

NOV 19 1971

Docket No. 50-263

ENVIRO - FILE (NEPA)

Northern States Power Company
ATTN: Mr. Arthur V. Dienhart
Vice President, Engineering
414 Nicollet Mall
Minneapolis, Minnesota 55401

Gentlemen:

In accordance with section E.3 of the Commission's regulations implementing the National Environmental Policy Act of 1969 (NEPA), appendix D of 10 CFR Part 50 (Appendix D) you furnished to the Commission by letter dated October 15, 1971, a statement of reasons, with supporting factual submission, why Provisional Operating License No. DPR-22 for the Monticello Nuclear Generating Plant should not be suspended, in whole or in part, pending completion of the NEPA environmental review.

The Director of regulation has considered your submission in light of the criteria set out in section E.2 of Appendix D, and has determined, after considering and balancing criteria in section E.2 of Appendix D, that operation of the Monticello Nuclear Generating Plant authorized pursuant to Provisional Operating License No. DPR-22 should not be suspended pending completion of the NEPA environmental review.

Further details of this determination are set forth in a document entitled "Discussion and Findings by the Division of Reactor Licensing, U. S. Atomic Energy Commission, Relating to Consideration of Suspension Pending NEPA Environmental Review of the Provisional Operating License No. DPR-22 for the Monticello Nuclear Generating Plant, Docket No. 50-263," copy enclosed.

OFFICE ▶						
SURNAME ▶						
DATE ▶						

A copy of a related notice which has been forwarded to the Office of the Federal Register for publication is also enclosed.

Sincerely,

Original signed by
F. Schroeder

for


Peter A. Morris, Director
Division of Reactor Licensing

Enclosures:

- 1. Discussion & Findings
- 2. Federal Register Notice

cc: Mr. Gerald Charnoff
 Shaw, Pittman, Fotts, Trowbridge
 & Madden
 910 17th Street, N.W.
 Washington, D.C. 20006

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UNITED STATES OF AMERICA
ATOMIC ENERGY COMMISSION

In the Matter of)
)
NORTHERN STATES POWER COMPANY) Docket No. 50-263
)
(Monticello Nuclear Generating Plant))

DETERMINATION NOT TO SUSPEND OPERATION OF THE
MONTICELLO NUCLEAR GENERATING PLANT AUTHORIZED PURSUANT TO DPR-22
PENDING COMPLETION OF NEPA ENVIRONMENTAL REVIEW

Northern States Power Company (the licensee) is the holder of Provisional Operating License No. DPR-22 (the license), issued by the Atomic Energy Commission on September 8, 1970. The license authorizes the licensee to operate a boiling water nuclear power reactor designated as the Monticello Nuclear Generating Plant, at the licensee's site in Wright and Sherburne Counties, Minnesota. The facility is designed for initial operation at approximately 1670 megawatts (thermal).

In accordance with section E.3 of the Commission's regulations implementing the National Environmental Policy Act of 1969 (NEPA), Appendix D of 10 CFR Part 50 (Appendix D), the licensee has furnished to the Commission a written statement of reasons, with supporting factual submission, why the license should not be suspended, in whole or in part, pending completion of the NEPA environmental review. This statement of reasons was furnished to the Commission on October 18, 1971.

The Director of Regulation has considered the licensees' submission in the light of the criteria set out in section E.2 of Appendix D, and has determined, after considering and balancing the criteria in section E.2 of Appendix D,

that operation of the Monticello Nuclear Generating Plant authorized pursuant to DPR-22 should not be suspended pending completion of the NEPA environmental review.

Further details of this determination are set forth in a document entitled "Discussion and Findings by the Division of Reactor Licensing, U. S. Atomic Energy Commission, Relating to Consideration of Suspension Pending NEPA Environmental Review of the Facility Operating License for the Monticello Nuclear Generating Plant, Docket No. 50-263".

The determination herein and the discussion and findings herein referred to above do not preclude the Commission, as a result of its ongoing environmental review, from continuing, modifying or terminating the license or from appropriately conditioning the license to protect environmental values.

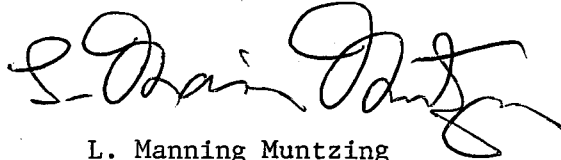
Any person whose interest may be affected by this proceeding, other than the licensee, may file a request for a hearing within thirty (30) days after publication of this determination in the FEDERAL REGISTER. Such a request shall set forth the matters, with reference to the factors set out in section E.2 of Appendix D, alleged to warrant a determination other than that made by the Director of Regulation and shall set forth the factual basis for the request. If the Commission determines that the matters stated in such request warrant a hearing, a notice of hearing will be published in the FEDERAL REGISTER.

