



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

February 20, 1987

Docket No. 50-341

Mr. B. Ralph Sylvia
Group Vice President
Detroit Edison Company
6400 North Dixie Highway
Newport, Michigan 48166

Dear Mr. Sylvia:

Subject: Issuance of Amendment No. 6 to Facility Operating License
No. NPF-43, Fermi-2

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 6 to Facility Operating License No. NPF-43 for the Fermi-2 facility. This amendment is in response to your letter dated June 27, 1986.

The amendment revises the Fermi-2 Technical Specifications to delete requirements deemed unnecessarily restrictive by the Commission in Generic Letter 85-19 (September 27, 1985) for reporting exceedances in primary reactor system coolant activity limits (e.g. Iodine-131 activity limits).

A copy of the related safety evaluation supporting Amendment No. 6 to Facility Operating License No. NPF-43 is enclosed.

Sincerely,

A handwritten signature in cursive script that reads "Elinor G. Adensam".

Elinor G. Adensam, Director
BWR Project Directorate No. 3
Division of BWR Licensing

Enclosures:

1. Amendment No. 6 to NPF-43
2. Safety Evaluation

cc w/enclosure:
See next page

DESIGNATED ORIGINAL

Certified by

A handwritten signature in cursive script, possibly "J. J.", followed by a horizontal line and a small rectangular stamp.

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Mr. B. Ralph Sylvia
Detroit Edison Company

Fermi-2 Facility

cc:

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

DETROIT EDISON COMPANY

WOLVERINE POWER SUPPLY COOPERATIVE, INCORPORATED

DOCKET NO. 50-341

FERMI-2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 6
License No. NPF-43

1. The Nuclear Regulatory Commission (the Commission or the NRC) has found that:
 - A. The application for amendment filed by the Detroit Edison Company (DECo), dated June 27, 1986, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the regulations of the Commission;
 - C. There is reasonable assurance: (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the enclosure to this license amendment; and paragraph 2.C.(2) of the Facility Operating License No. NPF-43 is hereby amended to read as follows:

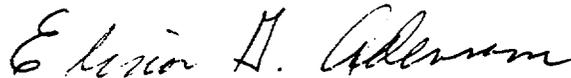
(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 6, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. DECo shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

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3. This amendment is effective as of date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Elinor G. Adensam, Director
BWR Project Directorate No. 3
Division of BWR Licensing

Enclosure:
Changes to the Technical
Specifications

Date of Issuance: February 20, 1987

ENCLOSURE TO LICENSE AMENDMENT NO. 6

FACILITY OPERATING LICENSE NO. NPF-43

DOCKET NO. 50-341

Replace the following pages of the Appendix A Technical Specifications with the enclosed pages. The revised pages are identified by Amendment number and contain a vertical line indicating the area of change. The corresponding overleaf pages are also provided to maintain document completeness.

REMOVE

3/4 4-15
3/4 4-16

3/4 4-17
3/4 4-18

B3/4 4-3
B3/4 4-4

6-15
6-16

INSERT

3/4 4-15 (overleaf page)
3/4 4-16

3/4 4-17
3/4 4-18 (overleaf page)

B3/4 4-3
B3/4 4-4 (overleaf page)

6-15 (overleaf page)
6-16

6-16a (pagination change only)

TABLE 3.4.4-1
REACTOR COOLANT SYSTEM
CHEMISTRY LIMITS

<u>OPERATIONAL CONDITION</u>	<u>CHLORIDES</u>	<u>CONDUCTIVITY ($\mu\text{mhos/cm @25}^\circ\text{C}$)</u>	<u>pH</u>
1	≤ 0.2 ppm	≤ 1.0	$5.6 \leq \text{pH} \leq 8.6$
2 and 3	≤ 0.1 ppm	≤ 2.0	$5.6 \leq \text{pH} \leq 8.6$
At all other times	≤ 0.5 ppm	≤ 10.0	$5.3 \leq \text{pH} \leq 8.6$

REACTOR COOLANT SYSTEM

3/4.4.5 SPECIFIC ACTIVITY

LIMITING CONDITION FOR OPERATION

3.4.5 The specific activity of the primary coolant shall be limited to:

- a. Less than or equal to 0.2 microcuries per gram DOSE EQUIVALENT I-131, and
- b. Less than or equal to $100/\bar{E}$ microcuries per gram.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, 3, and 4.

