May 14, 1999  
NRC-99-0039

U. S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington D. C. 20555-0001

References:  1) Fermi 2  
NRC Docket No. 50-341  
NRC License No. NPF-43  

2) NRC Letter to Detroit Edison, "Request for Additional Information - Regarding the Proposed Relief Request Update for the First Ten-Year ISI NDE Program", (TAC No. 1570), dated May 28, 1998  


Subject: Resubmittal of Relief Request RR-A23 - ASME Class 1 Pipe Welds  

Requests for relief from the American Society of Mechanical Engineers (ASME) Code, Section XI requirements for the First Ten-Year Interval, Inservice Inspection (ISI) Nondestructive Examination (NDE) Program along with additional information requested in Reference 2 were submitted to the NRC in Reference 3.

Subsequent discussions with NRC personnel indicated there were additional questions pertaining to examinations of two main steam system circumferential pipe welds and the intersecting longitudinal seams that were limited by whip restraints. Specifically, what type modification to the whip restraint assembly would be necessary to allow...
full examination. Detroit Edison indicated that this would be researched during Refueling and Inspection Outage 6 (RF06) and RR-A23 would be resubmitted. These nonessential whip restraints were permanently removed during the outage and the inspections were completed. These welds were removed from the relief request.

The enclosure of this letter provides resubmittal of the relief request. Pursuant to 10 CFR 50.55a(g)(5)(iii) Detroit Edison is requesting relief from the ASME Section XI requirement to examine essentially 100% of selected Category B-J pipe welds, because within the limits of design and accessibility it is impractical to do so.

Detroit Edison will incorporate this Relief Request into the ISI NDE Program upon receipt of your approval.

Should you have any questions or require additional information, please contact Mr. Norman K. Peterson of my staff at (734) 586-4258.

Sincerely,

Enclosure

cc: A. J. Kugler
A. Vegel
NRC Resident Office
Regional Administrator, Region III
Supervisor, Electric Operators,
Michigan Public Service Commission
ENCLOSURE TO
NRC-99-0039

FERMI 2 NRC DOCKET NO. 50-341
NRC LICENSE NO. NPF-43

RELIEF REQUEST
RR-A23
RELIEF REQUEST
RR-A23

COMPONENT FUNCTION/DESCRIPTION:
Pressure Retaining Piping Welds (see attached Table for identification numbers)

SYSTEMS:
Reactor Recirculation (B31)
Residual Heat Removal (E11)
Feedwater (N21)

ASME CODE CLASS:
Class 1

ASME SECTION XI REQUIREMENTS:
ASME Section XI, 1980 Edition including the Winter 1981 Addenda, Subsection IWB, Table IWB-2500-1, Category B-J, item 9.11 requires a volumetric and surface examination of circumferential piping welds greater than or equal to 4' diameter. Note 3 of Table IWB-2500-1 requires that the examination include essentially 100% of the weld length and volume specified in figure IWB-2500-8.

BASIS FOR RELIEF:
During the course of inservice examination, 4 of 156 Category B-J circumferential welds have been encountered that are impractical to fully examine in accordance with ASME Section XI (> 90% of length and volume). Pursuant to 10 CFR 50.55a(g)(5)(iii) Detroit Edison is requesting relief from ASME Section XI requirements to perform complete examinations of listed piping welds, as described above.

Fermi proposes to examine these welds to the extent practical within the limits of design and accessibility. Reasonable assurance of piping system structural integrity is provided by the Fermi ISI NDE Program as detailed in this relief request. Detroit Edison considers the proposed alternative examination to provide an acceptable level of quality and safety.

The adjacent weld, which is also a moderate stress weld, is fully examined. Inspections completed through the sixth refueling outage (RF06) have detected no reportable service induced defects in any carbon steel piping welds subject to ISI.
ALTERNATIVE EXAMINATION:

Partial examination of each weld to the greatest extent possible using appropriate surface and ultrasonic examination methods. Additionally, leakage inspections performed at the completion of each refueling outage per Category B-P include all of these welds.

The extent of partial examination and technical justification for each is provided below:

<table>
<thead>
<tr>
<th>Reactor Recirculation (B31)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Category /Item</strong></td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td>B-J/B9.11</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

This stainless steel weld is a low stress random selection. The weld was given an IGSCC mitigation treatment (Induction Heat Stress Improvement) as defined in NUREG 0313 Rev. 2, prior to service. Fermi has also implemented an augmented inspection program in accordance with Generic Letter 88-01. The combined Code and GL-88-01 selections result in greater than 50% of all Reactor Recirculation System welds being inspected each interval. The inspection sample set is sufficiently large to provide for reliable detection of representative degradation. There is no decrease in the ability to detect system degradation as a result of this limitation. Redesigning or removing the obstructions to marginally increase coverage of this weld is impractical. It would also substantially increase man-hours and radiation dose without a compensating increase in plant safety. Detroit Edison believes this alternative provides an acceptable level of quality and safety.

<table>
<thead>
<tr>
<th>RHR (E11)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Category /Item</strong></td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>B-J/B9.11</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

This stainless steel tee-to-pipe weld is a high stress weld selection. The weld was radiographed during construction and satisfied Section III acceptance criteria. There are also six other high stress locations in the RHR system that were fully examined. The surface of the weld is fully
accessible for liquid penetrant examination. Ultrasonic examination is limited to effective scanning from the pipe side only because of reducing-tee configuration. The ultrasonic examination covers all of the base material on the pipe side of the weld and the weld root area. Because the examination covers the weld root area, which is also the thinnest section of this pipe-to-tee weld zone, there is adequate assurance that IGSCC or fatigue or cracking could be detected. Altering the weld design to increase exam coverage would be impractical. Additionally, two adjacent welds on both sides of this weld are fully examined. Fermi has also implemented an augmented inspection program in accordance with Generic Letter 88-01. The combined Code and Generic Letter 88-01 selections result in greater than 50% of all susceptible welds being inspected each interval. The inspection sample set is sufficiently large to provide for reliable detection of representative degradation. There is no decrease in the ability to detect system degradation as a result of this limitation.

