

UNITED STATES ATOMIC ENERGY COMMISSION

MAR 22 1971

NORTHERN STATES POWER COMPANY

Received

3-15-71

Monticello Nuclear Generating Plant

Docket No. 50-263

REQUEST FOR AUTHORIZATION FOR
CHANGE IN TECHNICAL SPECIFICATIONS
APPENDIX A OF PROVISIONAL OPERATING LICENSE NO. DPR-22

(Tech. Spec. Change Request No. 1)

Northern States Power Company, a Minnesota corporation, requests authorization for the addition of section 6.2.B.2 to Appendix A of Provisional Operating License DPR-22, Technical Specifications, as follows:

6.2.B.2 Respiratory Protection Equipment Requirements

- a. Allowances for the use of respiratory protection equipment in exposure of personnel in restricted areas to airborne concentrations of radioactive material may be applied on the basis of the following assumed protection factors and stated conditions.
- 1) MSA "Dustfoe" mask with type H "ultrafilter" (or equivalent). A protection factor of 10 for airborne particulates and 1 for gases applies upon assurance of good face fit and proper use.
 - 2) MSA full face mask with type H "ultrafilter" (or equivalent). A protection factor of 100 for airborne particulates and 1 for gases applies upon assurance of good face fit and proper use.
 - 3) MSA full face mask with type CBR combination chemical and particulate canister (or equivalent). This apparatus will be used in place of items 1) or 2) if concentrations of radioiodine exceed MPC values. A protection factor of 100 applies for airborne particulate and halogen radioactive materials upon assurance of good face fit and proper use.

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- 4) MSA supplied air respirator with full face mask, air line and variable flow demand regulator (or equivalent). A protection factor of 100 applies upon assurance of good face fit and proper use.
 - 5) MSA self-contained air breathing apparatus (or equivalent). Protection factors of 100 for operation in the demand regulated mode and 1000 for operation in the constant flow mode apply upon assurance of good face fit and proper use.
 - 6) MSA Chemox oxygen breathing apparatus (or equivalent). A protection factor of 1000 applies upon assurance of good face fit and proper use.
 - 7) MSA supplied air respirator with full face mask and positive pressure - constant flow regulator (or equivalent). A protection factor of 1000 applies upon assurance of good face fit and proper use.
- b. The protection factor is the reciprocal of the assumed penetration for the complete respirator. It is applied to the airborne concentration to determine the concentration which is assumed to be inhaled by the wearer, according to the following formula:
- $$\frac{\text{Airborne concentration}}{\text{Protection factor}} = \text{assumed concentration inhaled}$$
- c. Personnel exposure to airborne concentrations of radioactive materials in excess of the limit specified in Appendix B, Table 1, 10 CFR, Part 20 shall be permitted only in compliance with Monticello Nuclear Generating Plant administrative procedures and Radiation Safety authorizations and shall be performed under the supervision of the Radiation Protection Engineer.
- d. The requirements of 6.2.B.2 a, b, and c shall not preclude the use of respiratory protective equipment for precautionary or emergency purposes.

The justification for this request and the supporting information pursuant to 10 CFR, part 20.103 (c) (3) are detailed in the attachment to this request.

NORTHERN STATES POWER COMPANY

Dated March 15, 1971

By

Arthur V. Dienhart

Arthur V. Dienhart
Vice President - Engineering

Docket # 3
DPR - 22
Change Request No.

3-15-71

MAR 22 1971

ATTACHMENT TO REQUEST FOR CHANGE IN TECHNICAL SPECIFICATIONS
JUSTIFICATION FOR CHANGE AND SUPPLEMENTARY INFORMATION

In the performance of work at the Monticello Nuclear Generating Plant it will be necessary that some work be performed in the localized or confined areas of airborne concentrations in excess of the limits specified in Appendix B, Table 1, 10 CFR, Part 20. It is anticipated that certain portions of this work particularly that connected with fuel handling and equipment maintenance and repair may involve airborne concentrations sufficiently in excess of the specified limits as to make the exclusive use of the time weighted exposure limits unfeasible and excessively restricted to the proper performance of tasks which will be required.

