain lines are attached into the low conductivity waste sump system.

The inspector observed that the monitoring panel for the stack monitoring system had been received and was awaiting installation. Also, the stack sampling line had not been installed at the time of the inspection, but work was in progress. Mr. Eliason stated that the stack sampling line would be of stainless steel approximately one inch in outside diameter and attached to an isokinetic probe in the stack at a point approximately 10 stack diameters above the lowest input to the stack at the stack base. In further discussion, Mr. Eliason stated that the stack flow will be approximately 4,000 cfm and that this flow would be made up of approximately 170 cfm from the air ejectors with the remainder of the flow made up of dilution air from the Turbine Building.

It was observed that the isokinetic probe and the sample delivery lines had not been installed at the time of the inspection. However, Mr. Eliason stated that construction and installation of this equipment are expected to be completed far in advance of fuel loading. He also stated that calibration in this system will be conducted prior to fuel loading. In addition, the "two-in-series" noble gas monitors will be calibrated with a cesium 137 liquid source similar to the method of calibrating the RBVE noble gas monitor.

Mr. Eliason stated that main stack particulate and iodine samples will be collected from the probe level (to prevent sample delivery line losses) on at least a weekly basis and counted in the chemistry laboratory for radioactivity content. He also stated that the main stack monitoring system would be calibrated using grab samples obtained from the air ejector off-gas system sampling panel.

VII. Air Ejector Off-Gas Monitoring

During a tour of the facility, the inspector observed that the air ejector monitoring system is permanently installed on an external wall of the air ejector room. This system consists of a vertically-oriented spool piece on which three individual monitors (GM counters) are mounted. Mr. Eliason stated that two of the monitors are part of the air ejector off-gas monitoring system and a third monitor is provided for use in flux tilt tests for locating failed fuel assemblies. It was observed that installation of these monitors was complete. Mr. Eliason stated that this system was ready for check out and calibration; however, the monitor testing program schedule had not been completed at the time of the inspection.

VIII. Main Steam Line Monitoring System

During the tour of the facility, the inspectors observed the status of work on the main steam lines and the main line monitors. Installation of the main steam lines was nearing completion, but the main steam line monitors had not been installed.

IX. Standby Gas Treatment System

The inspectors observed the status of completion of the Standby Gas Treatment System (SGTS). This system is located in a separate room adjacent to the reactor building ventilation exhaust plenum. The SGTS consists of two separate filter banks installed one above the other. It was observed that the system is custom-built by CVI, Division of Pennwalt Corporation, Columbus, Ohio. Mr. Eliason stated that the filters installed in the system are absolute filters and activated charcoal filters supplied by Barnaby-Cheney Corporation. Mr. Eliason further stated that these filters would be tested by the CVI Corporation but that no time schedule had been established yet for the tests.

The inspector observed that the SGTS installation was complete except for joining it to the main stack exhaust system. Mr. Eliason stated that the final checkout and testing of the system would be completed during the first week of May 1970 as a best present estimate.

X. Discharge Canal Liquid Sampling System

Mr. Eliason and the inspectors toured the location of the canal sampler system and observed the status of work in progress. The inspectors observed that the canal monitoring system was under construction at the time of the inspection. However, Mr. Eliason described the arrangement of the sampler and the controls which will be exercised over that system, as follows: Four 13-foot long standpipes will be spaced across the width of the canal. Samples from the standpipes will be drawn into a 30-gallon capacity tank located in a monitor house immediately opposite the standpipes on the bank of the discharge canal. Mr. Eliason stated that the 30-gallon tank will be equipped with two 1.5" x 1.5" sodium iodide crystal detectors immersed in the tank which will provide a capability for measuring concentrations on the order of 10^{-7} microcuries per milliliter. Mr. Eliason stated that readout and alarms for the detectors will be in the control room.

