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

ENVIRONMENTAL ASSESSMENT BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATING TO THE CHANGE IN EXPIRATION DATE OF

FACILITY OPERATING LICENSE NOS. DPR-29 AND DPR-30

COMMONWEALTH EDISON COMPANY

QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2

DOCKET NOS. 50-254 AND 50-265

1.0 INTRODUCTION

The U.S. Nuclear Regulatory Commission (the Commission) is considering the issuance of a proposed amendment which would extend the expiration dates of the Full-Term Operating Licenses (FTOL) for the Quad Cities Nuclear Power Station, Units 1 and 2. The expiration date for License Nos. DPR-29 and DPR-30 for Quad Cities Units 1 and 2, respectively, would be extended from February 15, 2007 to December 14, 2012. Quad Cities Units 1 and 2, are operated by Commonwealth Edison Company (the licensee) and are located in Rock Island County, Illinois.

2.0 IDENTIFICATION OF THE PROPOSED AMENDMENT

The currently licensed term for Quad Cities Units 1 and 2, is 40 years commencing with the issuance of the construction permit on February 15, 1967. Accounting for the time that was required for construction of the units, this represents an effective operating license term of approximately thirty four years and three months. The licensee's application of November 30, 1989 requests extension of the expiration date of the Operating Licenses to December 14, 2012. With this proposed expiration date, the 40 year operating term for the license would start with issuance of the Operating Licenses rather than the Construction Permit.

3.0 THE NEED FOR THE PROPOSED ACTION

The granting of the proposed license amendment would allow the licensee to operate Quad Cities, Units 1 and 2, for approximately five years and nine months beyond the currently approved license expiration date. Without the issuance of the proposed license amendment, Quad Cities, Units 1 and 2, would be shut down at the end of the currently approved license term.

4.0 ENVIRONMENTAL IMPACT OF THE PROPOSED ACTION

In September 1972, the U.S. Atomic Energy Commission issued the Final Environmental Statement (FES) for the Quad Cities Nuclear Power Station, Units 1 and 2. This document was issued in support of Operating Licenses for Quad Cities, Units 1 and 2. The staff has reviewed the Quad Cities FES and additional information to determine the environmental impact of operation of Quad Cities, Units 1 and 2, for an additional five years and nine months.

4.1 Radiological Impacts

The staff has considered potential radiological impacts to the general public in the vicinity of the Quad Cities Nuclear Power Station. These impacts include potential accidents and normal radiological releases. In addition, the staff has considered the impacts of the radiation exposure to workers at Quad Cities. Finally, the impact on the transportation of fuel and waste have been considered. The above impacts are summarized in Sections 4.1.1 through 4.1.3 herein.

4.1.1 General Public

In the FES, dated September 1972, the staff calculated the dose commitment to the population residing around the Quad Cities site to assess the impacts on people from radioactive material released as part of the normal operation of the plant. Tables 11 and 12 of the FES list the estimated doses associated with the operation of Quad Cities, Units 1 and 2. The combined dose from both units are below the annual dose design objectives of 10 CFR Part 50, Appendix I, and would not be significant.

The staff has assessed the public risks from reactor accidents per year of operation and other reactors of comparable design and power level. In all cases, the estimated risk of early fatalities and latent cancer fatalities per year of reactor operation have been small compared to the risks of many non-reactor type of accidents to which the public is typically exposed and the natural incidence of fatal cancers. The annual risk associated with the reactor accidents did not increase with longer periods of operation of the reactor. If similar risks were estimated for Quad Cities Units 1 and 2, we would expect a similar conclusion. Further, as shown in Table 16 of the Quad Cities FES, the integrated exposure to population within a 50-mile radius of the Quad Cities site from each postulated accident would be orders of magnitude smaller than that from naturally occurring background radiation. When considered with the probability of occurrence, the annual potential radiation exposure of the population from all the postulated accidents is an even smaller fraction of the exposure from natural background radiation and, in fact, is well within naturally occurring variation in the natural background. The staff concludes that the proposed additional years of operation would not increase the annual public risk from reactor accidents.

Current projections of population within the 5-mile, 10-mile and 50-mile radius of the station are lower than the projection in the FES. For example, the population for the city of Clinton, Iowa (located approximately 7 miles north of the Quad Cities Station) has actually decreased from 43,419 in 1970 to 32,828 in 1980. Additionally, the census population estimates for Clinton estimates a population of 29,630 in 1988 and 27,930 in 2000. Similarly, 1990 population projections for the 5-mile radius were 5,489 which is less than the estimated 6,227 population projection for 1990 in the FES. Current population estimates for the 50-mile radius in the year 2000 are 807,087 and are less when compared to the year 2000 projection contained in the FES.

4.1.2 Occupational Exposures

The staff has evaluated the licensee's dose assessment for the additional years during which Quad Cities, Units 1 and 2, would operate, and compared it with current Quad Cities and overall industry dose experience. In 1986-1988, Quad Cities Station collective radiation exposure was well below industry averages. In 1989, the radiation exposure was 900 person-rem and closely followed the industry average. The increase in the 1989 exposure was essentially due to high exposure modification work such as the modification of the reactor water clean-up flued head anchors. The licensee does not expect any increases in station dose during the additional period of five and three quarter years for license extension. It is currently anticipated that the average dose exposure rates for 1995 will be approximately 460 person-rem. It is expected that state-of-the-art technologies that will be used, including some use of remote handling equipment, chemistry controls, and system chemical decontamination, should ensure that exposure accumulation during the extended period is maintained ALARA. The staff expects that the increased doses from maintenance and corrosion product buildup will be offset by a continually improving ALARA program and dose saving plant modifications.

