



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
SUPPORTING AMENDMENT NO. 106 TO FACILITY OPERATING LICENSE NO. DPR-25
COMMONWEALTH EDISON COMPANY
DRESDEN NUCLEAR POWER STATION, UNIT NO. 3
DOCKET NO. 50-249

1.0 INTRODUCTION

By application dated September 29, 1986, Commonwealth Edison Corporation (CECO), the licensee, requested an amendment to Facility Operating License No. DPR-25 for Dresden Nuclear Power Station Unit No. 3. The proposed amendment would change the expiration date of the license from October 14, 2006 to January 12, 2011.

2.0 DISCUSSION

Section 103.c of the Atomic Energy Act of 1954 provides that the license is to be issued for a specified period not exceeding 40 years. The Code of Federal Regulations at 10 CFR 50.51 specifies that each license will be issued for a fixed period of time, to be specified in the license, not to exceed 40 years from the date of issuance. Section 50.57 of 10 CFR allows the issuance of an operating license pursuant to 10 CFR 50.56 for the period specified in 10 CFR 50.51 after the construction of the facility has been substantially completed, in conformity with the construction permit and when other provisions specified in 10 CFR 50.57 are met. The current term of the license for the Dresden Nuclear Power Station Unit 3 is 40 years commencing with the issuance of the construction permit. Accounting for the time that was required for plant construction, this represents an effective operating term of only 35 years and nine months. Consistent with Section 103.c of the Atomic Energy Act of 1954 and 10 CFR Parts 50.51, 50.56 and 50.57 of the Commission's regulation, the licensee, by its application dated September 29, 1986, seeks an extension of the operating license term for the Dresden Nuclear Power Station Unit 3 such that the fixed period of the license would be 40 years from the date of issuance of the operating license.

The impact of additional radiation exposure to the facility operating staff and the impact on the general population in the vicinity of the Dresden Nuclear Power Station are addressed in the NRC's staff's Environmental Assessment dated March 1, 1990.

3.0 EVALUATION

The licensee's request for extension of the operating license is based on the fact that a 40-year service life was considered during the design and construction of the plant. This does not mean that some components will not wear out during the plant lifetime. However, the reactor coolant system

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components and support systems are analyzed for the integrated effects of radiation damage and cyclic loadings (with added margin) which could reasonably be expected to occur in a 40-year lifetime. Surveillance and inspection programs have been implemented in accordance with ASME Code for Inservice Inspection and Inservice Testing of Pumps and Valves and Technical Specification requirements to provide assurance that any unexpected degradation in plant equipment will be identified and corrected. The specific provisions and requirements for ASME Code testing are set forth in 10 CFR 50.55a.

✓ The design of the reactor vessel and its internals considered the effects of 40 years of operation at full power and a comprehensive vessel material surveillance program is maintained in accordance with 10 CFR Part 50, Appendix H which ensures the fracture toughness requirements of Appendix G are met. As stated in the Final Safety Analysis Report (FSAR), reactor vessel surveillance capsules are periodically removed for Charpy V-notch and tensile strength tests.

As discussed above, the useful life of Dresden Unit 3 was intended to be 40 years. The thermal and loading cycles listed in Dresden's original FSAR were considered during the design process. The licensee has stated that Dresden Station routinely monitors the number of these cycles experienced. Extrapolation of data accumulated thus far indicates that Unit 3 can operate for its full 40-year design life without exceeding the design number of vessel cycles.

Inspections conducted at several boiling water reactors (BWRs) indicated intergranular stress corrosion cracking (IGSCC) has occurred in large-diameter stainless steel pipe. The NRC staff considered this a generic problem and as a result, the Commission issued Generic Letter 84-11 requiring a re-inspection program at all BWRs, involving welds in stainless steel pipes greater than 4 inches in diameter, in systems that are part of or connected to the reactor coolant pressure boundary, out to the second isolation valve. If IGSCC was discovered, repair, analysis and additional surveillance were required to ensure the continued integrity of the affected pipe.

During the 1985-1986 refueling outage for Dresden Unit 3, the licensee replaced Type 304 stainless steel recirculation system piping, the stainless steel portion of the residual heat removal system piping, and the reactor water cleanup system piping out to the containment outboard isolation valves with Type 316 Nuclear Grade (NG) material. The replacement piping, components, and supports were analyzed, constructed and tested in compliance with appropriate subsections of Sections III and XI of the ASME Boiler and Pressure Vessel Code, 1980 Edition, including the Winter 1982 Addenda.