The licensee's statement of reasons, furnished pursuant to section E.3 of Appendix D, as to why the licensee should not be suspended pending completion of the NEPA environmental review, and the document entitled "Discussion and

Findings by the Division of Reactor Licensing, U. S. Atomic Energy Commission, Relating to Consideration of Suspension Pending NEPA Environmental Review of the Provisional Operating License for the Monticello Nuclear Generating Plant, Docket No. 50-263" are available for public inspection at the Commission's Public Document Room, 1717 H Street, N. W., Washington, D. C. and at the Environmental Resource Center, Minneapolis Public Library, 1222 S. E. 4th Street, Minneapolis, Minnesota 55414. Copies of the "Discussion and Findings" document may be obtained upon request addressed to the Atomic Energy Commission, Washington, D. C. 20545, Attention: Director, Division of Reactor Licensing.

Dated at Bethesda, Maryland this 18th day of November, 1971.

FOR THE ATOMIC ENERGY COMMISSION



L. Manning Muntzing
Director of Regulation

DISCUSSION AND FINDINGS BY THE
DIVISION OF REACTOR LICENSING
U.S. ATOMIC ENERGY COMMISSION
RELATING TO
CONSIDERATION OF SUSPENSION
PENDING NEPA ENVIRONMENTAL REVIEW
OF THE PROVISIONAL OPERATING LICENSE DPR-22
FOR THE MONTICELLO NUCLEAR GENERATING PLANT E-5979

AEC DOCKET NO. 50-263

November 18, 1971

1.0

INTRODUCTION

On September 9, 1971, the Atomic Energy Commission (AEC) published in the Federal Register a revised Appendix D to 10 CFR Part 50, setting forth AEC's implementation of the National Environmental Policy Act of 1969 (NEPA). Paragraph E(3) of revised Appendix D generally requires a holder of an operating license issued after January 1, 1970 but before September 9, 1971, to furnish to the AEC within 40 days of September 9, 1971, a written statement of any reasons, with supporting factual submission, why with reference to the criteria in paragraph E(2) of revised Appendix D the permit should not be suspended, in whole or in part, pending completion of the NEPA environmental review specified in Appendix D.

On January 19, 1971, after a public hearing, the AEC issued Provisional Operating License DPR-22 to the Northern States Power Company (NSP) for the Monticello Nuclear Generating Plant E-5979. On October 15, 1971, NSP filed with the AEC the statement required by paragraph E(3) of Appendix D.

1.1

Determination

In accordance with the requirements of Section E of Appendix D, we have determined that Provisional Operating License DPR-22 for the Monticello Nuclear Generating Plant E-5979 should not be suspended, in whole or in part during the review period, pending completion of the NEPA environmental review specified in Appendix D.

A formal "Determination" to this effect is being forwarded to the Federal Register for publication. In reaching this determination, we have considered and balanced the factors in Paragraph E(2) of Appendix D.

1.2 Background

In July 1966, NSP filed an application for a construction permit for the Monticello Nuclear Generating Plant with the AEC. An extensive review of the application was made by the AEC's regulatory staff and by the Advisory Committee on Reactor Safeguards. A public hearing was held before a three-member Atomic Safety and Licensing Board at Buffalo, Minnesota on May 25 and 26, 1967. On June 19, 1967, Construction Permit CPPR-31 was issued, to build a boiling water reactor with a power level up to 1670 MWt. In November 1968, NSP submitted an application to the AEC for an operating license and submitted the Final Safety Analysis Report (FSAR). Again an extensive review of the application was made by the AEC's regulatory staff and by the Advisory Committee on Reactor Safeguards. At the Commission's initiative, another public hearing was held before an Atomic Safety and Licensing Board (ASLB) beginning in April 1970 and continuing intermittently until November 19, 1971. Interested members of the Public were admitted as parties. On August 25, 1970, the ASLB authorized issuance of an interim provisional operating

license allowing fuel loading and operation of the reactor at power levels not in excess of 5 MWt, providing the reactor head was not installed, and on September 8, 1970, the AEC issued a provisional operating license permitting such operation. NSP started fuel loading of the reactor soon after and initial criticality was achieved on December 10, 1970. Following the ASLB's favorable decision issued on January 15, 1971, the AEC issued a full power provisional operating license on January 19, 1971, but included a restriction limiting power to 5 MWt until acceptable performance of the feedwater pumps was verified by the AEC. On February 18, 1971, the AEC approved operation of the reactor at power levels up to 1670 MWt. On June 30, 1971, testing of the plant was completed and the plant was considered to be in service.

