

Detroit  
Edison

• Douglas R. Gipson  
• Senior Vice President  
• Nuclear Generation

Fermi 2  
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(313) 586-5249

May 24, 1993  
NRC-93-0064

U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, D. C. 20555

- References:
- 1) Fermi 2  
NRC Docket No. 50341  
NRC License No. NPF-43
  - 2) Detroit Edison letter to NRC, "Report of Reactor Containment Building Integrated Leak Rate Test," NRC-90-0022 dated February 21, 1990
  - 3) Detroit Edison letter to NRC, "Report of Reactor Containment Building Integrated Leak Rate Test," NRC-93-0002 dated January 26, 1993
  - 4) IE Information Notice NO. 85-71, "Containment Integrated Leak Rate Test," dated August 22, 1985
  - 5) A. B. Wang letter to J. F. Opeka, "Haddam Neck Plant--Exemption to 10CFR Part 50, Appendix J (TAC No. M81269)," dated December 5, 1991

Subject: 10 CFR Part 50, Appendix J, Paragraph III.A.6(b)  
and Fermi 2 Technical Specification Surveillance  
Requirement 4.6.1.2 Request for Exemption from  
Schedular Requirements

Pursuant to 10CFR50.12, Detroit Edison Company (DECO) hereby submits a request for a one-time exemption from 10CFR50, Appendix J, Paragraph III.A.6(b) and Fermi 2 Technical Specification Surveillance Requirement 4.6.1.2, which requires, in part, that "if two consecutive periodic Type A tests fail to meet the applicable acceptance criteria in III.A.5(b), a Type A test shall be performed at each plant shutdown for refueling or approximately 18 months, whichever occurs first, until two consecutive Type A tests meet the acceptance criteria in III.A.5(b), after which time the retest schedule specified in III.D may be resumed."

Fermi 2 experienced failures of the "As-Found" Type A tests in 1989 and 1992. The results of the 1989 and 1992 Type A tests were provided to the Staff in letters dated February 21, 1990 (Reference 2) and

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January 26, 1993 (Reference 3) respectively. In both instances, Type C local leakage rates were the reason for the "As-Found" failures. Due to the failure of two consecutive periodic Type A tests, Fermi 2 is subject to the increased Type A test frequency requirements of both 10CFR50, Appendix J and Fermi 2 Technical Specifications. These accelerated testing requirements state that Type A tests be performed at approximately 18-month intervals.

The last failed Integrated Leak Rate Test (ILRT) was performed on October 28, 1992; therefore, a Type A test is currently required to be performed at the next Refueling Outage, RF-04, presently scheduled to begin in March of 1994. Performance of the Type A Test in RF-04 after the performance of Local Leak Rate Testing, would result in a significant increase in occupational radiation exposure, in addition to consuming significant resources and vital outage time, with no contribution towards ensuring the health and safety of the public. Therefore, the subject exemption is being requested to gain relief from the accelerated testing requirements of 10CFR50, Appendix J, Paragraph III.A.6(b) and Fermi 2 Technical Specification Surveillance Requirement 4.6.1.2. Details of our exemption request are contained in Attachment 1.

The guidance of NRC Information Notice (IN) No. 85-71 (Reference 4) is being followed in the submittal of this exemption request. Information Notice No. 85-71 states that "if Type B and C leakage rates constitute an identified contributor to this failure of the 'as-found' condition for the ILRT, the general purpose of maintaining a high degree of containment integrity might be better served through an improved maintenance and testing program for containment penetration boundaries and isolation valves. In this situation the licensee may submit a Corrective Action Plan with an alternative leakage test program proposal as an exemption request for NRC staff review." If this submittal is approved, the licensee is allowed to implement the corrective actions in lieu of the required increase in Type A test frequency.

The specifics of the Fermi 2 Corrective Action Plan (CAP) are discussed in Attachment 2. Based on the discussions in Attachment 2, DECO requests NRC approval of our CAP and resumption of the normal test schedule specified in Section III.D of Appendix J, which requires the performance of three Type A tests during each ten-year period.

The NRC has granted a similar exemption to the Connecticut Yankee Atomic Power Company's Haddam Neck Plant from performing accelerated Type A testing as documented in a letter dated December 5, 1991 (Reference 5). The requested exemption would enable Fermi 2 to maintain the normal leak rate testing frequency consistent with the special circumstances which support the approval of this exemption. Similar circumstances have been formally recognized as a sufficient basis for such an exemption by the NRC. Consistent with the guidance

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in the Information Notice, the NRC has granted exemptions under these circumstances at other plants such as Palisades, Duane Arnold, and Sequoyah Unit No. 2, thereby avoiding both unnecessary occupational radiation exposures and diversion of resources.