The inspectors inquired as to the controls of liquid waste releases which would be instituted during the time the cooling towers are in use. In response, Mr. Eliason stated that the radioactive discharge line valves are interlocked with the circulating water pumps in such a manner that when the circulating water pumps are inoperative, liquid waste release is automatically prevented. The liquid waste discharge valves are also connected into the cooling tower pump systems in such a way that when the cooling tower pumps are running, the discharge valves can not be opened. Alternately, if the discharge valves are open and the cooling tower pumps are started, the discharge valves will automatically close. Mr. Eliason stated that each batch of liquid wastes will be sampled prior to release and will be discharged to the canal above the canal monitoring system so that the liquids will be subjected to this final monitoring stage.

XI. Solid Radioactive Waste Handling

The solid radwaste handling procedures and facility operating manual have been drafted (Section B.7.3 of the Plant Operating Manual) but final approval of this portion of the manual by the Operations Committee is still pending.

An examination of the solid radwaste facility by the inspector showed that construction was almost complete and was as described in the draft manual. Mr. Eliason said that the only outstanding items in this facility were installation of the solid waste baling machine and testing of the remote handling equipment.

XII. Area Monitors

The area radiation monitoring system (31 monitoring stations) had been installed at the time of the inspection and 17 of the 31 stations had been checked out and calibrated.

Mr. Eliason said that the area monitors are calibrated by means of a G-E-designed calibrator which contains 350 microcuries of cobalt 60. The detectors must be removed from their mounting brackets and inserted into the calibrator during the calibration. The source-detector configuration within the calibrator is such that the detectors can be exposed to a maximum radiation field of 220 mr/hr with the 350 microcurie source. The inspector observed that the area monitors have an upper range of 1,000 mr/hr and questioned Mr. Eliason concerning how the linearity and accuracy of response of the detectors in the upper ranges would be determined. Mr. Eliason stated that he was aware of this limitation of the calibrator and has ordered a 10 millicurie cobalt 60 source which will be used for calibration of the upper scales. The 10 millicurie source will provide a sufficiently high radiation field to calibrate the detectors on all ranges.

XIII. Emergency Plan

The Monticello Plant Emergency Plan was previously reviewed with the applicant during the CO inspection of March 2, 3, 12, and 13, 1970, at which time the documentation for the plan itself was considered satisfactory in meeting the FSAR commitments[2/]. However, at that time, the applicant had not completed arrangements for final implementation of the Emergency Plan and had not completed related documentation of the Operations Manual (OM) in the areas of radiation safety, patient care, and abnormal procedures. Further information as to the readiness of the plan and in implementing the health physics program was obtained during this inspection and is presented below.

A. Radiation Safety Procedures

The individual sections of these procedures, which will be incorporated in the OM as Section E.2, have been written and are in various stages of review and approval by the Operations Committee. The radiation safety engineer is a member of this Committee. The content of the 11 sections of these procedures and their status of completion and approval are summarized in Enclosure 1. The procedures, when viewed in conjunction with the Emergency Plan and Patient Care procedures, provide the essential elements identified in PI 2015.10.

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

B. Patient Care

Patient care procedures have been written and were approved by the Operations Committee on February 4, 1970 for incorporation in the OM as Section E.4. These procedures cover detection and handling of patients in-plant, describe the hospital assistance plan operation, and provide pertinent information regarding medical treatment of contaminated patients. Mr. Eliason stated that the patient care plan has been discussed with Mr. C. W. Philbrook, Hospital Administrator, Monticello-Big Lake Community Hospital, Monticello, Minnesota and that arrangements have been made with the hospital for assistance.