Concurrent with the application to the AEC for an operating license, NSP made applications to the Minnesota Water Pollution Control Commission (now Minnesota Pollution Control Agency - MPCA) for permission to discharge heated water and other plant waters to the Mississippi River, and to the Minnesota Department of Conservation (now Minnesota Department of Natural Resources - MDNR) for permission to appropriate cooling water from the Mississippi River and to construct intake and discharge structures. In May, 1969 MPCA approved the temperature limit on water discharge

restricting the temperature rise to 5°F over the ambient river temperature after mixing.^{1/}

In August 1968, MPCA decided to establish State standards for release of radioactive wastes from the Monticello Plant. In June 1969, MPCA issued permits covering both water discharge and radioactive waste releases. NSP filed suit in the United States District Court, maintaining that MPCA did not have jurisdiction to set limits on radioactive waste releases. On December 22, 1970, the Court ruled that the Federal Government (AEC) has the exclusive right to regulate nuclear generating facilities. In January 1971, the State of Minnesota appealed; however, in September 7, 1971, the U.S. Eighth Circuit Court of Appeals sustained (2-1) the ruling of the District Court of December 1970. The State of Minnesota is reported to be seeking U.S. Supreme Court review of the Eighth Circuit's decision.

While litigation was proceeding between NSP and MPCA on the issue of jurisdiction over nuclear power plants and radioactive discharges, NSP and MPCA agreed to proceed with the possible installation of additional means to reduce off gas releases from the plant, as had been recommended by MPCA. On April 1, 1971,

^{1/} Exhibit 5, Monticello show cause statement filed October 15, 1971.

NSP submitted a request for approval of the proposed gas storage system to the AEC.^{2/} This request was further amended on October 15, 1971 and is currently under review.^{3/}

2.0 COMPLETION OF NEPA REVIEW

In accordance with revised Section B of Appendix D to 10 CFR Part 50, NSP expects to file an environmental report on November 8, 1971. The time necessary for the completion of the NEPA review for the Monticello Plant is estimated to be 12 months. The criteria set forth in Section E of Appendix D have been evaluated with this approximate time period in mind. That is, the environmental impact of continuing operation, the foreclosure of alternatives of the type that might be required as a result of the full NEPA review, and the effects of suspending operation for 12 months have been considered. Should the actual NEPA review of the case exceed 12 months, such a longer time period would not add significantly to the environmental impact which operation of the plant has caused to date, but would substantially increase the cost of suspended operation if the plant were shutdown. We have taken these considerations into account in balancing the factors specified in Paragraph E of Appendix D to 10 CFR Part 50, and have concluded that if a significantly longer time period

^{2/} Monticello Technical Specifications Change No. 2 filed April 1, 1971.

^{3/} Monticello Technical Specifications Amendment Change No. 2 filed October 15, 1971.

were required to complete the NEPA review, it would not affect our determination that the operating license of the Monticello Plant should not be suspended at this time.

3.0 ENVIRONMENTAL EFFECTS

3.1 Radiological Effects

NSP has submitted the first six-month operating report covering the period from December 10, 1970 (initial criticality date) to June 30, 1971.^{4/} This report lists the radioactive wastes released during the operating period. The Division of Compliance has selectively audited these reported releases and found them to be accurate.

3.1.1 Gaseous Effluents

Gaseous effluents may originate from the steam air ejectors, plant startup, steam turbine gland seal leakage, containment purging, High Pressure Core Injection turbine testing and plant ventilation systems. For normal operation, we have calculated that the contribution to the dose at the site boundary from these sources, excluding the air ejector, is less than 5 mrem/yr; which is consistent with the Commission's "low-as-practicable" requirements and with the numerical guides given in the proposed Appendix I to 10 CFR Part 50.

The air ejector is by far the greatest source of radioactive gaseous effluent. The gaseous radwaste system provides a delay

^{4/} Monticello Six-Month Operating Report No. 1, filed August 5, 1971.

time of 30 minutes for decay of the radioactive fission and activation gases prior to release. These gases are then released through a 100-meter stack after passing through high efficiency filters. During the first six months of operation of this plant, the releases were small fractions of the releases permitted by the Technical Specifications; 0.028% for the noble gases and 0.12% for iodines and particulates. However, commencing in August, the source of activity has increased considerably. The reason for this increase is deterioration in the performance of the fuel. Based on experience to date at other reactors, this activity will probably continue to increase. At present, the gaseous release is at approximately 4% of the limit specified in the Technical Specifications.

As noted above, on April 1, 1971, NSP submitted to the AEC for review the design of a proposed gaseous radwaste system, which by the addition of holdup tanks and other related equipment, the function of which would be to reduce substantially the stack activity release rate. Because of the time required for review by the AEC compared to time for equipment delivery and for construction, it is unlikely that this off-gas system modification can be implemented during the NEPA review period.

On July 14, 1971 an unexpected gaseous release occurred at a rate of about 25,000 $\mu\text{Ci}/\text{sec}$ through the main stack and about

2,000 $\mu\text{Ci}/\text{sec}$ through the reactor building vent.^{5/} This release lasted for approximately 30 minutes. Our analysis has shown that the integrated dose at the site boundary was negligible. We have informed NSP that means should be provided to mitigate such uncontrolled releases. NSP has agreed to review the system design with the objective that the incident will not recur, and to provide means to control releases from the reactor building vent.