ACTION:

- a. In OPERATIONAL CONDITION 1, 2, or 3 with the specific activity of the primary coolant;
 1. Greater than 0.2 microcuries per gram DOSE EQUIVALENT I-131 but less than or equal to 4.0 microcuries per gram DOSE EQUIVALENT I-131 for more than 48 hours during one continuous time interval, or greater than 4.0 microcuries per gram DOSE EQUIVALENT I-131, be in at least HOT SHUTDOWN with the main steam line isolation valves closed within 12 hours.
 2. Greater than $100/\bar{E}$ microcuries per gram, be in at least HOT SHUTDOWN with the main steam line isolation valves closed within 12 hours.
- b. In OPERATIONAL CONDITION 1, 2, 3, or 4, with the specific activity of the primary coolant greater than 0.2 microcuries per gram DOSE EQUIVALENT I-131 or greater than $100/\bar{E}$ microcuries per gram, perform the sampling and analysis requirements of Item 4.a of Table 4.4.5-1 until the specific activity of the primary coolant is restored to within its limit.

REACTOR COOLANT SYSTEM

LIMITING CONDITION FOR OPERATION (Continued)

ACTION: (Continued)

- c. In OPERATIONAL CONDITION 1 or 2, with:
1. THERMAL POWER changed by more than 15% of RATED THERMAL POWER in 1 hour*, or
 2. The off-gas level, at the delay pipe, increased by more than 10,000 microcuries per second in 1 hour during steady-state operation at release rates less than 75,000 microcuries per second, or
 3. The off-gas level, at the delay pipe, increased by more than 15% in one hour during steady-state operation at release rates greater than 75,000 microcuries per second,
- perform the sampling and analysis requirements of Item 4b of Table 4.4.5-1 until the specific activity of the primary coolant is restored to within its limit.

SURVEILLANCE REQUIREMENTS

4.4.5 The specific activity of the reactor coolant shall be demonstrated to be within the limits by performance of the sampling and analysis program of Table 4.4.5-1.

*Not applicable during the startup test program.

TABLE 4.4.5-1
PRIMARY COOLANT SPECIFIC ACTIVITY SAMPLE AND ANALYSIS PROGRAM

<u>TYPE OF MEASUREMENT AND ANALYSIS</u>	<u>SAMPLE AND ANALYSIS FREQUENCY</u>	<u>OPERATIONAL CONDITIONS IN WHICH SAMPLE AND ANALYSIS REQUIRED</u>
1. Gross Beta and Gamma Activity Determination	At least once per 72 hours	1, 2, 3
2. Isotopic Analysis for DOSE EQUIVALENT I-131 Concentration	At least once per 31 days	1
3. Radiochemical for \bar{E} Determination	At least once per 6 months*	1
4. Isotopic Analysis for Iodine	a) At least once per 4 hours, whenever the specific activity exceeds a limit, as required by ACTION b.	1**, 2**, 3**, 4**
	b) At least one sample, between 2 and 6 hours following the change in THERMAL POWER or off-gas level, as required by ACTION c.	1, 2
5. Isotopic Analysis of an Off-gas Sample Including Quantitative Measurements for at least Xe-133, Xe-135 and Kr-88	At least once per 31 days	1

*Sample to be taken after a minimum of 2 EFPD and 20 days of POWER OPERATION have elapsed since reactor was last subcritical for 48 hours or longer.

