



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
SUPPORTING AMENDMENT NO. 49 TO PROVISIONAL OPERATING LICENSE NO. DPR-20  
CONSUMERS POWER COMPANY  
PALISADES PLANT  
DOCKET NO. 50-255

Introduction

By letter dated December 18, 1978, as supplemented January 12, 1979, Consumers Power Company (CPC) requested an amendment to License No. DPR-20 to allow changes to Section 5.4 of the Technical Specifications for the Palisades Plant. The proposed changes would revise the enrichment limit for fuel assemblies in the new and spent fuel storage racks from 3.2 weight percent U-235 to 3.27 weight percent U-235. The purpose of the change is to allow storage of irradiated and unirradiated fuel assemblies containing 3.27 weight percent U-235.

Evaluation

The Palisades Plant has a new (unirradiated) fuel storage area containing dry racks and a spent fuel storage pool containing unpoisoned low capacity spent fuel storage racks and poisoned high capacity spent fuel storage racks. Section 5.4 of the Palisades Plant Technical Specifications includes limitations to prevent criticality in these storage racks. The general limitation for all stored fuel is that the  $k_{eff}$ , which includes all uncertainties, be less than or equal to 0.95 when the racks in which the fuel assemblies are stored are flooded with unborated water. Since the  $k_{eff}$  in an array of stored fuel is not a quantity which is measured with good accuracy, only the calculated values are available. To preclude any unreviewed increase, or increased uncertainty, in the calculated value of  $k_{eff}$  which could raise the actual  $k_{eff}$  in the fuel pool above 0.95 without being detected, a limit on the maximum fuel loading is also specified. This limit is specified in terms of grams of U-235 per axial centimeter of fuel assembly. For the normal dry storage of new fuel assemblies an additional limitation requires that the  $k_{eff}$  not exceed 0.98 when it is assumed that the new fuel racks are filled with fuel assemblies containing the maximum allowable loading of U-235 and with optimum neutron moderation, i.e. H<sub>2</sub>O in an aerosol or foam.

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The proposed revision to the Technical Specifications would state the criticality limits in the new fuel storage racks as a  $k_{eff}$  of 0.95 in a credible flooded condition and an enrichment limit of 3.30 weight percent U-235. The revised specification for new fuel in the high capacity spent fuel storage racks would add an enrichment limitation of 3.27 weight percent of U-235. The proposed revision would increase the allowable fuel enrichment and grams of U-235 per axial centimeter of active fuel for spent fuel in the high capacity storage racks from 3.05 weight percent and 38.3 grams/centimeter to 3.27 weight percent and 41.24 grams/centimeter respectively. The limitations for the low capacity racks would not be changed.

We have reviewed the licensee's calculational assumptions and methodology and have compared their proposed limits and bases with the guidance provided in the Commission's Standard Review Plan (SRP) Section 9.1.1 and 9.1.2 and the Standard Technical Specifications (STS). The calculational methods used to assess the criticality safety of the fuel in the spent storage racks are the same as those reviewed and approved by Amendment No. 29 to DPR-20 dated June 30, 1977 and are therefore acceptable. The calculations show that, with a maximum loading of 38.3 grams of U-235/cm in the low capacity racks and a maximum loading of 41.24 grams of U-235/cm in the high capacity racks and new fuel racks,  $k_{eff}$  will be less than 0.95 even with the racks flooded with unborated water. In addition,  $k_{eff}$  in the new fuel racks will remain below 0.98 even with optimum conditions of moderation. These values of  $k_{eff}$  are consistent with the guidance contained in Section 9.1.1 and 9.1.2 of the SRP and are therefore acceptable.

The proposed technical specifications include limitations on both enrichment and grams of U-235 per axial centimeter. A limitation on enrichment is redundant and unnecessary if grams of U-235 per axial centimeter is established. Furthermore, in our opinion, the proposed limitation is not as clear as the language used in the NRC STS. Therefore, we have modified the statement of the limitations to conform with the STS. This modification has been discussed with and agreed upon by representatives of CPC.

#### Environmental Consideration

We have determined that the amendment does not authorize a change in effluent types, an increase in total amounts of effluents or an increase in power level and therefore will not result in any significant environmental impact. Having made this determination, we have concluded, pursuant to 10 CFR §51.5(d)(4), that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

Conclusion

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability of consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does not involve a significant hazards consideration. (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Date: May 29, 1979

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