



**Consumers
Power**

**POWERING
MICHIGAN'S PROGRESS**

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DOCKET 50-255 - LICENSE DPR-20 - PALISADES PLANT -
PROPOSED FTOL TERMINATION DATE (TAC No. 11218)

Consumers Power Company began construction of the Palisades Nuclear Plant on July 18, 1967. On March 24, 1971 Consumers Power Company was granted a low power testing license for the Palisades Plant by the AEC, under the interim hearing provisions then in effect. The "interim" designation was removed upon the issuance of Amendment 3 to Operating License No. DPR-20 on September 1, 1972. On October 16, 1972 the Commission amended the operating license to allow full power operation. In January 1974, Consumers Power Company submitted a request that it be granted a full term operating license (FTOL) for the Palisades Plant.

In its January 1974 request, the Company sought issuance of a full term operating license that, in accordance with the Commission's policy at the time, would expire 40 years from the date of the construction permit issuance. However, the Commission has since determined that the 40 year license term specified as the maximum term by Section 103.c of the Atomic Energy Act of 1954 (42 USC 2133(c)) may commence with the issuance of the operating license. In a number of instances, the Commission has approved requests to amend existing operating licenses to extend their terms beyond the original expiration date. Consumers Power Company requests that the Commission, in issuing the full term operating license requested in January 1974, specify an expiration date that is 40 years from the date of issuance of the operating license, i.e., March 24, 2011.

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SUMMARY

The planned life of the Palisades Plant, as specified and analyzed in the FSAR, was for forty years of commercial service. The siting, original equipment design specifications, fabrication, and plant construction were all based on an assumed useful operating life of forty years. Since the issuance of the provisional operating license (POL), Consumers Power Company has maintained various maintenance and testing programs to ensure plant equipment and

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structures continue to meet the applicable design requirements. In addition to complying with the original regulatory requirements for a plant of its design and vintage, the Palisades Plant has been evaluated under NUREG 0660, NUREG 0737, the Systematic Evaluation Program (SEP), the Equipment Environmental Qualification Program (EEQ), and the Safety System Functional Inspection Program (SSFI). Each of these programs was developed by the NRC to ensure the safe operation of older nuclear power plants. Where these programs have shown that plant equipment or procedures required modification to ensure the health and safety of the public or to meet revised or updated licensing criteria, those modifications have been performed or scheduled. The Palisades Plant is currently participating in the Seismic Qualification Utility Group (SQUG). Implementation of the program developed by SQUG, and approved by the NRC, will ensure that vital plant equipment is capable of withstanding an operating basis earthquake and safely shutting down the plant.

In support of the position that the FTOL should be granted for the full forty-year design life of the Palisades Plant, Consumers Power Company offers the following additional information regarding the environmental impact of plant operation and the design and maintenance of plant equipment.

SUMMARY OF ENVIRONMENTAL IMPACT

The information and analyses presented in the Palisades Plant Final Environmental Statement (FES), dated June, 1972 were based on an assumed plant life of 40 years. The FES has been reviewed to identify any significant changes to the Palisades Plant since the FES was issued that could change the original conclusions of that document. That review shows there have been no changes to the plant, plant facilities, or operation of the Palisades Plant that could cause any significant increase in the environmental impact of plant operation as described in the FES or that would materially change the conclusions presented in the FES.

Description of Plant and Plant Site

The Palisades Plant is located on the eastern shore of Lake Michigan in Covert Township, Van Buren County, Michigan approximately four-and-one-half miles south of the southern city limits of South Haven, Michigan. The site area consists of rolling sand dunes which extend inland about 5,000 feet. The area adjacent to the site is primarily agricultural land and is sparsely populated. The low population zone (LPZ), as defined by 10 CFR 100, extends a distance of 4,820 meters, or 3 miles, from the plant site. The minimum exclusion area distance to an uncontrolled area is 677 meters (2200 feet). The minimum exclusion area and LPZ distances form the bases for the site evaluation in accordance with 10 CFR Part 100 (FSAR Section 2.0). There are approximately 432 acres within the site boundary, all currently owned by Consumers Power Company. Consumers Power Company has sole control of the area within the site boundary for the purpose of excluding personnel or property.

The area within the owner controlled area, minimum exclusion area distance, and the low population zone distances have not changed since the issuance of the FES.

Population Changes

Section 2.1.2 of the Palisades FSAR discusses the population density in and around the Palisades Plant. Table 2.10 of the Palisades FSAR provides current and estimated population density for all counties within a 50-mile radius of the Palisades Plant through the year 2000. A comparison of the FSAR data and the most current census and population growth estimates indicate that the data presented in Table 2.10 of the FSAR accurately estimated population changes to date. Although there are no reliable estimates for the population in the three counties (Berrien, Van Buren, and Allegan) immediately adjacent to the Palisades Plant site for the years between 2000 and 2011, recent population growth and economic trends for southwestern Michigan do not indicate any significant change in population growth trends or to the economic composition of the area.

