



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 180 TO FACILITY OPERATING LICENSE NO. DPR-50

METROPOLITAN EDISON COMPANY
JERSEY CENTRAL POWER & LIGHT COMPANY
PENNSYLVANIA ELECTRIC COMPANY
GPU NUCLEAR CORPORATION

THREE MILE ISLAND NUCLEAR STATION, UNIT NO. 1

DOCKET NO. 50-289

1.0 BACKGROUND

By letter dated August 9, 1993, GPU Nuclear Corporation (GPUN/licensee), submitted a request to the U.S. Nuclear Regulatory Commission (NRC) for changes to the Three Mile Island Nuclear Station, Unit No. 1 (TMI-1) Technical Specifications (TS). The amendment revises the plant TS to reflect a major revision to 10 CFR Part 20, "Standards for Protection Against Radiation." The revised Part 20 Rule was published in the Federal Register on May 21, 1991 (56 FR 23360) and is required to be implemented by January 1, 1994. The purpose of the rule change was to modify the NRC's radiation protection standards to reflect developments in the principles and scientific knowledge underlying radiation protection that have occurred since Part 20 was originally issued more than 30 years ago. The new rule also implements 1987 Presidential guidance on occupational radiation exposure. During a conference call between the NRC staff and the GPUN staff on December 7, 1993, certain minor word changes were agreed upon to the bases for TS Section 3.1.6 (TS page 3-14). These changes make the bases consistent with regard to radiation dose versus dose rate.

The radiation protection standards in the revised Part 20 Rule are based on the following assumptions:

- (1) Within the range of exposure conditions usually encountered in radiation work, there is a linear relationship, without threshold, between dose and the probability of stochastic (randomly occurring) health effects (such as latent cancer and genetic effects) occurring;
- (2) The severity of each type of stochastic health effect is independent of dose; and
- (3) Nonstochastic (nonrandom) radiation-induced health effects can be prevented by limiting exposures so that doses are below the thresholds for their induction.

The rule change also revised several definitions and introduced some new ones relative to radiation exposure guidelines. It also introduced the new international system of units (SI) for dose and radioactivity, those being the gray, sievert, and becquerel. However, licensees are permitted to continue using the units rad, rem, and curie.

2.0 EVALUATION

The licensee has proposed revising the TS to include wording that is consistent with the revised 10 CFR Part 20, "Standards for Protection Against Radiation", and will retain the same overall level of effluent control required to meet the design objectives of Appendix I to 10 CFR Part 50.

The proposed TS changes and evaluations follow:

(1) Technical Specification 3.1.6.6 and bases for Section 3.1.6

The licensee has proposed substituting "Specification 3.22.2.1" for "10 CFR 20" as the reference for the action required to evaluate the safety significance of reactor coolant leakage. A similar change is proposed for the BASES for this section of the TS. The wording of the last two sentences in the third paragraph of TS page 3-14 are slightly different than those submitted by the licensee. These changes corrected a previously existing error in the discussion of dose versus dose rate and were agreed upon during a conference call with the licensee on December 7, 1993.

These changes are considered to be editorial and are acceptable.

(2) Technical Specification 3.21.1 Bases

The licensee has proposed revising the Bases to reflect a setpoint for the radioactive effluent monitoring instrumentation of ten times the effluent concentrations listed in 10 CFR Part 20. This is a change only to a BASES section and is acceptable.

(3) Technical Specification 3.21.2 Bases

The licensee has proposed to revise the words "... the limits of 10 CFR Part 20" to read "... the limits specified in 10 CFR 20.1301" to more specifically reflect the requirements of Paragraph 20.1301, which is entitled "Radiation Dose Limits for Individual Members of the Public." This TS section specifies requirements for establishing setpoints for radioactive gaseous process and effluent monitoring instrumentation.

This change is administrative in nature to incorporate the corresponding revised 10 CFR Part 20 paragraph and is acceptable.

(4) Technical Specification 3.22.1 (Liquid Effluent) and Bases

The licensee has proposed to change the words "... concentrations specified in 10 CFR Part 20, Appendix B, Table II, Column 2" to read "... ten times the concentrations specified in 10 CFR 20.1001-20.2401, Appendix B, Table 2, Column 2" in the TS and in the BASES. A reference to 10 CFR Part 20.106(e) in the BASES is also being changed to 10 CFR Part 20.1301 to conform with the corresponding new section.