**Until the specific activity of the primary coolant system is restored to within its limits.

REACTOR COOLANT SYSTEM

BASES

3/4.4.5 SPECIFIC ACTIVITY

The limitations on the specific activity of the primary coolant ensure that the 2 hour thyroid and whole body doses resulting from a main steam line failure outside the containment during steady state operation will not exceed small fractions of the dose guidelines of 10 CFR 100. The values for the limits on specific activity represent interim limits based upon a parametric evaluation by the NRC of typical site locations. These values are conservative in that specific site parameters, such as site boundary location and meteorological conditions, were not considered in this evaluation.

The ACTION statement permitting POWER OPERATION to continue for limited time periods with the primary coolant's specific activity greater than 0.2 microcuries per gram DOSE EQUIVALENT I-131, but less than or equal to 4.0 microcuries per gram DOSE EQUIVALENT I-131, accommodates possible iodine spiking phenomenon which may occur following changes in THERMAL POWER. In accordance with Generic Letter 85-19, the results of specific activity analyses in which primary coolant exceeds the limits of Specification 3.4.5 will be included in the Annual Report (Specification 6.9.1.5.d).

Information obtained on iodine spiking will be used to assess the parameters associated with spiking phenomena. A reduction in frequency of isotopic analysis following power changes may be permissible if justified by the data obtained.

Closing the main steam line isolation valves prevents the release of activity to the environs should a steam line rupture occur outside containment. The surveillance requirements provide adequate assurance that excessive specific activity levels in the reactor coolant will be detected in sufficient time to take corrective action.

REACTOR COOLANT SYSTEM

BASES

3/4.4.6 PRESSURE/TEMPERATURE LIMITS

All components in the reactor coolant system are designed to withstand the effects of cyclic loads due to system temperature and pressure changes. These cyclic loads are introduced by normal load transients, reactor trips, and startup and shutdown operations. The various categories of load cycles used for design purposes are provided in Section 5.2 of the FSAR. During startup and shutdown, the rates of temperature and pressure changes are limited so that the maximum specified heatup and cooldown rates are consistent with the design assumptions and satisfy the stress limits for cyclic operation.

During heatup, the thermal gradients in the reactor vessel wall produce thermal stresses which vary from compressive at the inner wall to tensile at the outer wall. These thermal induced compressive stresses tend to alleviate the tensile stresses induced by the internal pressure. Therefore, a pressure-temperature curve based on steady state conditions, i.e., no thermal stresses, represents a lower bound of all similar curves for finite heatup rates when the inner wall of the vessel is treated as the governing location.

The heatup analysis also covers the determination of pressure-temperature limitations for the case in which the outer wall of the vessel becomes the controlling location. The thermal gradients established during heatup produce tensile stresses which are already present. The thermal induced stresses at the outer wall of the vessel are tensile and are dependent on both the rate of heatup and the time along the heatup ramp; therefore, a lower bound curve similar to that described for the heatup of the inner wall cannot be defined. Subsequently, for the cases in which the outer wall of the vessel becomes the stress controlling location, each heatup rate of interest must be analyzed on an individual basis.

The reactor vessel materials have been tested to determine their initial RT_{NDT} . The results of these tests are shown in Table B 3/4.4.6-1. Reactor operation and resultant fast neutron, E greater than 1 MeV, irradiation will cause an increase in the RT_{NDT} . Therefore, an adjusted reference temperature, based upon the fluence, phosphorus content and copper content of the material in question, can be predicted using Bases Figure B 3/4.4.6-1 and the recommendations of Regulatory Guide 1.99, Revision 1, "Effects of Residual Elements on Predicted Radiation Damage to Reactor Vessel Materials." The pressure/temperature limit curve, Figure 3.4.6.1-1, curves A', B' and C', includes predicted adjustments for this shift in RT_{NDT} for the end of life fluence.

The actual shift in RT_{NDT} of the vessel material will be established periodically during operation by removing and evaluating, in accordance with ASTM E185-73 and 10 CFR 50, Appendix H, irradiated reactor vessel material specimens installed near the inside wall of the reactor vessel in the core area. Since the neutron spectra at the material specimens and vessel inside radius are essentially identical, the irradiated specimens can be used with confidence in predicting reactor vessel material transition temperature shift. The operating limit curves of Figure 3.4.6.1-1 shall be adjusted, as required, on the basis of the specimen data and recommendations of Regulatory Guide 1.99, Revision 1.

