UNITED STATES ATOMIC ENERGY COMMISSION

NORTHERN STATES POWER COMPANY

Monticello Nuclear Generating Plant Docket No. 50-263

REQUEST FOR AUTHORIZATION OF
A CHANGE IN TECHNICAL SPECIFICATIONS
OF APPENDIX A

PROVISIONAL OPERATING LICENSE NO. DPR-22

(Change Request Dated October 31, 1973)

Northern States Power Company, a Minnesota corporation, requests authorization for changes to the Technical Specifications as shown on the attachments labeled Exhibit A and Exhibit B. Exhibit A describes the proposed changes along with reasons for change. Exhibit B is a set of Technical Specification pages incorporating the proposed changes.

This request contains no restricted or other defense information.

NORTHERN STATES POWER COMPANY

By _____
Wade Larkin
Group Vice President - Power Supply

On this 31 day of October, 1973, before me a notary public in and for said County, personally appeared Wade Larkin, Group Vice President - Power Supply, and being first duly sworn acknowledged that he is authorized to execute this document in behalf of Northern States Power Company, that he knows the contents thereof and that to the best of his knowledge, information and belief, the statements made in it are true and that it is not interposed for delay.

_____
John J Smith
Notary Public, Hennepin County, Minnesota

JOHN J. SMITH
Notary Public, Hennepin County, Minnesota
My Commission Expires March 2, 1976

EXHIBIT A

MONTICELLO NUCLEAR GENERATING PLANT
DOCKET NO. 50-263

CHANGE REQUEST DATED October 31, 1973

PROPOSED CHANGES TO THE TECHNICAL SPECIFICATIONS
APPENDIX A OF PROVISIONAL OPERATING
LICENSE NO. DPR-22

Pursuant to 10CFR50.59, the holders of the above-mentioned license hereby propose the following changes to Appendix A, Technical Specifications, to be placed in effect during and at the conclusion of operational testing of the Modified Off-gas System:

1. Technical Specification Revisions Contained in Change No. 2 to Provisional Operating License DPR-22 (Attachment A to letter from R S Boyd, Asst Director for BWR's, Division of Reactor Licensing, USAEC, dated January 14, 1972)

PROPOSED CHANGE

Delete all of the revisions contained in Change No. 2.

REASON FOR CHANGE

Change No. 2 was intended to be placed into effect following completion of the augmented off-gas system. We believe the revisions contained in Change No. 2 are inadequate for the following reasons:

a. The trip point for the air ejector radiation monitors was inadvertently deleted.

b. No trip point for the stack radiation monitors was given.

c. There is no provision for plant operation with one air ejector radiation monitor out of service.

d. No provision was made for plant operation in the event that both off-gas recombiner trains or storage compressors are inoperable.

e. No changes to the existing Bases for Specifications 3.2, 4.2, and 3.8/4.8 were made by Change No. 2. Without additional revisions these Bases will contain numerous errors.

f. Definitions of Q1 and QRS were deleted from Specification 3.8.A.

g. Specifications citing the deleted annual average release rate were not corrected.

h. No surveillance requirements were specified for calibration and monitoring of the off-gas storage tank radiation monitors.

i. No maximum gross radioactivity specification was set for the off-gas storage tanks.

2. Specification 3.2.D, Air Ejector Off-Gas System

PROPOSED CHANGE

Change Specification 3.2.D to read:

D. Air Ejector Off-gas System

1. Except as specified in 3.2.D.2 and 3.2.D.3, both steam jet air ejector off-gas radiation monitors shall be operable during reactor power operation. The trip settings for the air ejector monitors, except as specified in 3.2.D.4, shall be set to close within 30 minutes the recombiner train inlet valve (s) at a level not to exceed the equivalent of 270,000 microcuries per second after a decay time of 30 minutes.

2. From and after the date that one of the two steam jet air ejector off-gas radiation monitors is made or found to be inoperable, continued reactor power operation is permissible provided the inoperable radiation monitor instrument channel is tripped.

3. Upon loss of both steam jet air ejector off-gas radiation monitors, an orderly shutdown shall be initiated and the reactor shall be in cold shutdown within 24 hours.