During the inspection, L. Denton and Mr. Eliason visited the hospital and were conducted on a tour by Mr. Philbrook of the facilities which would be made available to NSP in the event of an emergency. These facilities are located on the ground floor at the rear of the hospital at the emergency entrance and consist of the emergency treatment room and the nurses' lounge. Both of these rooms are in close proximity to x-ray and laboratory areas, all of which can be isolated from other hospital areas by appropriate barriers. Mr. Philbrook stated that additional space on the second floor of the hospital above the emergency treatment area could be made available as needed. Mr. Philbrook stated that the basement below the emergency area is vacant and entry would be controlled and that the second floor above the area could be evacuated and controlled as necessary. Messrs. Philbrook and Eliason stated that all the necessary supplies and surveying and monitoring equipment noted in the Patient Care Plan would be stored in the emergency area for easy access. Mr. Philbrook reiterated to the inspector the hospital's previous commitment to NSP management to cooperate in establishing and carrying out the NSP Patient Care Plan.

C. Training of Hospital and Ambulance Service Staffs

While at the hospital and in the presence of the inspector, Mr. Eliason made arrangements with Mr. Philbrook for NSP Radiation Safety personnel to conduct morning (for the night shift) and evening (for the day shift) training sessions for the nursing staff during the latter part of April or early May (schedule to be worked out).

After leaving the hospital, Mr. Eliason stated that he has contacted the two local ambulance services, Big Lake-Monticello Ambulance Service and Ambulance Service of Wright County, both of which are owner-driver services and neither had expressed any reluctance toward responding to an emergency at the site.

Mr. Eliason further stated that he had discussed with one of the owner-drivers, the precautions to be taken in transporting contaminated patients; namely, to leave the handling of the injured to site personnel who will accompany the injured, wear the protective clothing and personnel monitoring equipment provided by NSP, and that NSP will assume responsibility for decontamination of the ambulance. Mr. Eliason said that this was acceptable to the one individual contacted and he now plans to hold a similar discussion with the other ambulance service owner-driver as soon as possible so that both services can be used if necessary or in the event that only one is available when called.

D. Training of the Plant Staff

As noted previously[3/], Mr. Eliason repeated that training of site personnel in the Emergency Plan and the health physics practices for the plant is under way. Included in the training program for coping with injuries will be instruction in personnel decontamination and a 10-hour course in first aid. This training will be given to all Radiation Safety technicians, shift supervisors and maintenance supervisors. Mr. Eliason stated that the emergency kits required by Section VI of the Emergency Plan (draft) are being assembled and will be placed at the locations designated in the Plan before May 1, 1970.

E. Emergency Surveying and Personnel Monitoring Equipment

Mr. Eliason stated that certain surveying and monitoring equipment will be placed at strategic locations around the plant, at the two emergency assembly points and at the hospital as follows:

Hospital

10 - Victoreen Model 362 (indirect reading) pocket dosimeters
1 - Victoreen Minometer II dosimeter charger
1 - Victoreen Model 490 Thyac

Each Emergency Assembly Point

10 - Victoreen Model 362 pocket dosimeters
1 - Victoreen Minometer II dosimeter charger
1 - Victoreen Model 490 Thyac
1 - Staplex "Hi-Vol" air sampler with filters

3/ CO Report No. 263/70-5, Section F.3.b(3).

Selected Plant Locations (as shown)

9 - ICN Model CP-4A "Cutie Pie" - distributed around the plant
5 - Staplex "Hi-Vol" air samplers - distributed around the plant
1 - Victoreen Model AGB-10KG-SR - "Radgun" - Control Room

A number of additional portable alpha, betta-gamma, and neutron monitoring instruments (Enclosure 2) are maintained in the Radiation Protection Office and Mr. Eliason stated that these could be used by the emergency crews if they could be reached at the time of the emergency. The emergency instrumentation, except personnel dosimeters, are scheduled for calibration and needed maintenance at a 35-day frequency.