This exemption request addresses: (1) failure of the 1989 and 1992 "As-Found" LLRTs which has been verified to have resulted only from the contributions of local leak failures from Types B and C Local Leak Rate Tests (LLRTs); and (2) corrective actions to either eliminate or continue to reduce those local leakages significantly. The corrective actions are described in Attachment 2 to this letter along with an explanation of how they support this exemption request.

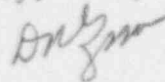
In summary, DECO has concluded that the exemption requested in Attachment 1 is warranted under the standards of 10CFR50.12, and that the modifications and improvements discussed in Attachment 2 represent an active and ongoing CAP. In addition, Attachment 2 demonstrates prudent steps have been, and will continue to be taken to improve the containment integrity of Fermi 2 and DECO's good-faith efforts to satisfy the requirements of Appendix J.

The proposed Technical Specification page change is included in Attachment 3. Detroit Edison has evaluated the proposed Technical Specifications against the criteria of 10CFR50.92 and determined that no significant hazards consideration is involved. The Fermi 2 Onsite Review Organization has approved and the Nuclear Safety Review Group has reviewed the proposed Technical Specifications and concurs with the enclosed determinations. In accordance with 10CFR50.91, Detroit Edison has provided a copy of this letter to the State of Michigan.

Prompt approval of this exemption request is requested in order to support planning for Fermi 2's fourth refueling, which is scheduled to begin in April 1994.

If you have any questions, please contact Mr. Bruce J. Sheffel at (313) 586-1848.

Sincerely,

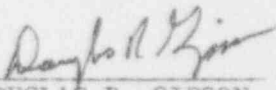


Attachments

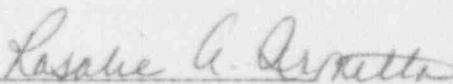
cc: T. G. Colburn  
A. B. Davis  
W. J. Kropp  
M. P. Phillips  
Supervisor, Electric Operators, Michigan  
Public Service Commission - J. R. Padgett

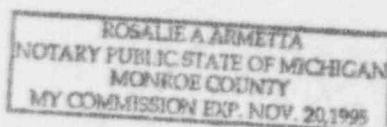
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I, DOUGLAS R. GIPSON, do hereby affirm that the foregoing statements are based on facts and circumstances which are true and accurate to the best of my knowledge and belief.

  
DOUGLAS R. GIPSON  
Senior Vice President

On this 24th day of May, 1993, before me personally appeared Douglas R. Gipson, being first duly sworn and says that he executed the foregoing as his free act and deed.

  
Notary Public



Attachment 1

Fermi 2

10CFR50, Appendix J, Type A Testing  
Request for Exemption from Scheduling Requirements

Fermi 2  
10CFR50, Appendix J, Type A Testing  
Request for Exemption From Scheduling Requirements

A. Exemption Request

Section III.A.6(b) of 10CFR50 Appendix J and Fermi 2 Technical Specification Surveillance Requirement 4.6.1.2.a.9 requires that:

"If two consecutive periodic Type A tests fail to meet the applicable criteria (.75La) in III.A.5(b), notwithstanding the periodic retest schedule for III.D., a Type A test shall be performed at each plant shutdown for refueling or approximately every 18 months, whichever occurs first, until two consecutive Type A tests meet the acceptance criteria in III.A.5(b), after which time the retest schedule specified in III.D may be resumed."

The purpose of Type A testing is to ensure that the leakage through the primary reactor containment would not exceed the maximum allowable leakage during a design basis accident (DBA). It also provides assurance that the Local Leak Rate Test (LLRT) Program adequately identifies and corrects containment penetrations requiring repair. Since 1989, Detroit Edison (DECo) has conducted two LLRTs as required by Fermi 2 Technical Specifications and 10CFR50, Appendix J, and has significantly improved the leak tight integrity of the overall containment. Since the measured leak rate during the performance of the Type A test is due in large part to the performance of the containment isolation valves, the improvement in the leak tight integrity of the containment is a result of improvements in containment isolation valve leak integrity and leak rate test performance. The improvement in the integrity of the containment is due in large part to DECo's aggressive approach to correcting valves which exhibit poor leak rate test performance. This approach included valve replacement, changes in the design for improved reliability and improvements in testing methodologies. Examples of these improvements are included in Attachment 2 to this exemption request.

Detroit Edison Company hereby requests an exemption from 10 CFR 50 Appendix J, Paragraph III.A.6(b) and Fermi 2 Technical Specification Surveillance Requirement 4.6.1.2.a.9. DECo is following the guidance of Information Notice (IN) 85-71 in requesting this exemption. IN No. 85-71, titled "Containment Integrated Leak Rate Testing," provides for licensees to submit a Corrective Action Plan (CAP) with an alternative leakage test program proposal as the basis of an exemption request for NRC



Staff review. If the submittal is approved, the licensee may implement the corrective action plan and alternative leakage test program in lieu of the required increase in Type A test frequency incurred after the failure of two successive Type A tests. DECo's CAP instituted to respond to the 1989 and 1992 Integrated Leak Rate Test (ILRT) failures is provided in Attachment 2 for NRC Staff review. If this CAP and exemption request are approved by the NRC Staff, DECo intends to resume the retest schedule specified in 10 CFR 50, Appendix J, Section III.D and Fermi 2 Technical Specification 4.6.1.2.a.8.

