



IN REPLY REFER TO:

Docket No. 50-29

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

SUPPLEMENTAL
FILE COPY

MAY 31 1966

Yankee Atomic Electric Company
441 Stuart Street
Boston, Massachusetts 02116

Attention: Mr. Roger J. Coe
Vice President

Gentlemen:

The Yankee Atomic Electric Company, as well as a number of other licensees, has requested authority from the Commission to use respiratory protective equipment in accordance with the provisions of 10 CFR 20.103(c)(3).

As you know, we have been considering for some time the establishment of specific standards and procedures regarding the use of respiratory protective equipment. The Commission has let a number of contracts for studies related to this problem, and has received advice and guidance from an ad hoc committee composed of a number of recognized experts representing industry, labor, research institutes, and other government agencies.

We have concluded that subject to the limitations set forth in the attached authorization, the use of respiratory protective equipment in determining the exposure of individuals to concentrations of radioactive materials in restricted areas, may be permitted for the Yankee plant.

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Accordingly, you are hereby authorized, pursuant to Section 20.103(c)(1) and (3) of 10 CFR 20, to make allowance for the use of respiratory protective equipment in conjunction with activities authorized by License No. DPR-3 in determining whether individuals in restricted areas are exposed to concentrations in excess of the limits specified in Appendix B, Table I, Column 1 of 10 CFR 20, subject to the conditions and limitations set forth in the attached authorization.

We are considering an amendment to Part 20 to provide generally for the use of respiratory protective equipment. In the event such amendment to Part 20 is issued, its requirements and limitations will supersede the provisions contained in this authorization.

Sincerely yours,

Original Signed By
R.L. Doan

R. L. Doan, Director
Division of Reactor Licensing

Enclosure:
As stated above

Distribution

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- DRL Reading
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- L. Kornblith (2)
- N. Stoner (5)
- R. Huard
- G. Page
- D. Skovholt
- P. Norian
- N. D. Mason

- bcc: H. J. McAlduff, ORO
- E. E. Hall, RA
- J. A. Harris, PI
- E. B. Tremmel, IP
- R. Leith, OC

W. J. N.
DRL
WNischan/lma
5/27/66

OGC
JPC
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RSBoyd
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DRL
EGCase
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DRL
RLDoan
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Authorization Pursuant to Section 20.103(c)(1) and (3), 10 CFR 20

Yankee Atomic Electric Company (hereinafter referred to as "the licensee") is hereby authorized, pursuant to Section 20.103(c)(1) and (3) of 10 CFR 20, to make allowance for the use of respiratory protective equipment in conjunction with activities authorized by License No. DPR-3 in determining whether individuals in restricted areas are exposed to concentrations in excess of the limits specified in Appendix B, Table I, Column 1 of 10 CFR 20, pursuant to the following conditions and limitations:

1. In circumstances in which adequate limitation of the inhalation of radioactive materials by use of process or other engineering controls is impracticable, the licensee may permit an individual in a restricted area to be exposed to average concentrations of airborne radioactive materials in excess of the limits specified in Appendix B, Table I, Column 1 of 10 CFR 20 provided:
 - A. The individual uses respiratory or other appropriate protective equipment such that the total intake, in any period of seven consecutive days by inhalation, ingestion or absorption, would not exceed that intake which would result from breathing the concentrations specified in Appendix B, Table I, Column 1 of 10 CFR 20 for a period of 40 hours.
 - B. The licensee shall advise each respirator user that he may leave the area for relief from respirator use in case of equipment malfunction, physical or psychological discomfort, or any other condition that might cause reduction in the protection afforded the wearer.
 - C. The licensee maintains a respiratory protection program adequate to assure that the objective of Item "A" above is met. Such program shall include:
 - (i) Air sampling and other surveys sufficient to identify the hazard, to evaluate individual exposure, and to permit proper selection of the respiratory protective equipment;
 - (ii) Procedures to assure proper selection, supervision and adequate training of personnel using such protective equipment;
 - (iii) Procedures to assure the adequate fitting of respirators and the testing of equipment for operability;
 - (iv) Procedures for maintenance to assure full effectiveness of respiratory protective equipment, including issuance, cleaning and decontamination, inspection, repair, and storage;
 - (v) Bio-assays of individuals and other surveys as may be appropriate to evaluate individual exposures and to assess protection actually provided; and
 - (vi) Records sufficient to permit periodic evaluation of the adequacy of the respiratory protective program.