4. If operation is necessary with the Off-gas Holdup System recombiners bypassed, the steam jet air ejector radiation monitors shall be set to close the off-gas isolation valve instead of the recombiner inlet valves with a delay time not to exceed 15 minutes.

REASON FOR CHANGE

The steam jet air ejector radiation monitor trip setting is currently based on the 15-minute average release limit of 2.7 Ci/sec. The 15-minute average release limit is to be deleted and a new basis for the monitor trip setting is required. Establishing the trip setting at a value equivalent to the new maximum release rate of 270,000 uCi/sec at the stack will assure off-gas isolation prior to releases in excess of this limit.

With the recombiners in operation, the holdup time in the off-gas delay pipe is at least two hours. The proposed 30 minute delay in closure of the recombiner inlet valves to permit plant action to reduce effluent levels is therefore conservative. With the Off-gas Holdup System recombiners bypassed, the holdup time in the off-gas delay pipe is at least 30 minutes. The proposed 15 minute delay in closure of the off-gas isolation valve to permit plant action to reduce effluent levels is therefore conservative.

3. Specification 3.2.E.2, Reactor Building Ventilation Plenum Radiation Monitors

PROPOSED CHANGE

Change Specification 3.2.E.2 to read:

2. The radiation monitors shall be set to trip as follows:

(a) Ventilation plenum ≤ 3mR/hr
(b) Refueling floor ≤ 100mR/hr

REASON FOR CHANGE

The new maximum release limit for the Reactor Building Vent is 21,000 uCi/sec of gross radioactivity. A trip setting of 3mR/hr has been established by AEC Staff calculations as being equivalent to this release limit.

4. Table 4.2.1

PROPOSED CHANGE

Change the Off Gas Isolation portion of the table to read as follows:

Instrument Channel	Test (3)	Calibration (3)	Sensor Check (3)
Off Gas Isolation			
Radiation Monitors (Air Ejectors)	Notes (1,5)	Note 6	Once/shift

REASON FOR CHANGE

This change will clarify the method of calibration to be used on the steam jet air ejector radiation monitors. Note 6 requires a calibration each quarter using the built-in current source and a calibration each refueling outage using a known radioactive source.

5. 3.2 Bases

PROPOSED CHANGE

Change the second paragraph on page 68 to read:

Two air ejector off-gas monitors are provided and when their trip point is reached, cause an isolation of the air ejector

off-gas line. Isolation is initiated when both instruments reach their high trip point or one has an upscale trip and the other a downscale trip or two downscale. There is a 30-minute delay before recombiner train inlet valve closure when the recombiners are in use and a 15-minute delay before off-gas isolation valve closure when the recombiners are bypassed in which the reactor operator may take corrective action. Both instruments are required for trip. The trip settings of the instruments are set so that the maximum stack release rate limit allowed by Specification 3.8.A.1 is not exceeded.

Change the fourth sentence in the third paragraph on page 68 to read:

Trip settings of 3 mR/hr for the monitors in the ventilation duct are based upon initiating normal ventilation isolation and Standby Gas Treatment System operation so as not to exceed the maximum release rate limit allowed by Specification 3.8.A.1 for the reactor building vent of 21,000 microcuries per second of gross radioactivity.

REASON FOR CHANGE

The proposed change corrects the Bases to reflect the installation of the Off-gas Holdup System and the reduced Reactor Building Ventilation Plenum Radiation Monitor trip setting.

6. Specification 3.8.A, Airborne Effluents

PROPOSED CHANGE

Change Specification 3.8.A to read:

A. Airborne Effluents

A set of equations are given to express the airborne effluent limits. The symbols stand for the following:

Q1 = release rate from off-gas stack

QRS = release rate from reactor building vent

1. The maximum release rates of gross radioactivity computed on a 15-minute average basis shall not exceed a rate Q, in curies/sec:

$$\frac{Q1}{0.27} + \frac{QRS}{0.021} \leq 1$$

2. The release rates of gross radioactivity shall not exceed 16 percent of the limit in Specification 3.8.A.1 averaged over any calendar quarter.