The licensee has proposed this change in order to retain operational flexibility consistent with Appendix I to 10 CFR Part 50, concurrent with the implementation of the revised 10 CFR Part 20.

The current requirements for the content of the licensee's TS concerning radioactive effluents are contained in 10 CFR 50.36a. 10 CFR 50.36a requires licensees to maintain control over radioactive material in gaseous and liquid effluents to unrestricted areas, produced during normal reactor operations, to levels that are as low as is reasonably achievable (ALARA). For power reactors, Appendix I to 10 CFR Part 50 contains the numerical guidance to meet the ALARA requirement. The dose values specified in Appendix I of 10 CFR Part 50 are small percentages of the implicit limits in 10 CFR 20.106 and the explicit limits in 10 CFR 20.1301. As secondary controls, the instantaneous dose rates required by the proposed TS were chosen by the staff to help maintain annual average releases of radioactive material in gaseous and liquid effluents to within the dose values specified in Appendix I of 10 CFR Part 50. For the purposes of the proposed TS, 10 CFR Part 20 is used as a source of reference values only. These TS requirements allow operational flexibility, compatible with considerations of health and safety, which may temporarily result in release rates which, if continued for the calendar quarter, would result in radiation doses higher than specified in Appendix I of 10 CFR Part 50. However, these releases are within the implicit limits in 10 CFR 20.106 and the explicit limits in 10 CFR 20.1302, which reference Appendix B, Table II concentrations. These referenced concentrations in the old 10 CFR Part 20 are specific values which relate to an annual dose of 500 mrem. The liquid effluent radioactive effluent concentration limits given in 10 CFR 20.1001-20.2401, Appendix B, Table 2, Column 2, are based on an annual dose of 50 mrem total effective dose equivalent. Since an instantaneous release concentration corresponding to a dose rate of 500 mrem/year has been acceptable as a TS limit for liquid effluents, which applies at all times to assure that the values in Appendix I of 10 CFR Part 50 are not likely to be exceeded, it is not necessary to reduce this limit by a factor of ten.

The licensee states that operational history at TMI-1 has demonstrated that the use of the concentration values associated with 10 CFR 20.106 as TS limits has resulted in calculated maximum individual doses to a member of the public that are small percentages of the values given in Appendix I to 10 CFR Part 50. Therefore, the use of effluent concentration values

that are ten times those listed in Appendix B, Table 2, Column 2 to 10 CFR 20.1001-20.2401 will not have a negative impact on the ability to continue to operate within the design objectives in 10 CFR Part 50, Appendix I and 40 CFR Part 190.

Based on the above, it is acceptable that the instantaneous limits associated with the liquid release rate TS are based on ten times the effluent concentration values given in 10 CFR 20.1001-20.2401, Appendix B, Table 2, Column 2, to apply at all times.

(5) Technical Specification 3.22.1.4 Bases

The licensee has proposed to change the words "... limits of 10 CFR Part 20, Appendix B, Table II, Column 2" to read "... limits of 10 CFR 20.1001-20.2401, Appendix B, Table 2, Column 2..." in the BASES.

The change is administrative in nature to be consistent with the revised 10 CFR Part 20 and is acceptable.

(6) Technical Specification 3.22.2.1

The Limiting Condition for Operations for this TS reads as follows:

3.22.2.1 "The dose rate due to radioactive materials released in gaseous effluent from the site (See Figure 5-3) shall be limited to the following:

- a. For noble gases: less than or equal to 500 mrem/yr to the total body and less than or equal to 3000 mrem/yr to the skin, and
- b. For I-131, I-133, tritium and all radionuclides in particulate form with half-lives greater than 8 days: less than or equal to 1500 mrem/yr to any organ."