Based on the amount of gaseous radioactivity that the Monticello plant is expected to emit during the NEPA review period, the proposal by NSP to install a waste gas handling system, NSP's plans to mitigate uncontrolled releases, and the fact that plant operation will not foreclose incorporation of other necessary additions or modifications that may be dictated as a result of a complete NEPA review, we conclude that the incremental effect of gaseous releases on the environment during the period NEPA review is acceptable.

3.1.2 Liquid Effluents

The liquid radwaste system is designed to provide the maximum practical capability for recycling process wastes to the reactor

^{5/} Letter from NSP to P. A. Morris of the AEC, Reporting of Unusual Occurrence, dated July 23, 1971.

system and thereby reduce the need to discharge radioactive liquids to the environment. Liquid wastes are processed on a batch basis. The radioactive and chemical contaminants are removed from the liquid waste streams either by filtration, or by filtration followed by mixed deep bed demineralizers before the liquid is returned to the primary system. Certain low level liquid radwastes are pumped to the discharge canal where the wastes are diluted with the circulating cooling water before discharge to the river.

Except for one occurrence, the radiation level of liquid effluents has been close to background, and therefore negligible. On July 15, 1971, as a result of an incident involving an uncontrolled release of gaseous radioactivity (see Section 3.1.1), the existing meteorological conditions were such that the released radioactive gas came into contact with the water in the cooling towers. Radioactive gases were dissolved in the water raising the activity of the water in the discharge canal to as high as 2.5×10^{-6} $\mu\text{Ci/cc}$ for a short period of time. However, the amount of radioactivity discharged during that short period of time was negligible.

During the first six months of operation, the liquid releases amounted to $4.5 \times 10^{-6}\%$ of Technical Specifications limits. With continued plant operation, we expect an increase in the amounts of

radioactivity to be released. However, based on the history of the operation of this plant and other similar plants, we conclude that the total activity to be released with liquid effluents during the period of the NEPA review will be acceptably small.

3.1.3 Solid Radwaste

The solid radwaste system relies on shipments of solids from the plant to AEC licensed off-site disposal facilities. For the first six months of operation, Monticello has shipped 7.6 curies of solid waste to Sheffield Nuclear Center, Sheffield, Illinois. The amount of solid wastes that will be generated and will require shipment during the NEPA review period are not expected to be significant.

3.1.4 Transportation of Irradiated Fuel Elements

NSP states that shipment of irradiated fuel from the Monticello plant during the NEPA review period is not expected.^{6/}

3.1.5 Conclusions

Based on plant operating data and data from the environmental monitoring programs, we conclude that radioactive releases from Monticello are not causing any significant adverse impact on the

^{6/} Monticello show cause statement filed October 15, 1971, page 10.

environment. In-plant monitoring and continuation of the environmental monitoring programs by NSP and the State of Minnesota will assure detection of incipient adverse environmental effects from continued operation of the plant. Even if reduction in these low levels is deemed desirable as the result of the NEPA review, the added increment of radiation during the NEPA review period will be within the technical specification limits which are designed to prevent undue impact on safety or the environment and therefore are acceptable.

3.2 Water Use

3.2.1 Cooling Water Requirements

Cooling water for the plant comes from the Mississippi River. On March 12, 1970, the MDNR issued a permit authorizing NSP to appropriate water from the Mississippi River for use in the operation of the Monticello plant.^{7/} The authorization is for continuously pumping water from the Mississippi River at a variable rate from 45 cfs to 645 cfs for a maximum total annual appropriation of about 467,000 acre feet. The permissible flow depends on river flow, temperature and climatic conditions, and allows several modes of operation of the recirculating water system. The recirculating water system includes two induced draft, cross flow cooling towers.

^{7/} Exhibit 4, Monticello show cause statement filed October 15, 1971.

Each cooling tower is rated to remove 3.9×10^9 Btu/hr at a flow of 645 cfs and a wet bulb temperature of 73°F.

The cooling towers are not designed for operation during the winter months. We understand the MPCA has requested NSP to operate the cooling towers throughout the year, NSP is currently evaluating this request. If, after the completion of the NEPA environmental review, year round operation of the cooling towers should be required, the present system can be modified to meet this requirement. In the interim period, continued operation of the plant will be within the limits prescribed in the water use permit issued by MDNR.

The nearest public water supply using Mississippi River water is the Minneapolis-St. Paul system, approximately 35 miles downstream from the plant. As discussed in Section 3.1.2, the liquid radwaste discharges to the Mississippi River have been small. Measurements by the Minnesota Department of Health and the St. Paul Water Department show no increase in radioactivity in the St. Paul water supply since the Monticello plant began operation. Since water releases to the river are controlled on a batch basis, it is not expected that the radioactivity level of discharges to the river will increase significantly during the NEPA review period.

The Monticello plant also uses well water for plant domestic needs and river intake pump shaft sealing. Two wells, each rated at 50 gpm withdraw ground water from a depth of approximately 90 feet. MDNR has issued a permit to NSP allowing ground water appropriation at the rate of 100 gpm. We are in agreement with the opinion that continuation of this withdrawal during the NEPA review will not have noticeable effects on surrounding wells outside the site.