Generic Letter 88-01, issued on January 25, 1988, superseded Generic Letter 84-11, and included a copy of NUREG-0313, Revision 2, "Technical Report on Material Selection and Processing Guidelines for BWR Coolant Pressure Boundary Piping." NUREG-0313, Revision 2, describes methods acceptable to the staff to control the susceptibility of BWR ASME Boiler and Pressure Vessel Code Class 1, 2, and 3 pressure boundary piping and safe ends to intergranular

stress corrosion cracking. The revision describes the technical bases for the staff's positions on the following items: materials of construction; processes to minimize or control IGSCC; water chemistry; reinforcement by weld overlay; replacement of piping; stress improvements; clamping devices; crack characterization and repair criteria; inspection methods, schedules, and personnel; and limits on number of cracked weldments in piping. For piping that does not conform to the staff positions, varying degrees of inservice inspection are required to ensure structural integrity of the pressure boundary piping system, pursuant to paragraph 50.55a(g)(6)(ii) of 10 CFR Part 50.

By letter dated July 29, 1988 and supplemented by responses dated December 21, 1988, March 1 and May 22, 1989, Commonwealth Edison Company responded to Generic Letter 88-01, describing the licensee's plans and program for implementation of the NRC staff's positions specified in the Generic Letter. The licensee response is currently under staff review.

Aging analyses have been performed for all safety-related electrical equipment in accordance with 10 CFR 50.49, "Environmental Qualification of Electrical Equipment Important to Safety for Nuclear Power Plants," identifying qualified lifetimes for this equipment. These lifetimes have been incorporated into plant equipment maintenance and replacement practices to ensure that all safety-related electrical equipment remains qualified and available to perform its safety related function regardless of the overall age of the plant.

The staff's Safety Evaluation for environmental qualification of safety-related electrical equipment was issued in a letter dated February 12, 1986. A subsequent audit of the program was conducted May 19 through May 23, 1986 by Region III, the results of which are documented in a Inspection Report 50-249/86-015 dated September 8, 1986. While some deficiencies were noted, which the licensee has subsequently corrected, the staff has concluded and the inspection team verified that the licensee has implemented an environmental qualification program meeting the requirements of 10 CFR 50.49.

The staff published its original Safety Evaluation for Dresden on November 18, 1970. While changes have been made to the plant design since the original plant construction was completed, such as a spent fuel pool modification, major changes for fire protection in response to Appendix R, many TMI Task Action Plan modifications and various other less major design changes, each of these changes where it involved a safety-related component has been reviewed and approved by the staff with the details being documented in the staff's related Safety Evaluation. Further, as required by 10 CFR 50.71(e), these changes and their effect on accident analyses, if any, are routinely updated in the FSAR. Our review of the original Safety Evaluation and Addenda and the FSAR for the facility has not identified any concerns associated with approval of the proposed amendment to extend the expiration date of the license that are not already addressed by licensee commitments, operating procedures, and license requirements.

The Dresden site consists of a tract of land containing 2526 acres dedicated to the station and cooling pond. Dresden Station is located in a relatively low population area. The low population zone (LPZ) is approximately the area enclosed by an 8000 meter (5-mile) radius from the plant. The population in

the area surrounding the site has grown at a somewhat faster rate than projected in the FES for the year 1980 (10,415 compared to 8,048 projected). However, current projection of population within the 50-mile radius of the station to the year 2010 is substantially lower than that projected in the FES for the year 2000 (7,366,584 compared to 12,900,000). Further details of the staff's review are contained in the associated Environmental Assessment dated March 1, 1990.

Based on the above, it is concluded that the extension of the operating license for the Dresden Nuclear Power Station, Unit 3 to allow a 40-year service life is consistent with the safety analysis in that all issues associated with plant aging and population changes have already been addressed. Accordingly, the staff finds the proposed extension of the expiration date of the Facility Operating License for the Dresden Nuclear Power Station, Unit 3, to be acceptable.

4.0 SUMMARY OF FINDINGS

The NRC staff concluded in the Environmental Assessment that the annual radiological effects during the additional years of operation that would be authorized by the proposed license amendments are not more than were previously estimated in the Final Environmental Statement, and are acceptable.

The staff concludes from its considerations of the design, operation, testing and monitoring of the mechanical equipment, structures, and the reactor vessel that an extension of the operating licenses for Dresden Unit 3 to a 40-year service life is consistent with the FSAR, SERs, and submittals made by the licensee, and that there is reasonable assurance that the unit will be able to continue to operate safely for the additional period authorized by this amendment. The plant is operated in compliance with the Commission's regulations, and issues associated with plant degradation have been adequately addressed.

In summary, we find that extension of the operating license for Dresden Unit 3 to allow 40-year service life is consistent with the Final Environmental Statement and the Safety Evaluation Report for Dresden and that the Commission's previous findings are not changed.

5.0 ENVIRONMENTAL CONSIDERATION

Pursuant to 10 CFR 51.21, 51.32, and 51.35, an Environmental Assessment and finding of no significant impact has been prepared and published in the Federal Register on March 26, 1990 (55 FR 11071). Accordingly, based upon the Environmental Assessment, the Commission has determined that the issuance of this amendment will not have a significant effect on the quality of the human environment.

6.0 CONCLUSION

The staff 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; and (2) 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.

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Dated: April 24, 1990