3. The maximum release rate of radioiodine-131 (I-131) shall not exceed a rate Q, in microcuries/sec:

$$\frac{Q1}{25} + \frac{QRS}{1.2} \leq 1$$

4. The release rate of I-131 shall not exceed 4 percent of the limit in Specification 3.8.A.3 averaged over any calender quarter.

5. The maximum release rates of radioactive particulates with half-lives greater than 8 days shall not exceed a rate Q, in microcuries/sec:

$$\frac{Q1}{9.5X10^{7}\ \overline{MPCa}} + \frac{QRS}{1.1X10^{5}\ \overline{MPCa}} \leq 1$$

where $\overline{MPCa}$ is the composite maximum permissible concentration in air in $\mu Ci/ml$ determined using Appendix B, Table II, Column 1 and Notes of 10 CFR 20.

6. The release rates of radioactive particulates with half-lives greater than 8 days shall not exceed 8 percent of the limit in Specification 3.8.A.5 averaged over any calendar quarter.

7. If the maximum release rate limits of Specifications 3.8.A.1, 3.8.A.3, or 3.8.A.5 are not met following a routine surveillance check, an orderly shutdown shall be initiated and the reactor shall be in the cold shutdown condition within 24 hours.

8. If the limits of Specifications 3.8.A.2, 3.8.A.4 or 3.8.A.6 are exceeded, appropriate corrective action such as an orderly reduction of power shall be initiated to bring the releases within these limits.

9. If the release rates exceeds four percent of the limits in Specification 3.8.A.1 averaged over any calendar quarter or two percent of the limits in Specifications 3.8.A.3 or 3.8.A.5 averaged over any calendar quarter, the following actions shall be taken:

a. Investigate to identify the causes for such release rates.

b. Define and initiate a program to reduce such release rates to the design levels.

c. Provide a report describing these actions within 30 days as an unusual event (See Specification 6.7.B.2).

10. At least one of the two stack monitors, including the charcoal cartridge and particulate filter, shall be operable at all times that the stack is releasing effluents to the environs.

11. If both stack monitors are made or found inoperable, the reactor shall be placed in the hot standby condition within 24 hours.

12. Except as specified in 3.8.A.13, the off-gas stack and reactor building vent monitors shall have automatic isolation setpoints consistent with Specification 3.8.A.1 and alarm setpoints consistent with Specification 3.8.A.2.

13. If operation is necessary with the Off-Gas Holdup System recombiners bypassed, the off-gas stack monitors shall serve only an alarm function.

REASON FOR CHANGE

Specifications 3.8.A.1 through 3.8.A.9 are required to bring the Monticello gaseous release limits into agreement with current AEC "as low as practicable" guidelines.

Specifications 3.8.A.10 through 3.8.A.13 establish limiting conditions for operation for the off-gas stack radiation monitors and specify alarm and trip setpoints for the gaseous effluent monitoring systems.

7. Specification 4.8.A, Airborne Effluents

PROPOSED CHANGE

Change Specifications 4.8.A to read:

A. Airborne Effluents

1. Station records of gross stack release rate of gaseous activity shall be maintained on an hourly basis to assure that the specified rates are not being exceeded, and to yield information concerning general integrity of the fuel cladding. Records of isotopic analysis shall be maintained. The off-gas stack and reactor building vent monitoring system shall be functionally tested monthly and calibrated quarterly with an appropriate standard radiation source. Each monitor, as described, shall have a sensor check at least daily.

2. An air ejector off-gas sample isotopic analysis for at least six fission product gases; Xe-138, Xe-135, Xe-133, Kr-88, Kr-85m, Kr-87 shall be made at least weekly and following each refueling or other occurrence which could alter significantly the mixture of radionuclides.

3. Gaseous release of tritium shall be calculated on a quarterly basis from the tritium concentration of the condensate. Vaporous tritium shall be calculated from a representative sample. The sum of these two values shall be reported as the total tritium release.