3.2.2 Thermal Effects

On May 20, 1969, the MPCA issued a waste disposal permit for the Monticello Plant, which includes thermal discharges to the river.^{8/} This permit requires that the maximum temperature of the discharged water not exceed limits specified for each month of the year or 5°F above the ambient temperature of the river, whichever is greater, except that in no case shall the river temperature be raised above 90°F by the discharge of the effluent, after reasonable dilution and mixing in the river.

According to the licensee, thermal surveys of the discharges to the river are being conducted with the cooperation of the MPCA.^{9/}

^{8/} See Note 1, page 3.

^{9/} Monticello show cause statement filed October 15, 1971, page 6.

These surveys will continue until appropriate data are collected under various climatic and hydrologic operating conditions to establish the mixing zones provided for in the MPCA permit. The licensee reports that under summer conditions, when the full flow is directed to the cooling towers before the water is discharged to the river, that within about 100 ft. downstream from the plant, the plume temperature is less than 5°F above ambient.^{9/} These same studies show that by the time the flow reaches the community of Monticello, three miles downstream, the plume temperature profile average reaches a level within 2°F of ambient. In this three-mile reach, the heated water travels close to the right bank of the river, so that more than half of the stream profile is essentially unaffected by the warm water discharge.

We conclude that any adverse effects that may arise due to thermal discharges over the period of the NEPA review period will probably be small. An environmental monitoring program is discussed in Section 3.2.3 which should permit detection of adverse trends and indicate the need for any remedial action.

3.2.3 Ecology

An environmental monitoring program has been in effect since May 1968 and will continue for the duration of the life of the

^{9/} Monticello show cause statement filed October 15, 1971, page 6.

plant.^{10/} The collection and sampling frequencies of the environmental monitoring program are incorporated in the plant Technical Specifications. The licensee issues yearly reports of the data collected in the program. Three reports have been filed with the AEC, the latest one for the year 1970.^{11/} Since the plant did not start operation until 1971, these reports can be considered to provide a base line for subsequent studies. Interim reports also have been submitted by NSP consultants. Dr. Alan J. Brook, Consulting Biologist, Department of Ecology and Behavioral Biology, University of Minnesota, compared analyses of algae samples obtained from the Mississippi River at Monticello from January through August 1971, with samples obtained in 1970, prior to plant operation.^{12/} Dr. Alfred J. Hopwood, Department of Biology, St. Cloud State College made an assessment of the impact of the Monticello plant on aquatic ecology in the first six months of operation.^{13/} The reported data show that there has been some effect on algae and aquatic life since start of operation, but because of the short period of plant operation, it is difficult to reach conclusions regarding whether the observations are related to the thermal

^{10/} Exhibit 6, Monticello show cause statement dated October 15, 1971.

^{11/} Environmental Monitoring and Ecological Studies Program, 1970 Annual Report, July 1, 1971

^{12/} Exhibit 8, Monticello show cause statement dated October 15, 1971.

^{13/} Exhibit 7, Monticello show cause statement dated October 15, 1971.

impact of discharges or possibly attributable to other factors. We conclude that during the relatively short NEPA review period, continued operation of the plant within the limits for thermal discharges set by the MPCA will not cause significant adverse effects on the environment. Any incipient effects would be detected by the existing monitoring program and corrective action taken.

3.3 Climatology

Monticello has two 9-cell, induced draft, cross flow cooling towers as part of the circulating water system. The two adverse meteorological effects resulting from the operation of a wet cooling tower are fog and drift.

A visible plume frequently is discharged from a wet cooling tower. This plume consists of localized fog. Fog can exist when the air is saturated with water vapor and occurs under conditions of high humidity and low temperature. The concern with regard to the operation of a wet cooling tower is that under unusual climatic conditions, the plume could touch the ground. This could occur under conditions of high humidity, low temperature and high atmospheric stability. When temperatures are low enough, this fogging could contribute to local icing conditions. Usually, however, cooling tower plumes rise due to their initial velocity and buoyancy. Since

the cooling towers are not expected to be used during the winter months of this year, fogging from the cooling towers is not considered to create a significant problem during the cold weather months at the beginning of the NEPA review period.

Drift is the entrained water droplets that can be carried out of a wet cooling tower. Recent surveys of cooling towers and experience at Monticello have indicated only minor instances of this effect. Drift from the cooling towers is not expected to create any significant problems during the NEPA review. Any problems due to drift can be reduced by installing suitable drift eliminators on the towers.

We conclude that the continued operation of the plant and the required use of the cooling towers will not have a significant effect on the climatology of the area during the NEPA review period. The incremental addition of moisture to the watershed is very small when considered in terms of additional rainfall. However, a significant additional dollar cost would be incurred if a different cooling method were required as a result of the NEPA review.