F. Emergency Transportation and Communications Equipment

Mr. Eliason said that the Control Room is equipped with a radio transmitter and receiver by which communications with outside organizations or emergency units can be maintained. He further stated that NSP has four cars equipped with radios and nine trucks equipped with radios and portable power supplies which will be made available for use in an emergency. Mr. Eliason said that the Control Room and the radio-equipped cars and trucks can all converse with each other and the Control Room can monitor and converse with external units, e.g., the State Police and the Sheriff's Office and any other such organizations with radio transmitter-receiver equipment.

G. Emergency Plan Arrangements with Local and State Officials

Mr. Larson stated that the State Health Department has requested that the State be notified of any incident or accident, even if confined to in-plant areas, for which AEC is notified or the nearest AEC Operations Office REAT is requested or responds. Mr. Larson stated that NSP now plans to notify the AEC, State Health Department, Wright County Sheriff's Office and NSP top management of any emergency for which notification of AEC is required.

Messrs. Larson and Eliason stated that NSP can give the State (and others) a relatively accurate estimate of any offsite hazard resulting from an onsite emergency, including quantities and concentrations of activity accidently released in gases and liquids. However, so far they have not been able to complete arrangements with the State Health Department as to who will assume responsibility for notification of other local and State organizations, e.g., Civil Defense, Minneapolis-St. Paul Water Supply officials, FWPCA, etc. Mr. Eliason stated that NSP has provided the State Health Department with a copy of the site

Emergency Plan for review and comment and a recent contact with the State Health Department indicates that the State has no problems with it. Mr. Eliason speculated that lack of response from the State may be due to the fact that the State-wide Emergency Plan has not been completed.

During the inspection, Mr. Eliason contacted the State Health Department and made arrangements for a meeting with them for April 24, 1970 to further discuss the NSP Emergency Plan. (The responsible AEC inspector was invited to attend, and accepted the invitation.)

During his contacts with the State Health Department, Mr. Eliason also obtained the names and telephone numbers of two State alternates who could be contacted in an emergency, since the telephone number of only one person had been listed as the State Health Department contact.

H. Test of the Emergency Plan

During the exit interview, Mr. Larson stated that they plan to conduct a test of the Emergency Plan before May 31, 1970. He stated that this test would include the communication systems, evacuation system, and obtaining offsite samples, e.g., from the river, but that he does not consider the test to be part of the preoperational testing program. Mr. Larson said that he would formulate the general scope of the test before the April 24 meeting with the State and would make a copy of the test plan available to the responsible AEC inspector.

XIV. Exit Interview

On April 16, 1970, the inspectors met with those NSP personnel identified in Section II, to discuss the results of the inspection.

The inspectors reviewed the areas covered during the inspection and stated that no deficiencies in the radiation safety and waste handling procedures and plans for implementing the program had been identified. However, it was pointed out that work remained to be done in completing the installation, testing and calibration of the various process and effluent monitoring systems and that supervisory review of the adequacy of functioning of the health physics program would be necessary, particularly during the early stages of plant operation. Mr. Larson stated that completion of the facilities and installation, checkout and calibration of the various monitoring systems would be completed prior to fuel loading. In this regard, Mr. Eliason announced that NSP top management had approved the "short stack" RBVE monitoring system. In addition, Mr. Eliason repeated a previous statement that "round-the-clock" health physics supervisory personnel would be present at the site during startup and shakedown of the plant to assure the proper implementation of the health physics program.

Mr. Feierabend emphasized the need for NSP to complete arrangements with external organizations, particularly the State Health Department, for the Emergency Plan. Mr. Larson stated that NSP had had some difficulty in making arrangements individually with outside organizations and consequently had invited representatives of the various organizations to meet at the site during the previous week. Mr. Larson stated that 13 of the 16 individuals invited to attend did attend, but principal among those absent was a State Health Department representative. Consequently, he had arranged a meeting for April 24 with the State Health Department to discuss the Emergency Plan. The AEC principal inspector for Monticello and his supervisor were invited to attend the meeting and the invitation was accepted.