4. Station records of release of radioiodines and particulates with half-lives greater than 8 days shall be maintained on the basis of all stack and vent cartridges counted. The charcoal cartridges shall be counted weekly when the measured release rate of radioiodine-131 activity is less than the rate of Specification 3.8.A.4; otherwise the cartridges shall be counted daily. The particulate filters shall be counted weekly when the measured release rate of particulate radioactivity with half-lives greater than 8 days is less than the rate of Specification 3.8.A.6; otherwise the activity shall be counted daily. Monthly the principal particulate gamma radionuclides shall be determined.

REASON FOR CHANGE

The revisions to Specification 4.8.A are required to accompany the changes in Specification 3.8.A which incorporate "as low as practicable" guidelines. The changes in sampling frequencies and methods of analysis reflect current AEC guidance in these areas.

8. Specifications 3.8.E and 4.8.E, Augmented Off-gas System

PROPOSED CHANGE

Delete Specification 3.8.E and the first and third paragraphs of 4.8.E. Renumber Specification 4.8.E as 4.8.F and change the Specification title to "Enviromental Monitoring Program". Add new Specifications 3.8.E and 4.8.E as follows:

3.8.E. Augmented Off-Gas System

1. If the hydrogen concentration in the off-gas downstream of the recombiners reaches four percent, the recombiner off-gas flow shall be stopped automatically by closing the valves upstream of the recombiners.

2. Except as specified in Specification 3.8.E.3 below, at least one hydrogen monitor upstream and one hydrogen monitor downstream of each operating recombiner shall be operable during power operation.

3. If the above specified upstream hydrogen monitors are not operable, continued operation of a recombiner is permissible if the Hydrogen Inventory Processor is set to provide a constant signal representative of the worst case hydrogen concentration. If the above specified downstream hydrogen monitors are not operable, an orderly reactor shutdown shall be initiated to transfer the Off-gas System to the recombiner bypass mode.

4. The maximum gross radioactivity contained in one gas decay tank after 12 hours holdup that can be discharged directly to the environs shall be less than 22,000 curies of Xe-133 dose equivalent. If these conditions cannot be met, the stored radioactive gas shall be recycled within 24 hours to other gas tanks until the condition is met.

4.8.E Augumented Off-Gas System

1. The hydrogen monitors shall be functionally tested monthly and calibrated quarterly with an appropriate gas mixture source. Each monitor shall have a sensor check at least daily.

2. Tank radiation monitors shall be calibrated quarterly by correlation with tank sample analyses. Monitor readings shall be recorded every eight hours to determine that the limit of Specification 3.8.E.4 is not exceeded.

3. If a tank radiation monitor is inoperable, a sample from the gas decay tank shall be taken, analyzed, and recorded every 24 hours. If no additions to a tank have occurred since the last sample, the tank need not be sampled until the next addition.

REASON FOR CHANGE

The proposed trip point of the hydrogen monitors is four percent hydrogen by volume. This is the lower limit of flammability of hydrogen and will protect components of the off-gas system from possible explosion damage. In the event that the required upstream monitors are not available, the Hydrogen Inventory Processor is set to the worse case hydrogen concentration in the influent stream and will limit off gas flow accordingly. If the required downstream monitors are not available, operation of the recombiners is not permitted.

Calculations by the Commission staff have determined that limiting the contents of a single gas decay tank which could be released to the environs to 22,000 Ci of Xe-133 dose equivalent would limit the whole body dose to less than 20 mR at the plant boundary in the event of accidental tank discharge.

The minimum holdup time of 12 hours is controlled by electrical interlocks in the decay tank selection logic. The 12-hour decay will guarantee at least a 90% reduction in tank activity prior to release.

Off-gas flow rates during plant startup will normally exceed the capacity of the holdup system compressors. During these periods the off-gas is generally of low activity and can be exhausted directly through the off-gas stack.

Specifications 4.8.E.1 through 4.8.E.3 establish minimum calibration and monitoring requirements for the Off-gas Holdup System hydrogen monitors and storage tank radiation monitors.