3.4 Land Use

The site is located about three miles northwest of the Village of Monticello, Minnesota, on the Mississippi River. Since the

plant is in operation, changes to the land have already taken place. The licensee states that except for recent small parcel acquisitions, NSP has owned the 1325-acre site since 1925, and that no additional land use is contemplated during the NEPA review period.^{14/} The applicant also states that areas used during construction for laying down equipment, parking, construction force offices and shop buildings have been graded and are being allowed to return to their original state.

All transmission facilities from the plant were completed by July 1970. The licensee states that no additional facilities are planned for installation during the review period.^{15/}

We conclude that suspension of operations during the NEPA review period would not affect the use of land.

3.5 Aesthetics

The Monticello plant was built as a commercial facility. No special treatment was provided, except as the applicant states, "The facilities were given special architectural treatment in an

^{14/} Monticello show cause statement filed October 15, 1971, page 3.

^{15/} Monticello show cause statement filed October 15, 1971, page 4.

attempt to blend them into the surroundings."^{15/} We conclude that suspension of operation would not affect the appearance of the plant with the exception of fogging as noted above.

3.6 Noise

Nuclear reactors do not produce undue noise levels during operation. The nearest residence to the Monticello plant is 2750 feet and the nearest roadway (State Highway 152) is approximately 3000 feet from the reactor building. The licensee states that to date no complaints have been received regarding noise. Since no major modifications to the plant are anticipated during the NEPA review period, the level of noise is not expected to rise during this period.^{16/}

Based on the low noise level produced in a nuclear power plant and the distances from the plant to the nearest residence or roadway, we conclude that the noise level at the Monticello plant is acceptable and that suspension of operation during the period of NEPA review would not provide a significant benefit.

3.7 Non-Radiological Effluents

3.7.1 Chemical Releases

Some discharge of water from the cooling towers is necessary to prevent fouling, because of the accumulation of solids during the

^{15/} Monticello show cause statement filed October 15, 1971, page 4.

^{16/} Ibid, page 12.

evaporation process. Chemicals that are used to control fouling of the cooling towers are discharged, but in relatively small quantities. The MPCA waste disposal permit for the Monticello plant specifies limits on types and content of chemicals that are allowed in non-radiological releases to the Mississippi River. We concur with the MPCA limits and have concluded that the impact on the river of releases of within these limits will not be appreciable. At Monticello, chemical wastes are collected in a holdup pond for settlement or treatment, if required, prior to release to the Mississippi River. To date, these releases have been well within the prescribed limits.^{17/} There is no reason to believe that the prescribed limits will be exceeded during the NEPA review period. Alternative chemical agents or further treatment of the discharge would not be precluded by continued operation of the plant.

3.7.2 Sanitary Sewage

According to the licensee, sanitary sewage from the plant is collected and treated in a system utilizing a 7000-gallon septic tank and a drain field approved by the Minnesota Department of Health.^{18/} The MPCA waste disposal permit for Monticello states

^{17/} Monticello show cause statement filed October 15, 1971, page 7.

^{18/} Ibid, page 11.

that "No raw sewage or treated sewage effluent shall be discharged to surface waters of the state from the plant site.^{19/} We conclude that the sanitary sewage generated at Monticello will not have an impact on the environment.

3.7.3 Miscellaneous Releases

Normal operation of the Monticello plant will generate small amounts of combustion products. Sources of these combustion products are from the plant heating boiler which utilizes light fuel oil; monthly testing of the emergency diesel generators; and periodic testing of the diesel-engine-driven emergency and fire pumps. The amount of air pollutants generated from these sources is relatively small. The adverse impact on the environment from air pollutants generated from the operation of combustion equipment at the Monticello plant during the period of the NEPA review would be insignificant.

3.8 Miscellaneous Environmental Effects

3.8.1 Population

The plant has an operating staff of approximately 70 people who live in neighboring communities. We are of the opinion that the number of people scattered in these communities are not a

^{19/} Exhibit 5, Monticello show cause statement filed October 15, 1971, page 2.

significant burden on the community facilities such as housing and schools. NSP states that no increase in the size of the Monticello staff is contemplated during the NEPA review period.^{20/}

3.8.2 Intake Structure and Fish

To reduce the possibility of fish being taken up by the intake flow, the plant river water intake facilities have been designed for a flow of about 0.5 fps, whereas the average river velocity is 4 to 5 fps. In the intake structure, the water passes through a trash rack followed by two parallel automatically operated traveling screens. According to the licensee, prior to commercial operation of the plant, certain changes were made to the intake system to reduce the potential for fish damage.^{21/} Also, as a result of an understanding between NSP, the MDNR, and the MPCA, wash water from the intake structure traveling screens is now returned directly to the river, so that the few fish that might be carried by the traveling screens are returned to the river.^{21/} We conclude that appropriate precautions to mitigate harm to fish have been taken and considering the period of the NEPA review, these precautions are adequate.

^{20/} Monticello show cause statement filed October 15, 1971, page 12.

^{21/} Ibid, page 7.