The licensee does not propose to change the TS but has proposed changing the discussion in the BASES to reflect that the TS provides reasonable assurance that the annual dose at the site boundary from gaseous effluent from all units on the site will be within the annual dose limits of 10 CFR Part 20 for unrestricted areas while providing sufficient operational flexibility in establishing effluent monitor setpoints. The licensee believes this change is necessary in order to retain operational flexibility consistent with 10 CFR Part 50, Appendix I, concurrent with the implementation of the revised 10 CFR Part 20.

The current requirements for the content of the licensee's TS concerning radioactive effluents are contained in 10 CFR 50.36a. 10 CFR 50.36a requires licensees to maintain control over radioactive material in gaseous and liquid effluents to unrestricted areas, produced during normal reactor operations, to levels that are ALARA. For power reactors, Appendix I to 10 CFR Part 50 contains the numerical guidance to meet the

ALARA requirement. The dose values specified in Appendix I of 10 CFR Part 50 are small percentages of the implicit limits in 10 CFR 20.106 and the explicit limits in 10 CFR 20.1301. As secondary controls, the instantaneous dose rates required by this specification were chosen by the staff to help maintain annual average releases of radioactive material in gaseous and liquid effluents to within the dose values specified in Appendix I of 10 CFR Part 50. For purpose of the bases of this TS, 10 CFR Part 20 is used as a source of reference values only. These TS requirements allow operational flexibility, compatible with considerations of health and safety, which may temporarily result in release rates which, if continued for the calendar quarter, would result in radiation doses higher than specified in Appendix I of 10 CFR Part 50. However, these releases are within the limits specified in 10 CFR 20.106 (10 CFR 20.1302).

This specification is acceptable as a TS limit for gaseous effluents, which applies at all times as an assurance that the values in Appendix I of 10 CFR Part 50 are not likely to be exceeded. The discussion in the BASES was changed slightly from that proposed by the licensee to compare actual expected dose rate for the maximum leak rate to 0.5 Rem per year.

(7) Technical Specification 3.22.4

The licensee has proposed to revise the reference in the Action Statement and the BASES from 10 CFR Part 20.405c to 10 CFR Part 20.2203(b), and the reference in the BASES from 10 CFR Part 20 by 46 FR 18525 to 10 CFR Part 20.2203.

The change is administrative in nature to incorporate the corresponding revised 10 CFR Part 20 section numbers and is acceptable.

(8) Technical Specification 3.22.4

The licensee has proposed to update the references in the TS and BASES for submitting a Special Report as defined in 10 CFR 20.2203.

The change is administrative in nature and is acceptable.

(9) Technical Specification 6.9.1.B.1

The licensee has proposed to update the reference regarding annual reports to 10 CFR 20.2206 and to add the words "for whom monitoring was required" to the reporting requirement.

These changes are administrative in nature to incorporate the corresponding revised 10 CFR Part 20 section number and requirements and are acceptable.

(10) Technical Specification 6.10. (RECORD RETENTION)

The licensee has proposed to change the record retention requirements for solid radioactive shipments from five years to the duration of the license consistent with the revision to 10 CFR Part 20 by moving the requirement from TS 6.10.1 to TS 6.10.2. Additionally, TS 6.10.2.d is being revised to clarify the requirement for retention of records of radiation doses for only those people for whom monitoring was required. Finally, TS 6.10.3 is being moved to TS 6.10.2 for consistency.

These changes are administrative in nature to incorporate the revised 10 CFR Part 20 requirements and are acceptable.

(9) Technical Specification 6.12

The licensee has proposed to revise the words that describe a high radiation area consistent with the revised 10 CFR Part 20 and to update the appropriate reference from 20.203(c)(2) to 20.1601 of 10 CFR Part 20. The change is administrative in nature to delete an obsolete position title and is acceptable.

These changes are administrative in nature to incorporate the revised 10 CFR Part 20 requirements and are acceptable.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Pennsylvania State official was notified of the proposed issuance of the amendment. The State official had no comments.

4.0 ENVIRONMENTAL CONSIDERATION

The amendment changes requirements with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes the surveillance requirements. The amendment also relates to changes in recordkeeping, reporting, or administrative procedures or requirements. The NRC staff has determined that the amendment involves no significant increase in the amounts or types of effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (58 FR 59751). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) and (10). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

5.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

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Date: December 21, 1993