9. 3.8/4.8.A Bases

PROPOSED CHANGE

Delete the fourth paragraph on page 177.
Change the second and third paragraphs to read as follows:

In order to limit gross radioactivity releases in gaseous effluents to as low as practicable, quarterly average release rates have been established which would require investigative actions at 4 percent of the maximum release rate and restricted operation action at 16 percent of the maximum release rate. These release rates are significantly below 10 CFR 20 limits and are factors of 2 and 8, respectively, above the design objectives.

Detailed thyroid dose calculations have been made by the AEC staff. The method is based on a 1500 mRem dose to a child that drank the milk from an existing milk cow continuously consuming the grass from the critical sector (northwest sector at 1.5 miles). The maximum annual diffusion parameter (X/Q) from the licensee's meteorological data for the stack release is 1.7×10^{-8} sec/m^3. Based on these calculations, a continuous release rate of I-131 in the amount of 25 μCi/sec from the off-gas stack would not result in offsite annual thyroid doses in excess of the limits specified in 10 CFR 20 of 1500 mRem.

Delete the first two paragraphs of 3.8/4.8.A Bases on page 178 and insert the following paragraphs on pages 178, 179, and new page 179A:

The AEC staff performed an analysis similar to that used to determine the maximum release rate for I-131 for radioactive particulates. A reduction factor of 700 on the $\overline{\text{MPCa}}$ to allow for possible ecological chain effects similar to those associated with radioiodine was used. The annual average diffusion parameter value of 1.5×10^{-7} sec/m^3 was used as determined for the most critical sector for an elevated release at 600 m in the SSE sector. Based on these calculations, a continous release rate of radioactive particulates with half-lives greater than 8 days in the amount of 9.5×10^{9} $\overline{\text{MPCa}}$ μCi/sec from the off-gas stack would not result in offsite manual organ doses in excess of the limits specified in 10 CFR 20. The resultant organ doses are not additive to those caused by the radioiodine or gross radioactivity releases.

The staff performed similar analysis for the reactor building vent release as for the off-gas stack releases except the releases were considered to be at or near ground level. The maximum annual average diffusion parameter (X/Q) from the licensee's meteorological data for the ground level release as used for radioactive particulates is 1.3×10^{-5} sec/m^3. The annual average diffusion parameter at the nearest existing milk cow as used for the radioiodine is 3.5×10^{-7} sec/m^3.

Based on these calculations, a continuous ground level release rate of I-131 in the amount of 1.2 uCi/sec would not result in offsite annual thyroid doses in excess of the limits specified in 10 CFR 20 of 1500 mRem. A continuous ground level release rate of radioactive particulates with half lives greater than 8 days in the amount of 1.1×10^8 $\frac{\mu Ci}{MPCa}$/sec would not result in offsite annual organ doses in excess of the limits specified in 10 CFR 20.

In order to limit radioiodine releases in gaseous releases to as low as practicable, quarterly average release rates have been established which would require investigative actions at 2 percent of the maximum release rate and restricted operation action at 4 percent of the maximum release rate. These release rates are significantly below 10 CFR 20 limits and are factors of 2 and 4, respectively, above the design objectives as defined in Regulatory Guide 1.42.

In order to limit radioactive particulate releases in gaseous effluents to as low as practicable, quarterly average release rates have been established which would require investigative actions at 2 percent of the maximum release rate and restricted operation action at 8 percent of the maximum release rate. These release rates are significantly below 10 CFR 20 limits and are factors of 2 and 8, respectively, above the design objectives.

Measurements of the gross radioactivity from the off-gas stack must be continuously monitored for possible changes in the release rates from the augmented off-gas system. Additional measurements are made continuously at the steam jet air ejector to evaluate the core condition and the quantity of radioactivity being added to the augmented off-gas system. The measurements obtained by sampling and isotopic analysis define the releases to the environs. Quarterly analysis for tritium is adequate to define such releases to the environs.

Isotopic analysis will be performed on samples taken from the steam jet air ejector. These samples will be used in an isotopic analysis for Xe-138, Xe-135, Xe-133, Kr-88, Kr-87, and Kr-85m, which is calculated to be approximatley 90 percent of the noble gas emission. The remaining noble gases will be calculated from empirical ratios with the measured gases. Such calculations will be made for the various gases down to a release rate of 100 uCi/sec. Argon 41 will not be measured routinely since it cannot be measured in the presence of the other noble gases.