3.8.3 Future Tests by EPA

The applicant states that in February 1970, NSP entered into an agreement with the Federal Water Pollution Control Administration (now part of the Environmental Protection Agency) to allow use of a small portion of the Monticello site for the purpose of conducting field temperature studies on fish and biological organisms.^{22/} Using warm water discharges from the Monticello plant, controlled water temperature environments for the studies will be provided in a series of small canals. Construction work by the federal agency will soon be underway on these facilities and operation is expected to begin in 1972. We concur with the licensee that this facility will not interfere with the environmental protection features of the plant and will provide valuable scientific information.

3.9 Foreclosure of Alternatives During the Prospective Review Period

As discussed above, the incremental environmental impact of continued operation of the plant during the full NEPA review would not be significant. The major adverse environmental impact has already been made. Alternatives that potentially could be affected by continued operation are those related to effluent control measures. These include the environmental impact of routine or

^{22/} Ibid, page 4.

accidental radiological releases, thermal and chemical effects of water releases and the environmental impact of water vapor from the cooling towers. We have examined each of these areas to determine the alternatives that might be foreclosed as a result of continued operation during the NEPA review period and concluded that further operation will not foreclose alternatives in this completed operating plant.

Appendix D to 10 CFR Part 50 requires that a cost-benefit analysis of radiological, thermal and other environmental effects be performed by the AEC during the NEPA review and that a conclusion be reached on whether modification or termination of the license is warranted. The radiological effects involve both anticipated low-level releases associated with operation of the plant and with potential releases of radioactivity at somewhat higher levels that could result from an accident.

Routine gaseous and liquid effluent releases are governed by the limits set forth in 10 CFR Part 20 and the technical specifications which are included in the operating license. NSP is further required to keep radioactive effluents as far below these limits as practicable. This will include meeting numerical guidelines for routine releases comparable to those proposed in Appendix I to 10 CFR Part 50. We conclude that modifications to the radwaste system would not be precluded by continued operation.

The probability of occurrence of accidents and the spectrum of their consequences to be considered from an environmental effects standpoint will be analyzed using best estimates of probabilities and realistic fission product release and transport assumptions. For site evaluation in our safety review extremely conservative assumptions were used for the purpose of comparing calculated doses resulting from a hypothetical release of fission products from the fuel, against the 10 CFR Part 100 siting guidelines. The computed doses that would be received by the population and environment from actual accidents would be significantly less than those presented in our Monticello Safety Evaluation.^{23/} Although the environmental effects of radiological accidents are anticipated to be small, if further reduction of postulated accidental releases is required as a result of the full NEPA review, additional engineered safety systems could be added. For example, space is available for the inclusion of supplemental containment air cleanup systems.

Operating parameters also could be adjusted, at some extra dollar cost, to reduce further the environmental impact of postulated accidental releases. We conclude that alternatives related to mitigation of accident consequences would not be precluded by the continuation of operation during the prospective NEPA review period.

^{23/} Safety Evaluation by the Division of Reactor Licensing, U.S. Atomic Energy Commission in the matter of Northern States Power Company, Monticello Nuclear Generating Plant, Unit 1, Docket 50-263, March 18, 1970, page 44.

Thermal effects on the Mississippi River ecology will be small because of the use of cooling towers. Small quantities of chemicals from the cooling towers will be discharged. Some environmental effects will result from the water vapor released from the top of these cooling towers. A significant additional dollar cost would be incurred if a different cooling method were required as a result of the NEPA review.

In summary, no alternatives would be foreclosed by continued operation of the plant from the standpoint of technical feasibility, but significant dollar costs could be incurred if major changes in the plant design, such as a change in the method of cooling, were required at the end of the NEPA review.

4.0 ALTERNATIVES IF SUSPENSION ACTION WERE TAKEN

4.1 Power

NSP and its subsidiary, Northern States Power Company (Wisconsin), own and operate an interconnected system of electric transmission lines in Minnesota, Wisconsin, North Dakota and South Dakota. Electric power is produced in various generating stations or received through interconnections with other power suppliers. The present NSP generating capacity, including Monticello is 3436 MW, and an additional 313 MW of generating capacity from fossil plants is expected to be available in May 1972.^{24/} The peak load

^{24/} Monticello show cause statement filed October 15, 1971, page 2.

registered to date is 3301 MW, which occurred in 1971.^{24/} The projected peak load for the summer of 1972 is 3678 MW.^{25/} Monticello summer rating is 533 MW. - The projected generating capacity of NSP equals the projected peak load, without any reserve. With no reserve, if the Monticello plant were to be made unavailable, at times of peak loads, power would have to be provided from other power generating companies or customers' power consumption would have to be curtailed. In the meantime, older, less efficient, fossil fuel burning plants would have to operate to make up the needed power.