Historical performance at Quad Cities Station with respect to Personnel Contamination Events (PCEs) demonstrates a decreasing trend. In 1987, there were 528 events; in 1988, 472 events; and in 1989, 326 events. The increased emphasis on housekeeping and the reduction of contaminated areas as well as aggressive investigations has contributed to the reduction of personnel contamination events.

Additional occupational exposures will result from decommissioning of Quad Cities, Units 1 and 2, although these doses will be incurred with or without the license extension periods. Any increases in corrosion product buildup during the period of extension will be compensated for by improved chemistry controls and other ALARA measures. Consequently, the extended operating times should have no measurable adverse effect on decommissioning dose requirements.

Installed spent fuel capacity for Quad Cities, Units 1 and 2, is 6801 assemblies, therefore, a loss of full core discharge capability will be reached in 2002. Additional storage capability is available to increase the capacity to 7554 (full core discharge capability to 2005). The licensee, has a contract with the Department of Energy for removal (from the plant) and disposal of spent fuel commencing in 1998. The licensee, to date, has no definite plans for expansion of the on-site storage of spent fuel in the event this fuel removal is delayed by DOE and additional on-site storage is required. However, the licensee has stated that fuel consolidation and on-site dry storage options are being strongly considered.

The staff concludes that the licensee's dose assessment is acceptable and that the radiation protection program at Quad Cities is adequate to ensure that occupational radiation exposures will be maintained ALARA and in continued compliance with the requirements of 10 CFR Part 20.

The staff concludes that the environmental impact associated with 40-year operating license duration is not significantly different from those associated with the approximately 34-year operating term authorized by the existing licenses and those previously assessed in the Quad Cities FES.

4.1.3 Transportation of Fuel and Waste

The staff has reviewed the environmental impacts attributable to the transportation of fuel and waste to and from the Quad Cities site. With respect to the normal conditions of transport and possible accidents in transport, the staff concludes that the environmental impacts are bounded by those identified in Table S-4 of 10 CFR 51.52, "Environmental Impact of Transportation of Fuel and Waste To and From One Light Water-Cooled Nuclear Power Reactor." The bases for this conclusion are that (1) Table S-4 is based on an annual refueling and assumption of 60 spent fuel shipments per reactor year. At the present time, Quad Cities, Units 1 and 2, are on a 18-month refueling cycle which will result in fewer than 60 spent fuel shipments per year. Reducing the number of fuel shipments reduces the overall impacts related to population exposure and accidents discussed in Table S-4, and (2) Table S-4 represents the contribution of such transportation to annual radiation dose per reactor year to exposed transportation workers and to the general public. The licensee projects that spent fuel may slightly exceed the average fuel irradiation level specified in 10 CFR 51.52(a)(3) as the bases for Table S-4, but will be less than 60 gigawatt days per metric ton (GWD/MTU). The NRC has previously found (53 FR 6040, February 29, 1988) that the environmental impacts summarized in Table S-4 of 10 CFR 51.52 are conservative and bound the corresponding impacts for burnup levels up to 60 GWD/MTU. Quad Cities Station's projected burnup level is about 25 GWD/MTU. The radiation levels of transport fuel casks are limited by the Department of Transportation and are not dependent on fuel enrichment and/or irradiation levels. Therefore, the estimated doses to exposed individuals per reactor year will not increase over that specified in Table S-4.

The annual radiation dose to individuals would not be changed by the extended period of operation. Although some integral risk with respect to normal conditions of transportation and possible accidents in transport would be attributed to the additional years of operation, the integral risk would not be significant because the annual risk for such transportation incidents is small.

4.2 Non-Radiological Impacts

The staff has reevaluated the non-radiological impacts associated with operation of Quad Cities, Units 1 and 2, to include the approximately 5.75 additional years of operation associated with the change in the expiration date of the operating licenses. The non-radiological impacts, primarily on water and land use, are shown in the FES to be quite minor. Continued plant operation during the additional time period would also have a minor impact, especially when compared to the impacts associated with construction of replacement power capability. We conclude that the non-radiological impacts associated with the proposed change in the operating license expiration date is acceptable.

5.0 ALTERNATIVES TO THE PROPOSED ACTION

The principle alternative to issuance of the proposed license extension would be to deny the application. In this case, Quad Cities, Units 1 and 2, would shut down upon expiration of the present operating licenses.

In Chapter XI of the Quad Cities FES, a cost-benefit analysis is presented for Quad Cities, Units 1 and 2. Operation of Quad Cities, Units 1 and 2, in the present plant configuration would only require incremental yearly costs. These costs would be substantially less than the purchase of replacement power or the installation of new electrical generating capacity. Moreover, the overall cost per year of the facility would decrease since the large initial capital outlay would be averaged over a greater number of years. In summary, when compared to alternative electrical power the cost-benefit advantage of generating capacity for Quad Cities improves with the extended plant lifetime.

6.0 ALTERNATIVE USE OF RESOURCES

This action does not involve the use of resources not previously considered in connection with the September 1972 FES.

7.0 AGENCIES AND PERSONS CONSULTED

The NRC staff reviewed the licensee's request and did not consult other agencies or persons.

8.0 BASIS AND CONCLUSIONS FOR NOT PREPARING AN ENVIRONMENTAL IMPACT STATEMENT

The Commission has determined not to prepare an environmental impact statement for the proposed action. The staff has reviewed the proposed license amendment relative to the requirements set forth in 10 CFR Part 51. Based on this assessment, the staff concludes that there are no significant radiological or non-radiological impacts associated with the proposed action and will not change any conclusions reached by the Commission in the FES. Therefore, pursuant to 10 CFR 50.31, an environmental impact statement need not be prepared for this action. Based upon this environmental assessment, the Commission concludes that the proposed action will not have a significant effect on the quality of the human environment.

Dated: December 27, 1990