By the prudent utilization of applicable allowances for respiratory equipment employed for these situations, the required work can be accomplished with greater safety and precision than would otherwise be possible.

The allowances herein requested are consistent with accepted and reasonable safety requirements and do not compromise the safety of personnel or the general public. Such allowances are permitted under provisions of 10 CFR 20, Section 20.103 (c) (3) to the extent authorized by the Director of Division of Licensing.

As support for this request and in compliance with Section 20.103 (c) (3), 10 CFR, Part 20, following are listed descriptions, conditions, and limitations which we propose to apply to exposures granted under this authorization:

A. Equipment descriptions, efficiencies, and application of efficiency values to determine use of equipment

Following are listed the descriptions and protection factors (based on the assumed efficiencies) of respiratory equipment which will be used as necessary for the protection of personnel against airborne radioactive materials and for which allowances are requested:

- 1) MSA "Dustfoe" mask with type H "ultrafilter" (or equivalent). A protection factor of 10 for airborne particulates and 1 for gases applies upon assurance of good face fit and proper use.
- 2) MSA full face mask with type H "ultrafilter" (or equivalent). A protection factor of 100 for airborne particulates and 1 for gases applies upon assurance of good face fit and proper use.
- 3) MSA full face mask with type GMR combination chemical and particulate canister (or equivalent). This apparatus will be used in place of items 1) and 2) if concentrations of radioiodine exceed MPC values. A protection factor of 100 applies for airborne particulate and halogen radioactive materials upon assurance of good face fit and proper use.

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- 4) MSA supplied air respirator with full face mask, air line and variable flow demand regulator (or equivalent). A protection factor of 100 applies upon assurance of good face fit and proper use.
- 5) MSA self-contained air breathing apparatus (or equivalent). Protection factors of 100 for operation in the demand regulated mode and 1000 for operation in the constant flow mode apply upon assurance of good face fit and proper use.
- 6) MSA Chemox oxygen breathing apparatus (or equivalent). A protection factor of 1000 applies upon assurance of good face fit and proper use.
- 7) MSA supplied air respirator with full face mask and positive pressure - constant flow regulator (or equivalent). A protection factor of 1000 applies upon assurance of good face fit and proper use.
- 8) Entry into areas in which airborne concentrations are, or are believed to be, in excess of MPC values shall require the wearing of at least the Dustfoe respirator or equivalent. Concentrations in excess of 10 times MPC values shall require the wearing of at least the full face mask with type H Ultra-filter or supplied air or self-contained apparatus (or equivalent) with demand regulator. Concentrations in excess of 100 times MPC values shall require the wearer of the MSA supplied air respirator (or equivalent) with constant flow air line and regulator, self-contained air breathing apparatus operated in the constant flow mode, or Chemox self-contained breathing apparatus. Entry into areas in which airborne concentrations of radioiodine exceed MPC values shall require the wearer of the full face mask type respiratory protective equipment as outlined above.

B. Fitting, Maintenance and Cleaning of Respiratory Protective Equipment

- 1) Personnel shall be trained by radiation safety personnel in the proper fitting and use of each type of respiratory protective equipment prior to their being authorized entry into the area requiring its use. This training will consist of demonstrations and practice in donning and fitting the face pieces, connecting, leak testing, and operating of the equipment as well as explanation of the purpose, characteristics, and cautions applicable to the use of each type of respiratory equipment. Retraining shall be performed annually or more frequently as specified by Radiation Safety personnel on the basis of plant operation and individual performance.