Offsite Radiation Exposure

The probable offsite radiation exposure received by a member of the general public from the operation of the Palisades Plant was assessed and is documented in the Palisades FSAR and the FES. This assessment was based on an assumed 40-year life for the plant. The FES concluded that the operation of the Palisades Plant will contribute only an extremely small increment to the radiation dose that area residents receive from natural background. The FES also noted: "Since fluctuations of the natural background dose may be expected to exceed the small dose increment contributed by the Plant, this increment will be unmeasurable in itself and will constitute no demonstrable meaningful risk...." To ensure that exposure of members of the general public to radioactive material released by the operation of the Palisades Plant is kept as low as is reasonably achievable, the Plant maintains a radiological environmental monitoring program in compliance with the requirements of Section IV of Appendix I to 10 CFR 50.

Based on the operating history of the Palisades Plant and the conclusions of the FES, the total radiation dose to any member of the general public is not expected to be significantly affected by the continued operation of the Palisades Plant through March 2011.

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1. The transfer of ownership of the Palisades Plant from Consumers Power Company (CPCo) to the Palisades Generating Company (PGC), currently expected in early 1991, will include less than the current 432 acres. However, the property interests transferred will give the PGC control of the minimum exclusion area, and between them the two licensees will control the entire 432 acres.

Onsite Radiation Exposure

All plant employees are exposed to radiation caused by plant operation. The total exposure received by individual employees depends to a great extent upon the work assignment of the employee. To ensure that employee exposure is minimized, the Palisades Plant has implemented an effective ALARA (As Low As Reasonably Achievable) Program. In addition, the plant has instituted administrative limits that require that the exposure received by individual employees remain within the guidelines of 10 CFR Part 20. It is not expected that the term of the FTOL will materially affect employee exposure.

Generation of Radioactive Waste

The amount of radioactive waste that would be generated by the operation of the Palisades Plant was analyzed and discussed in the FES. The FES assumed, based on the experience of similar plants, that the Palisades Plant would generate approximately 10,000 cu ft (283 cu. meters) per year of solid waste over the operating life of the plant. The FES concluded that the impact of routine releases of radioactive materials from the Palisades Plant would be negligible.

In order to minimize the amount of solid radioactive waste requiring offsite disposal, the Palisades Plant has instituted an aggressive waste reduction program. Over the past several years the total amount of solid low-level radioactive waste generated by the Palisades Plant has decreased from 450 cubic meters in 1985 to 197 cubic meters in the first 6 months of 1989. The waste reduction program is expected to result in further decreases in the amount of normal waste generated. The Palisades Plant also is in the design and licensing phase of a project to construct an on-site dry cask spent fuel storage facility which will ensure the plant has sufficient spent fuel storage capacity for the entire term of the license proposed by this letter.

The plant life assumed in the FES was 40 years. Therefore, this request for an expiration date for the FTOL of March 24, 2011 will have no significant impact on the total amount of waste that is generated or released from the plant.²

2. Although the total amount of waste generated by normal plant operations is expected to decrease, the Palisades Plant is in the process of replacing the original steam generators. The effect of this project will be to temporarily increase the total amount of waste generated by the plant. This project has been the subject of previous correspondence to the Commission. That correspondence describes the radiological consequences of the project, the total amount of waste expected to be generated, and the method for the safe disposal of that waste.

NPDES Permit System

The Palisades Plant has been issued NPDES (National Pollutant Discharge Elimination System) Permit No. MI 0001457 by the State of Michigan. This permit was issued on May 31, 1985 for a term not to exceed five years. The permit will be reissued during 1990 for a further five-year period. Since the permit was issued, only minor changes to the plant waste stream, governed by that permit, have occurred. The Michigan Department of Natural Resources has determined that none of these changes was significant enough to require that the permit be amended and reissued. A copy of the permit detailing the parameters monitored and the reporting requirements was forwarded to the Administrator, NRC Region III by Consumers Power Company letter dated August 1, 1985.

ORIGINAL PLANT DESIGN

Containment Building and Other Plant Structures

Plant structures including the containment building, auxiliary building, turbine building and service water building were constructed of reinforced concrete and steel. The service life of these structures is well in excess of forty years. Plant structures were designed in accordance with the design criteria identified in Chapter 5 of the Palisades Plant FSAR. Specific design criteria for the containment building are discussed in Section 5.8. The design criteria for other CP Co Design Class 1 structures are discussed in Section 5.9 of the FSAR.

Assurance that the containment building is capable of performing its safety function is provided by performance of periodic integrated leak rate tests (ILRTs). To provide a realistic appraisal of the integrity of the containment under accident conditions, this periodic leak rate test is performed without preliminary leak detection surveys or preliminary leak repairs. Since this program will continue throughout the lifetime of the plant, assurance is provided that the containment building will continue to meet its original design requirements.