ADMINISTRATIVE CONTROLS

PROCEDURES AND PROGRAMS (Continued)

The program shall include the following:

1. Training of personnel,
 2. Procedures for sampling and analysis, and
 3. Provisions for maintenance of sampling and analysis equipment.
- d. High Density Spent Fuel Racks

A program which will assure that any unanticipated degradation of the high density spent fuel racks will be detected and will not compromise the integrity of the racks.

6.9 REPORTING REQUIREMENTS

ROUTINE REPORTS

6.9.1 In addition to the applicable reporting requirements of Title 10, Code of Federal Regulations, the following reports shall be submitted to the Regional Administrator of the Regional Office of the NRC unless otherwise noted.

STARTUP REPORT

6.9.1.1 A summary report of plant startup and power escalation testing shall be submitted following (1) receipt of an Operating License, (2) amendment to the license involving a planned increase in power level, (3) installation of fuel that has a different design or has been manufactured by a different fuel supplier, and (4) modifications that may have significantly altered the nuclear, thermal, or hydraulic performance of the unit.

6.9.1.2 The startup report shall address each of the tests identified in Subsection 14.1.4.8 of the Final Safety Analysis Report and shall include a description of the measured values of the operating conditions or characteristics obtained during the test program and a comparison of these values with design predictions and specifications. Any corrective actions that were required to obtain satisfactory operation shall also be described. Any additional specific details required in license conditions based on other commitments shall be included in this report.

6.9.1.3 Startup reports shall be submitted within (1) 90 days following completion of the startup test program, (2) 90 days following resumption or commencement of commercial power operation, or (3) 9 months following initial criticality, whichever is earliest. If the startup report does not cover all three events (i.e., initial criticality, completion of startup test program, and resumption or commencement of commercial operation) supplementary reports shall be submitted at least every 3 months until all three events have been completed.

ANNUAL REPORTS

6.9.1.4 Annual reports covering the activities of the unit as described below for the previous calendar year shall be submitted prior to March 1 of each year. The initial report shall be submitted prior to March 1 of the year following initial criticality.

ADMINISTRATIVE CONTROLS

ANNUAL REPORTS (Continued)

6.9.1.5 Reports required on an annual basis shall include:

- a. A tabulation on an annual basis of the number of plant, utility, and other personnel (including contractors) receiving exposures greater than 100 mrems/yr and their associated man-rem exposure according to work and job functions,* (e.g., reactor operations and surveillance, inservice inspection, routine maintenance, special maintenance [describe maintenance], waste processing, and refueling). The dose assignments to various duty functions may be estimated based on pocket or thermoluminescent dosimeters (TLD) dosimeters or film badge measurements. Small exposures totalling less than 20% of the individual total dose need not be accounted for. In the aggregate, at least 80% of the total whole-body dose received from external sources should be assigned to specific major work functions; and
- b. Documentation of all challenges to main steam line safety/relief valves, and
- c. A summary of ECCS outage data including:
 1. ECCS outage dates and duration of outages,
 2. Cause of each ECCS outage,
 3. ECCS systems and components in the outage, and
 4. Corrective action taken.
- d. The reports shall also include the results of specific activity analysis in which the primary coolant exceeded the limits of Specification 3.4.5. The following information shall be included:
 - (1) reactor power history starting 48 hours prior to the first sample in which the limit was exceeded;
 - (2) results of the last isotopic analysis for radioiodine performed prior to exceeding the limit, results of analysis while limit was exceeded and results of one analysis after the radioiodine activity was reduced to less than limit (each result should include date and time of sampling and the radioiodine concentrations);
 - (3) clean-up system flow history starting 48 hours prior to the first sample in which the limit was exceeded;
 - (4) graph of the I-131 and one other radioiodine isotope concentrations in microcuries per gram as a function of time for the duration of the specific activity above the steady-state level; and
 - (5) the time duration when the specific activity of the primary coolant exceeded the radioiodine limit.