- 2) Initial testing and, as necessary, periodic retesting will be performed under the supervision of the Radiation Protection engineer to determine individual proficiency, fitting problems, and resulting restrictions, if any, of individuals in the use of each type of respiratory equipment. These fitting tests of full face mask equipment shall include the use of amyl acetate or other suitable material which will be passed about the mask-face seal. Radiation Safety personnel will be trained to perform this test safely.
- 3) Before entering an area requiring the use of respiratory equipment, each wearer will inspect the unit for condition, fit, strap adjustment, and proper operation of inhalation and exhalation valves as appropriate. Leak tightness will be checked by attempting inhalation and exhalation with appropriate portions of the apparatus valved out or blocked, as required for the type of equipment being checked, in accordance with manufacturers' recommended procedures. In the case of the Chemox breathing apparatus, additional checks will be performed to insure the integrity of the bellows, proper function of the respiratory valves, that adequate oxygen generation has been started, and that the breathing apparatus is operating properly at a slightly positive pressure. Air supply tanks will be inspected to insure an adequate supply of air. Low pressure alarms and elapsed time alarms (as applicable) will be checked for operation.
- 4) Following use, each respiratory device will be surveyed for radioactive contamination, decontaminated as necessary, cleaned, and sanitized with a bacteriostatic solution in accordance with detailed procedures. Following cleaning and sanitizing, each device will be inspected, tested, and restored as necessary to proper working condition in accordance with the procedures established by Radiation Safety personnel. Each respiratory device will then be returned to use or to its normal storage location as required. Masks shall be stored enclosed in clean plastic bags. All self-contained breathing apparatus (Chemox and tank type units) shall be stored at designated locations in their proper carrying cases.
- 5) Surveying of breathing apparatus face pieces shall include both meter surveys and smear surveys of all accessible surfaces. Decontamination shall be accomplished by washing in warm water and detergent or mild decontamination solution as required, and thoroughly rinsed and dried. Strong agents which may produce skin irritation, metal corrosion or attack of rubber parts will not be used.
- 6) Inspection of respiratory equipment shall be performed monthly for all self-contained air or oxygen breathing apparatus and no less frequent than semi-annually for all other types. Inspections and repairs shall be performed by or under the supervision of Radiation Protection Engineer.

- 7) In the inspection of respiratory equipment particular attention will be given to metal-to-rubber seals, condition of rubber parts, exhaust and inhalation valves, regulators, hoses, valves and fittings, threaded connections, eye-piece and visor connections, and seals. Damaged or badly worn components will be replaced prior to the unit being made available for service.

C. Procedures Governing Use

- 1) At Monticello Nuclear Generating Plant, no individual will knowingly cause himself or others to be exposed to concentrations of airborne radioactive material such that resulting inhalation, ingestion, or absorption of radioactive material, when averaged over a period of seven consecutive days will exceed the limits specified in Appendix B, Table 1, 10 CFR, Part 20.
- 2) Each accessible area in which airborne radioactive materials exist in concentrations in excess of the limits specified in Appendix B, Table 1, 10 CFR, Part 20 shall be posted in accordance with section 20.203 (d), 10 CFR, Part 20.
- 3) Needs for respiratory protection shall be minimized by the appropriate use of controlled-flow ventilation, containment, isolation, and dilution. Equipment design shall include appropriate provisions for minimizing the possible release of radioactive material to the respiratory environment of personnel. Personnel entries into areas requiring respiratory protection will be minimized as to frequency, duration and airborne concentrations by every reasonable means.
- 4) As a part of the normal administrative procedures employed at the Monticello Nuclear Generating Plant, all work which may involve significant quantities of radioactive materials, radiation levels, or other special safety considerations requires authorization by the Radiation Protection Engineer and the compliance with requirements specified in the Radiation Work Permit issued for the work. Entry into an area in which concentrations of airborne radioactive materials are known or suspected to be in excess of limits specified in Appendix B, Table 1, 10 CFR Part 20 shall require authorization by the Radiation Protection Engineer and compliance with the procedures and requirements so specified and shall be performed under the direct supervision of Radiation Safety personnel. The specifications for use of respiratory equipment shall include the type of equipment required and applicable exposure time limitations. The specified respiratory equipment must be suitable for the types and concentrations of airborne radioactive materials which will be encountered.