- D. The licensee has evaluated the protective equipment⁽¹⁾ and has determined that, when used to protect against radioactive material under the conditions of use to be encountered, such equipment is capable of providing a degree of protection at least equal to the protection factors listed in Table I attached hereto⁽²⁾.
2. The licensee shall notify, in writing, the Director, Region I, Division of Compliance, U. S. Atomic Energy Commission, 376 Hudson Street, New York, New York 10014, when the respiratory protection program is initiated. Such notification shall be made within thirty (30) days after the date that allowance for the use of respiratory protective equipment is first made.
 3. The licensee shall not assign protection factors in excess of those given in Table I attached hereto in selecting equipment.

(1) In evaluating respiratory protective equipment for use against radioactive materials to assure that the equipment provides the protection factors listed in the attached Table I, the licensee may accept equipment approved under appropriate test schedules of the U. S. Bureau of Mines to the extent pertinent.

(2) The factors listed apply only to protection against radioactive materials. Additional precautions may have to be taken to protect against concurrent non-radiation hazards.

TABLE I

PROTECTION FACTORS FOR RESPIRATORS

Description	Modes ^{1/}	PROTECTION FACTORS 2/	
		Particulates and Vapors and Gases Except Tritium Oxide ^{3/}	Tritium Oxide
I. AIR-PURIFYING RESPIRATORS			
Facepiece, half-mask		10	1
Facepiece, full		100	1
II. ATMOSPHERE-SUPPLYING RESPIRATOR			
1. Air-line respirator			
Facepiece, half-mask	CF	100	2
Facepiece, half-mask	D	100	2
Facepiece, full	CF	1000	2
Facepiece, full	D	500	2
Facepiece, full	PD	1000	2
Hood	CF	1000	2
Suit	CF	4/	4/
2. Self-contained breathing apparatus (SCBA)			
Facepiece, full	D	500	2
Facepiece, full	PD	1000	2
Facepiece, full	R	1000	2
3. Combination respirator			
Any combination of air-purifying and atmosphere supplying respirator.		Protection factor for type and mode of operation as listed above.	

- ^{1/} CF: continuous flow
D : demand
PD: pressure demand (i.e., always positive pressure)
R : recirculating

- ^{2/} (a) For purposes of this authorization the protection factor is a measure of the degree of protection afforded by a respirator, defined as the ratio of the concentration of airborne radioactive material outside the respiratory protective equipment to that inside the equipment (usually inside the facepiece) under conditions of use. It is applied to the airborne concentration to determine the concentration inhaled by the wearer, according to the following formula:

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

(b) The protection factors apply:

- (i) only for individually fitted respirators worn by trained individuals and used and maintained under supervision in a well-planned respiratory protection program.
- (ii) for air purifying respirators only when high efficiency particulate filters and/or sorbents appropriate to the hazard are used.
- (iii) for atmosphere supplying respirators only when supplied with adequate respirable air.

3/ Excluding radioactive contaminants that present an absorption or submersion hazard.

4/ Appropriate protection factors must be determined taking account of the permeability of the suit to the contaminant under conditions of use. No protection factor greater than 1000 shall be used except as authorized by the Commission.

NOTE 1: Protection factors for respirators as may be approved in the future by the U. S. Bureau of Mines according to approval schedules for respirators to protect against airborne radionuclides may be used in lieu of the protection factors listed in this Table. Where additional respiratory hazards other than radioactive ones are present, especially those immediately dangerous to life, the selection and use of respirators shall also be governed by the approvals of the U. S. Bureau of Mines in accordance with their applicable schedules.

NOTE 2: Radioactive contaminants for which the concentration values in Appendix B, Table I of 10 CFR Part 20 are based on internal dose due to inhalation may, in addition, present external exposure hazards at higher concentrations.

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