In further discussion of the Emergency Plan, the possibility was brought up of conducting a test of the Plan, complete with an evacuation drill, a test of the communications system, contacts with outside organizations, and sample collection and laboratory analysis of the samples. Mr. Larson stated that such a test would be planned and conducted before May 31. He emphasized, however, that he did not consider the Emergency Plan test to be a preoperational test. He further stated that he would formulate the general scope of the test and would provide the AEC inspector with a copy the following week at the meeting with the State Health Department.

NORTHERN STATES POWER COMPANY
MONTICELLO NUCLEAR GENERATING PLANT
RADIATION SAFETY PROCEDURES - SUMMARY AND STATUS

Section	Title and Summary of Contents	Status as of 4/16/70
I	General - Radiation safety philosophy; assignment of responsibility to individuals, supervisors and the radiation safety group.	Approved 2/7/70
II	Radiation Safety Standards - Personnel exposure limits; radioactivity concentration limits; emergency exposure philosophy and limits.	Approved 1/14/70
III	Radiation Area Control - Definitions of areas; radiation and contamination limits; posting, labelling and control devices; access to controlled areas; general procedures; Radiation Work Permits.	Approved 2/11/70
IV	Monitoring - Radiation level, liquid, airborne and contamination monitoring locations and frequencies; action levels; counting room use; use of various portable instrumentation; instrument calibrations	To be approved before fuel loading
V	Personnel Control and Monitoring - Permissible routine exposure limits; personnel contamination limits; use of exposure monitoring devices; bioassays; personal surveys; use of protective clothing and equipment; personal decontamination.	Approved 1/15/70
VI	Records and Reports - Will cover all internal recordskeeping and reporting, e.g., to AEC, State Health Department, NSP management, etc.	In preparation. Completion awaiting final Tech Specs
VII	Equipment Control - Equipment radiation and contamination limits; tagging, labeling and marking; storage; in-plant movement, release and disposal.	Approved 1/15/70

ection	Title and Summary of Contents	Status as of 4/16/70
VIII	Radioactive Materials Handling - General philosophy and requirements; in-plant movement; storage; decontamination procedures; source and sample handling; waste handling.	Approved 1/17/70
IX	Offsite Shipments of Radioactive Materials General requirements of shipped; regulatory agency requirements; classification of wastes; container specifications; quantity and radiation limits.	Approval before 5/1/70
X	Radiation Safety Training Manual - Fundamentals of atomic and nuclear physics; types of radiation; radioactive decay; basic health physics principles; exposure and biological effects; exposure limits; monitoring.	Approved 4/14/70
XI	Investigation and Reporting of Radiation Incidents and Occurrences - Internal procedures for handling incidents; breach of safety practice; reporting incidents.	Approved 2/11/70

PERSONNEL MONITORING INSTRUMENTS

Type of Instrument	Number	Radiation Detected	Sensitivity Range	Window Thickness	Use	Calibration Frequency
Bendix Model 06-862 Pocket Dosimeters (Self Reader)	100	γ	0-200 mr	-	Individual Dosimetry	Quarterly
Bendix Model 906-0	4		-	-	Charging Pocket Dosimeter	None
Bendix Model 06-608 Pocket Dosimeter (Self Reader)	10	γ	0-10 R	-	Individual Dosimetry	Quarterly
Victoreen Model 362 Pocket Dosimeter (Indirect Reader)	100	γ	0-200 mr	-	Individual Dosimetry	Quarterly
Victoreen Minometer II Model 687C	1		-	-	Charging Pocket Dosimeters	None
R.S. Landauer, Jr. Co. Film Badge	-	β, γ	0-Several Hundred rem	-	Individual Dosimetry	Each Batch
		n_f	0-10 rem			
		nt	0-300 rem			

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PORTABLE MONITORING INSTRUMENTS