- 5) Appropriate air sampling will be performed and hazards will be suitably assessed with respect to the proper selection of breathing apparatus and evaluation of exposures.
- 6) Northern States Power Company will carry out an appropriate program to determine the effectiveness of the respiratory protection afforded during specific applications.
- 7) Average concentrations of airborne radioactive materials in normally occupied areas will be maintained at less than the limits specified in Appendix B, Table 1, 10 CFR, Part 20. Areas in which concentrations exceed these values will not be normally occupied and entry to such areas will be controlled by procedural limitations.
- 8) Normally, respiratory equipment shall not be required to be worn for periods of time in excess of two hours. If work requirements in an airborne radioactivity area requires a longer occupation time, either relief by other personnel or rest periods will be provided to assure that no hardship results from masking requirements that will discourage observance by the individual of the wear requirements. In any case, relief of personal discomfort, including egress from the area by appropriate procedures will be permitted as required.

TABLE OF PROTECTION FACTORS FOR RESPIRATORS

DESCRIPTION	MODES ⁽¹⁾	Protection Factor ⁽²⁾			
		HIGH TOXICITY ⁽³⁾	OTHER	TRITIUM OXIDE ⁽⁴⁾	OTHER
I. <u>AIR-PURIFYING RESPIRATOR</u>					
Facepiece, half mask	NP	NR ⁽⁵⁾	10	NR	10
Facepiece, full	NP	100	100	NR	100
II. <u>ATMOSPHERE-SUPPLYING RESPIRATOR</u>					
1. <u>Air-Line Respirator</u>					
Facepiece, half-mask	CF	100	100	2	100
Facepiece, full	CF	1000	1000	2	1000
Facepiece, full	D-NP	NR	100	2	100
Facepiece, half-mask	D-PP	100	100	2	100
Facepiece, full	D-PP	1000	1000	2	1000
Hood	CF	1000	1000	2	1000
Suit	CF	1000	1000	1000 ⁽⁶⁾	1000
2. <u>Self-Contained Breathing Apparatus (SBA)</u>					
Facepiece, full	D-NP	100	100	2	100
Facepiece, full	D-PP	1000	1000	2	1000
3. <u>Combination Respirator</u>					
Any combination of air-purifying and atmosphere supplying respirator		Protection factor for type and mode of operation as listed above.			

Footnotes

- (1.) CF: continuous flow
D : demand
OG: oxygen generating

OT: oxygen tank

NP: negative pressure (i.e. negative inspiratory phase)

PP: positive pressure (i.e. always positive pressure)

R: recirculating type

- (2.) (a) The Protection Factor is the reciprocal of the assumed penetration for the complete respirator. It is applied to the airborne concentration to determine the concentration inhaled by the wearer, according to the following formula:

$$\frac{\text{Airborne Concentration}}{\text{Protection Factor}} = \text{Concentration Inhaled}$$

- (b) The Protection Factors apply only for fitted respirators worn by trained individuals.
(c) The Protection Factors apply only when high efficiency particulate and/or chemical sorbent canisters appropriate to the hazard are used.

- (3.) High toxicity nuclides are as follows: Pa 231, Cf 249, Pu 239, Pu 240, Pu 242, Pu 238, Ac 227, Th 230, Np 237, Th 228, Am 241, Am 243, Cm 243, Cm 245, Cm 246, Cf 250, Cf 252, Cm 244, U 232, Ra 226, Ra 228, Sm 147, Nd 144, Pu 241, Pb 210, U 230, U 233, U 234, U 235, U 236, Cm 242, Th 227, Po 210, Ra 223, Sr 90.

- (4.) Excluding radioactive contaminants that present an absorption or submersion hazard.

- (5.) NR: Not recommended for this application.

- (6.) Limited by time of exposure and concentration causing permeation of suit.