Primary Coolant System

All components of the Primary Coolant System are located within the containment building. The major Primary Coolant System components were designed considering a 40-year service life (see FSAR, Section 4.1). To achieve this, strict quality control assurance standards, as outlined in the Palisades FSAR Sections 4.5.4 and 4.5.5, were followed. Component design also considered environmental protection, adherence to established operating procedures, effects of thermal and mechanical cycling, and irradiation effects on the material.

The design, fabrication, construction, inspection, testing and classification of all reactor coolant system components are in accordance with the ASME Boiler

and Pressure Vessel Code, Section III, 1965 edition, including all addenda through Winter 1965 (ASME B&PV Code, Section III, 1965, W65a), and the Code for Pressure Piping, ASA B31.1, 1955. The codes adhered to and component classifications are listed in Table 4-2 of the Palisades FSAR.

Reactor Vessel

The reactor vessel and top head were designed in accordance with ASME B&PV Code, Section III, Class A, 1965, W65a. The continued integrity of the reactor vessel is demonstrated by compliance with 10 CFR 50.61 and 10 CFR 50 Appendices G and H and the plant technical specifications. The irradiation surveillance program is outlined in the Palisades FSAR Section 4.5.3.

The design of the reactor vessel and reactor internals considered the effects of plant operation at full power with an 80% capacity factor or 32 effective full power years. Since the full power license was issued, the plant has operated for the equivalent of 8 effective full power years. During that time the plant has completed 84 heatup-cooldown cycles. The original plant design anticipated a total of 500 heatup-cooldown cycles. Based on the number of effective full power years completed and the number of effective full power years available between 1990 and the proposed end of the FTOL, the plant, if operated at the originally assumed 80% capacity, will complete approximately 26 effective full power years by the end of the proposed FTOL. This is well within the original design of the Palisades Plant.

The reactor vessel is the only component of the Primary Coolant System which is exposed to a significant level of neutron irradiation. Based on the requirements of 10 CFR 50.61 and Regulatory Guide 1.99, Consumers Power Company has determined that the Palisades reactor vessel could exceed the Pressurized Thermal Shock (PTS) screening criteria in early 2002. Therefore, flux reduction measures are being incorporated in the Cycle 9 fuel loading pattern.

Consumers Power Company will continue to monitor the neutron fluence received by the Palisades reactor vessel and will take whatever measures necessary, greater flux reduction, Regulatory Guide 1.154 analysis, etc., to ensure that the Palisades Plant will continue to operate safely.

Mechanical Equipment

All safety-related mechanical equipment identified in Regulatory Guide 1.26, Revision 3 (1976), was designed to ASME B&PV Code sections III and VIII, 1965. The initial design and construction of safety related mechanical equipment assumed a nominal 40 year operating life for that equipment. Subsequently, that equipment has been inspected and tested in accordance with the Inservice Inspection and Testing Program described in Section 4.5.6 and Section 6.9 of the Palisades FSAR.

The Inservice Inspection and Testing Program in conjunction with the Technical Specification Surveillance and Preventative Maintenance Programs ensure that all safety-related mechanical equipment will continue to perform their design function for the design life of the plant.

Electrical Equipment

Safety-related electrical equipment at the Palisades Plant has been reviewed in accordance with the requirements of 10 CFR 50.49, "Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants". A report entitled, "Environmental Qualification of Safety Related Electrical Equipment - Palisades Plant" was submitted to the NRC on September 1, 1980. On April 25, 1983, the NRC issued the Safety Evaluation Report (SER) for the Palisades Electrical Equipment Qualification (EEQ) program. The SER contained a Technical Evaluation Report prepared by the Franklin Research Institute. These reports document the life expectancy of safety related electrical equipment, in most cases 40 years, and identified the most severe environmental operating conditions that equipment is likely to be subjected to. A final SER, dated January 31, 1985, prepared by the NRC Staff stated that the Palisades Plant EEQ program is in compliance with 10 CFR 50.49. The initial design codes used for safety-related electrical equipment are described in Tables 5.2-4 and 5.2-5 of the Palisades FSAR.

The EEQ program in conjunction with the Inspection, Surveillance and Maintenance Programs required by Plant Technical Specifications ensure that safety-related electrical equipment will continue to perform their design function for the design life of the plant.

CONCLUSION

The impacts on the environment described in the Final Environmental Statement assumed a forty-year operational life for the Palisades Plant. The original design of the Plant and its equipment also assumed a forty-year operational life. The combination of original plant design, Inservice Inspection, preventative maintenance, and Technical Specification required operational surveillance programs all combine to ensure that plant equipment will continue to meet its operational and safety requirements for the design life of the plant. Consumers Power Company believes that the requested license extension is consistent with Section 103.c of the Atomic Energy Act of 1954 and with 10 CFR 50.51 of the Commission's rules and regulations. Based on the information presented, Consumers Power Company has shown that the Palisades Plant can be safely and reliably operated for the entire 40-year term of the proposed FTOL, subject to the satisfactory resolution of future safety concerns.

Therefore, Consumers Power Company requests that the expiration date of the Full Term Operating License for the Palisades Plant be March 24, 2011.

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