Radiographic examination was considered as an alternative but has the following limitations. The radiation emitted from the pipe would negatively impact the sensitivity of the examination. Performance of the examination would take approximately one shift to complete and prevent other outage activities from being performed during the radiography evolution. Radiographic examination of the weld would require draining of the recirculation loop piping and a portion of RHR. This would require plugging jet-pumps and recirc suction lines inside the vessel. RHR Shutdown cooling would not be available to remove decay heat. For these reasons radiography is not a feasible alternative for the ultrasonic examination.

Because of the acceptable initial condition, pressure test history and continued performance, the capability to complete the surface exam and greater than 50 percent of the exam volume including the root area, it is reasonable to conclude there is no significant impact on the level of plant quality and safety by the reduction in volumetric coverage of this weld. Detroit Edison believes this alternative provides an acceptable level of quality and safety.

### Feedwater (N21)

<table>
<thead>
<tr>
<th>Category / Item</th>
<th>Weld Identification</th>
<th>Percentage Complete</th>
<th>Limitation Description</th>
<th>Alternative Examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-J/B9.11</td>
<td>FW-N21-2336-0W1</td>
<td>~76% UT 100% MT</td>
<td>Tee to Valve Configuration</td>
<td>Examine accessible area</td>
</tr>
</tbody>
</table>

This carbon steel tee-to-pipe weld is a moderate stress weld selection category as defined in the Fermi UFSAR. The moderate stress category results in an inspection sample of 28% of all Category B9.11 circumferential welds. The increased inspection sample is comprised of welds with the highest probability of failure and results in added assurance of system integrity. This is a more conservative approach to selecting welds than a supplemental random selection to bring the examination sample to 25%, as specified in the Code. The inspection sample set exceeds
ASME Code requirements and is sufficiently large to provide for reliable detection of system degradation.

The weld was radiographed during construction and satisfied Section III acceptance criteria. The valve body and weld ends were also radiographed in accordance with NB 2570. The surface of the weld is fully accessible for magnetic particle examination. Ultrasonic examination is limited because of tee-to-valve configuration. The ultrasonic examination does cover the weld and the weld root area in at least one direction base material on the valve side is not fully covered in two directions. Altering the weld design to marginally increase coverage is impractical.

Because of the acceptable initial condition, pressure test history and continued performance, the capability to complete the surface exam and approximately 75% of the exam volume including the root area, it is reasonable to conclude there is no significant impact on the level of plant quality and safety by the reduction in volumetric coverage of this weld. Because the inspection sample population exceeds ASME Code requirements, there is no decrease in the ability to detect system degradation as a result of this limitation. Detroit Edison believes this alternative provides an acceptable level of quality and safety.

### Feedwater (N21)

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</tr>
</thead>
<tbody>
<tr>
<td>B-J/B9.11</td>
<td>FW-N21-2336-1W03</td>
<td>50% UT</td>
<td>Sweeplet to Valve</td>
<td>Examine</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100% MT</td>
<td>Configuration</td>
<td>accessible area</td>
</tr>
</tbody>
</table>

This carbon steel reducer-to-valve weld is a high stress weld selection. The weld was radiographed during construction and satisfied Section III acceptance criteria. The valve body and weld ends were also radiographed in accordance with NB 2570. There are also eleven other high stress locations (includes terminal ends) in the Feedwater System that will be fully examined. The surface of the weld is fully accessible for magnetic particle examination. Ultrasonic examination is limited to effective scanning from the crown of the weld. The ultrasonic examination covers most of the base material on both sides of the weld in one direction. The entire weld and root was scanned in the circumferential direction. Additionally, the high stress weld directly adjacent to this weld was fully examined.

There are over 50 high stress carbon steel weld selections spread among the systems subject to inservice inspection. The Fermi Class 1 inspection population for all systems exceeds ASME Code requirements by 15 welds because moderate stress welds are included in the selection basis. The welds that were selected are the most probable locations for stress related failure. The selection methodology used was more stringent than required by Code. Because of the selection methodology and sample size there is no reduction in capability to detect system degradation as
compared to Code requirements. Through the sixth refueling outage (RF06) there were no service induced defects detected. Industry experience does not indicate cracking of carbon steel butt welds to be a problem. All of these reasons indicate that it is impractical to alter the weld design to increase exam coverage for this weld.

Radiographic examination was considered as an alternative but is undesirable for the following reasons. Draining the feedwater line to perform the examination would make reactor water clean up unavailable and would negatively impact reactor vessel clarity potentially affecting refueling and inspection activities. It would also prevent drywell and steam tunnel outage activities from be performed during the radiography evolution adding critical path time to the outage schedule. The benefit of increasing the coverage of this weld by radiographic examination has only a small potential of increasing plant safety margin and a disproportionate impact on other plant activities. Because of these impacts and since the Fermi inspection program exceeds ASME Code requirements for the sampling program this alternative is not considered to be practical.

Because of the acceptable initial condition, pressure test history and continued performance, the capability to complete the surface exam and approximately 50 percent of the Code exam volume, it is reasonable to conclude there is no significant impact on the level of plant quality and safety by the reduction in volumetric coverage of this weld. Detroit Edison believes this alternative provides an acceptable level of quality and safety.

APPLICABLE TIME PERIOD:

Relief is requested for the first 10-year inspection interval.