If the Monticello plant is not available, the Upper Mississippi Valley Power Pool, of which NSP is a member, will have a reduction in the generating reserve from 12% to 4%.^{26/} Since the contiguous areas also have new nuclear operating reactors subject to NEPA review (Point Beach and Dresden 3), the shortage of power in this section of the country could become acute, particularly if operation of these plants were suspended during the NEPA review period.

The unavailability of power would require NSP to attempt to replace some of the Monticello generated energy from its older, less efficient equipment. According to NSP, to replace the energy

^{24/} Monticello show cause statement filed October 15, 1971, page 2.

^{25/} Ibid, Appendix 9, page 2.

^{26/} Monticello show cause statement filed October 15, 1971, page 15.

generated at Monticello would require 1.8 million tons of coal per year, which has not been purchased.^{27/} It is doubtful whether the additional supply and transportation facilities required to provide this amount of coal or oil could be made available in time. Also, the burning of this additional coal in NSP's older generating equipment would release approximately 80,000 tons of sulphur dioxide and 18,000 tons of particulate matter, which would have a substantial impact on the environment.^{27/}

According to the licensee, in 1972 new air pollution control equipment is scheduled to be installed in several plants to meet new air quality requirements.^{27/} Conceivably, the deferral of shutdown of these plants for installation of antipollution equipment could be required if power were not available from the Monticello unit.

4.2 Costs

We have examined the NSP estimate of costs that might be incurred through suspension of the Monticello operating license in whole or in part.^{28/} If the license were to be suspended in its entirety pending completion of the NEPA review, NSP has stated

^{27/} Monticello show cause statement filed October 15, 1971, page 16.

^{28/} Ibid, page 17.

under oath that the added expenses would amount to about \$20,000,000 for the one-year period.^{29/} This estimate and the other costs estimates discussed herein do not appear to be unreasonable. These costs are based on the assumption that all energy requirements would be furnished by NSP generation to the extent possible, and beyond this, purchases from outside sources are assumed. In addition, there will be an added cost due to contractual commitments for nuclear fuel and reprocessing. This penalty is estimated by the licensee to be \$1,000,000 over the one year period.^{29/}

5.0 DETERMINATION AND BALANCING OF FACTORS

Pursuant to Section E of Appendix D to 10 CFR Part 50, we have taken into consideration and balanced the following factors in making a determination whether to suspend the operating license for the Monticello plant pending completion of the NEPA environmental review.

5.1 It is not likely that continued operation during the period that the NEPA review will be completed will give rise to an incremental impact on the environment that is substantial and unduly adverse. As discussed in Section 3.0 above, the

^{29/} Monticello show cause statement filed October 15, 1971, page 17.

environmental effects are those associated with the operation of the plant. The environmental costs of construction, i.e., those associated with the change of the site from its former undeveloped state, already have been incurred.

5.2 Continued operation during the prospective NEPA review period would not foreclose subsequent adoption of alternatives to plant design features from the standpoint of technical feasibility if modifications were required at the end of the NEPA review. As discussed in Section 3.1 and 3.9 above, existing flexibility exists in system performance specifications in the area of treatment of radioactive wastes and installation of additional accident mitigating features should improvements in these areas prove necessary as a result of the NEPA review. As discussed in Section 3.2 and 3.7 above, additional reduction in temperature of the heated water from the cooling towers would not be precluded, nor would a different type of chemical additive or additional treatment of these additives be precluded. A change in the type of cooling facility would be more costly, but would be technically feasible. We regard this eventuality as unlikely in view of the absence of apparent substantial environmental impact and we are supported in this judgement by the favorable comments from other Federal and State agencies on the expected impacts of operation which are consistent with experience to date.

As discussed in Section 3.1 above, continued operation of the plant will result in some gaseous, liquid and solid radioactive waste generation. However, the added increment of radiation during the NEPA review period would be very small.

5.3

The effects of suspension of the operating license would be substantial. As discussed in Section 4.2 above, the cost of shutting down the plant for one year has been estimated at about \$21,000,000. As discussed in Section 4.1 above, there would be increased environmental impact due to operation of old, coal burning plants.

Continued operation of the plant will increase the level of activity in some equipment. However, as discussed in Section 3.1.1 above, NSP has proposed to modify the gaseous radwaste system which will effect a substantial reduction in the stack activity release rate. We conclude that the large cost of plant shutdown (\$21,000,000) outweighs the possibility that the slight increase in radioactivity levels of some equipment during the period of continued operation would affect substantially a subsequent decision regarding modification of the facility to reduce environmental impact.

After balancing the factors described above as to environmental impact of continued operation and the potential for foreclosure

of alternatives as a result of further operation of the plant against the effects of shutdown costs, we conclude that the operating license for the Monticello Nuclear Generating Plant should not be suspended pending completion of the NEPA review.

Pending completion of the full NEPA review, the holders of Provisional Operating License No. DPR-22 may proceed with the operation of the plant. The discussion and findings herein do not preclude the AEC as a result of its ongoing NEPA environmental review from continuing, modifying, or terminating the operating license or its appropriate conditioning to protect environmental values.