Type of Instrument	Number	Radiation Detected	Sensitivity Range	Window Thickness	Use	Calibration Frequency
I.C.N. Instrument Div Cutie Pie Model CP 4A	9	β, γ	0-2500 mr/hr	0.45 mg/cm^2	Survey Monitoring	35 days
I.C.N. Instrument Div Model CP-tP-1A	1	β, γ	0-5000 r/hr	.002 inches	Survey Monitoring	35 days
Victoreen Radector III Model 2035	3	β, γ	.1 mr/hr-1000 r/hr	20 mg/cm^2	Survey Monitoring	35 days
Victoreen Radgun Model AGB-10KG-SR	1	β, γ	.01 mr/hr-10,000 r/hr	20 mg/cm^2	Survey Monitoring	35 days
Victoreen Thyac III Model 490	6	β, γ	0-80,000 cpm	30 mg/cm^2	Survey	35 days
Victoreen Model 444 with probe Model 489-4	1	α, β, γ	0-300 R/hr 0-300 mr	1.5 mg/cm^2	Survey Measurement	35 days
Eberline Teltector Model 6112	1	β, γ	0.1 mr/hr-1000 r/hr	30 mg/cm^2	Survey	35 days
Eberline PRM-4 with Model AC-3 Scintillation Alpha Detector	1	α	0-500,000 cpm	1.5 mg/cm^2	Survey	35 days
Eberline Portable Neutron Rem Counter Model PNR-4	1	n	0-5,000 mr/hr	9" Cadmium Loaded Polyethylene	Survey Monitoring	35 days
Eberline Fast-Slow Neutron Counter Model PNC-4	1	n	0-500,000 cpm	.03" Cadmium	Survey	35 days
Eberline Radiation Monitor Model RM-3C with HP-177 Probe (Frisker)	6	β, γ	0-50,000 cpm	30 mg/cm^2	Survey Monitoring	35 days
Landsverk Roentgen Meter Set Model [illegible]4	1	β, γ	0-1000 R		Measurement	-

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COUNTING ROOM EQUIPMENT

Type of Instrument	Number	Radiation Detected	Sensitivity Range	Window Thickness	Use
Nuclear Chicago Integral Well Counter Model RIDL with Harshaw Model 7SF8 photomultiplier tube	1	γ	10^6 cpm	>150 microgm/cm^2	Counting
Nuclear Measurement Internal Proportional Counter Model DS-1T with PCC-11T (2")	1	α, β, γ	over 10^6 cpm	-	Counting
Nuclear Measurement End Window Proportional Counter Model DS-1T with PCC-11T (2")	1	α, β, γ	over 10^5 cpm	1 mg/cm^2	Counting
Nuclear Chicago Automatic Low Background Gas Flow Planchet Counting System (Automatic Sample Changer)	1	β, γ	10^6 cpm	-	Counting
Nuclear Data 512 Channel Gamma Spectrometer	1	γ			Analyzing

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STATIONARY MONITORING INSTRUMENTS

Type of Instrument	Number	Radiation Detected	Sensitivity Range	Use	Calibration Frequency
Eberline Hand and Foot Monitor Model HFM-2	1	β, γ	0-20,000 cpm	Monitoring	35 days
Eberline Laundry Portal Monitor Model LM-2	1	β, γ	0-2,000 cpm	Monitoring	35 days

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AIR SAMPLING EQUIPMENT

Type of Instrument	Number	Radiation Detected	Sensitivity Range	Window Thickness	Use	Calibration Freuqency
Nuclear Measurement CAM Model AM-3D	4	β, γ	10-1,000,000 cpm	5.6 mg/cm^2	Air Monitoring	35 days
Gelman Inst. Low Volume Air Sampler Model 26001-1	1	α, β, γ (in counting instruments)	See Sensitivity of Counting Instruments		Collect Sample on Filter 1 cfm	-
Staplex Co High Volume Air Sampler	7	α, β (In counting instruments)	See Sensitivity of Counting Instruments		Collect Sample on filter to 30 cfm	-

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