*This tabulation supplements the requirements of §20.407 of 10 CFR Part 20.

ADMINISTRATIVE CONTROLS

MONTHLY OPERATING REPORTS

6.9.1.6 Routine reports of operating statistics and shutdown experience shall be submitted on a monthly basis to the Director, Office of Resource Management, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, with a copy to the Regional Administrator of the Regional Office of the NRC, no later than the 15th of each month following the calendar month covered by the report.

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

6.9.1.7 Routine Annual Radiological Environmental Operating Reports covering the operation of the unit during the previous calendar year shall be submitted prior to May 1 of each year. The initial report shall be submitted prior to May 1 of the year following initial criticality.

The Annual Radiological Environmental Operating Reports shall include summaries, interpretations, and an analysis of trends of the results of the radiological environmental surveillance activities for the report period, including a comparison as appropriate, with preoperational studies, with operational controls, and with previous environmental surveillance reports, and an assessment of the observed impacts of the plant operation on the environment. The reports shall also include the results of land use censuses required by Specification 3.12.2. The Annual Radiological Environmental Operating Reports shall include the results of analysis of all radiological environmental samples and of all environmental



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
SUPPORTING AMENDMENT NO. 6 TO FACILITY OPERATING LICENSE NO. NPF-43

DETROIT EDISON COMPANY

WOLVERINE POWER SUPPLY COOPERATIVE, INCORPORATED

FERMI-2

DOCKET NO. 50-341

1.0 INTRODUCTION

By letter dated June 27, 1986, Detroit Edison Company (the licensee) requested a change to the Fermi-2 Technical Specifications to modify reporting requirements for iodine spiking. The change replaces the requirement for a short-term report with a requirement that an item discussing iodine spiking be included in the Annual Report. Additionally, the request would eliminate the existing requirements to shutdown the plant if coolant iodine activity limits are exceeded for 800 hours in a 12 month period.

2.0 EVALUATION

The Technical Specifications for Fermi-2 currently require that the licensee report any iodine spiking events to the NRC within 30 days. Furthermore, plant shutdown is required if, within any 12 month period, cumulative operating time with an iodine activity level above 0.2 uCi/gm reaches 800 hours.

Generic Letter No. 85-19 "Reporting Requirements on Primary Coolant Iodine Spikes" provides relaxation of the above requirements to the effect that the reporting requirements for the iodine spiking can be reduced from a short-term report (within 30 days) to an item which is to be included in the Annual Report. Additionally, the Generic Letter No. 85-19 states that the existing requirements to shutdown a plant if iodine activity limits are exceeded for 800 hours in a 12 month period can be eliminated.

The licensee's request for a revision of Fermi-2 Technical Specifications Section 3.4.5, Bases 3/4.4-5 and Administrative Controls Section 6.9.1.5 is acceptable, because the proposed changes are consistent with the staff position and with the guidance described in the model Technical Specifications contained in the Generic Letter No. 85-19.

3.0 ENVIRONMENTAL CONSIDERATION

This amendment involves a change in the use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes in surveillance and reporting requirements. The staff has determined that this amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents which may be released offsite, and

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that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) and (c)(10). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

4.0 CONCLUSION

The Commission made a proposed determination that the amendment involves no significant hazards consideration which was published in the FEDERAL REGISTER (51 FR 45198) on December 17, 1986, and consulted with the state of Michigan. No public comments were received, and the state of Michigan did not have any comments.

We have 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.

Principal Contributor: G. Thomas, NRR

Dated: February 20, 1987

AMENDMENT NO. 6 TO FACILITY OPERATING LICENSE NO. NPF-43 - FERMI, UNIT 2

DISTRIBUTION:

Docket No. 50-341
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