The measurements and methods used for releases from the reactor building vent are similar to those described for released from the off-gas stack. It may be necessary to use off-gas stack data to evaluate the predicted low levels of release from the reactor building vent. Batch releases may be made during drywell purging or other special conditions when continuous monitoring is not available. For such conditions, sampling and analysis are required before releases are made and meteorological conditions may be used, if practical, to reduce possible environmental impact for such releases. If the samples indicate high concentrations of either radioiodines and/or radioactive particulates, the releases shall be filtered by the Standby Gas Treatment System.

Concentrations of gross radioactivity in the reactor building vent are expected to be below the minimum detectable levels with the existing analytical equipment. Therefore, isotopic analyses of samples from the vent will not normally be performed.

Measurement of the gross radioactivity from the duct to the vent is based upon an equivalent dose rate for the release rate in curies per second, i.e., analysis of a typical vent gas release resulted in a gamma dose rate of 3 mr/hr being equivalent to 21,000 microcuries/second release rate. Since an isotopic analysis cannot be made routinely of the vent effluent, the assumption is made that the isotopic composition in the vent will be the same as determined in the off-gas stack.

The release of radioiodine from the reactor is monitored by the use of charcoal cartridges which integrate the releases over the sampling period of one to seven days. Frequency of removal is dependent upon the release level measured on the previously removed charcoal cartridge. The relationship between coolant activity levels for radioiodine and effluent releases during possible iodine spiking conditions has not been determined. Measurements required for such possible operating conditions that may result in iodine spiking should provide necessary effluent data to the operator to evaluate plant conditions during such periods. The analysis performed for I-133 and I-135 indicates the contribution of these radioiodines to the possible inhalation doses.

The release of radioactive particulates with half lives greater than 8 days from the off-gas stack is monitored by the use of particulate filters which integrate the releases over the sampling period of one to seven days. All other aspects of particulate release measurements are similar to those discussed for radioiodine release measurements except for the relationship of iodine spiking to reactor operating conditions.

REASON FOR CHANGE

The proposed change corrects the Bases to reflect the adoption of the "as low as practicable" limits.

10. 3.8/4.8.E Bases, Augmented Off-gas System

PROPOSED CHANGE

Move Bases 3.8/4.8.B through 3.8/4.8.D to new pages 179A and 179B. Renumber Bases 3.8/4.8.E as 3.8/4.8.F and change the heading to read "Environmental Monitoring Program". Add new Bases 3.8/4.8E on new page 179C as follows:

E. Augmented Off-gas System

The hydrogen monitors are used to detect possible hydrogen buildups which could result in a possible hydrogen explosion. Isolation of the off-gas flow would prevent the hydrogen explosion and possible damage to the augmented off-gas system.

Experience has shown that a daily check with monthly testing and quarterly calibration assures proper operation of the hydrogen monitors and quarterly calibration assures proper operation of the radiation monitors.

The maximum gross radioactivity in one gas decay tank has been limited on the basis that accidental release of its contents to the environs by operator error after 12 hours decay should not result in exceeding the dose equivalent to the maximum quarterly release rate specified in Specification 3.8.A.2. Staff analysis of an elevated release under accident meteorology for a minimum release period of 8 hours indicated a release of 22,000 curies of Xe-133 or the dose equivalent would result in a whole body dose of 20 mRem at the nearest site boundary.

The frequency for monitoring or sampling has been established so that if the maximum amount of gross radioactivity is exceeded, action can be taken to reduce the radioactivity to a level below the specified limit.

REASON FOR CHANGE

The proposed change corrects the Bases to reflect the installation of the off-gas holdup system.

EXHIBIT B

Exhibit B, attached, consists of newly prepared pages of the Appendix A Technical Specifications as listed below which incorporate the proposed changes:

Pages 48
48A
49
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169
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170A
170B
173
173A
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179A
179B
179C