If the exemption request is approved, the Type A tests presently scheduled to be performed in RF-04 and RF-05 will be replaced with a single test in RF-05. NRC Staff approval of this exemption would not only relieve Fermi 2 from the increased frequency testing requirements of 10 CFR 50, Appendix J, Paragraph III.D.(a) but also Fermi Technical Specification Surveillance Requirement 4.6.1.2. Relief from the above schedular requirements would also result in reductions in personnel exposure, consistent with the concept of keeping radiation exposure As Low As Reasonably Achievable (ALARA), and minimize the significant costs associated with test performance and extended outage duration.

DECo has concluded that this exemption is warranted under the standards of 10CFR50.12(a) which provides that exemptions may be granted from the requirements in 10CFR50 if special circumstances are present and the exemptions authorized by law will not present an undue risk to public health and safety. Under 10CFR50.12(a)(2)(ii), special circumstances warranting an exemption are present whenever, among other things, application of the regulation in particular circumstances is not necessary to achieve the underlying purpose of the rule.

B. Discussion

Since 1984, DECo has conducted three Type A tests as required by 10 CFR 50 Appendix J, Paragraph IIIA.6(a) and (b) in addition to Fermi 2 Technical Specification Surveillance Requirement 4.6.1.2. The 1984 test was the preoperational test with the subsequent periodic tests performed in 1989 and 1992. The reported "As Left" leakages were 0.254 Wt. %/Day (24 hour test), 0.317 Wt. %/Day (10 hour test) and 0.243 Wt. %/Day (8 hour test) respectively. The reported "As Found" leakage rates for 1989 and 1992 tests were 0.958 Wt. %/Day and 1.097 Wt. %/Day respectively. As indicated by the "As Left" leakages, improvements have been made in the overall containment integrity.

The results of 1989 and 1992 ILRT's show a leakage rate for the "As Left" condition which is below both the 10 CFR Part 50, Appendix J maximum operational limit of 0.5 Wt.%/Day (La), and the Technical Specification maximum allowable leak rate of 0.375 Wt.%/Day (0.75La).

While the results of the "As Found" leakage rates for both the 1989 and 1992 tests exceeded the maximum operational limit of 0.375 Wt.%/Day an individual review of the contributing events leading to these failures indicates that containment integrity is improving due to the aggressive actions that DECo has taken to improve overall containment isolation valve leak tightness.

DECo has determined that Type C local leakage rates constituted the major contributor to the "As Found" failures during both the 1989 and 1992 ILRT's. Following the 1989 Refueling Outage and continuing through the 1991 and 1992 Refueling Outages, significant actions have been taken to address those valves which have exhibited a history of leakage rate failures. Corrective actions taken have been part of an iterative ongoing program to identify and correct valves which exhibit poor leakage testing performance. Actions taken include the modification of seven Main Steam Isolation Valves (MSIVs); replacement of MSIV Leakage Control System solenoid valves with air operated gate valves; replacement of Scram Discharge Drain flow control valves with globe valves; in addition to other valve replacements, redesigns, complete refurbishment and modifications to enhance containment isolation valve integrity and testability. Specific details regarding the analysis of the Type A test results to date, including the corrective actions planned or taken are provided in Attachment 2.

C. Justification of Exemption

DECo's exemption request from the requirements of 10CFR50, Appendix J, Section III.A.6(b), and Fermi 2 Technical Specification Surveillance Requirement 4.6.1.2, will not result in undue risk to the health or safety of the public:

1. The proposed exemption does not change, modify, or restrict existing plant safety limits, safety settings, or operations. The exemption will not adversely impact the design basis of containment or modify its response during a Design Basis Accident (DBA).
2. There are no undue adverse safety affects associated with this exemption, based on the corrective actions covered in Attachment 2.



3. The application of this regulation in this circumstance is not necessary to achieve the underlying purpose of the rule, which is to ensure that leakage through the primary reactor containment will not exceed the maximum allowable leakage during a DBA. DECo believes the continuing "corrective action" program provide justification for this conclusion.
4. The exemption would provide relief by reducing personnel exposure (ALARA), eliminating the significant cost of performing an increased frequency Type A test and by precluding outage extension for r rformance of the Type A test. DECo's efforts to improve the containment testing and maintenance programs represent DECo's good-faith efforts to comply with the regulation, and justify resumption of the normal Type A testing schedule.

Since RF-01, DECo's CAP has made several improvements to the plant to reduce local leakage rates through problem valves. These include the replacement of the MSIV leakage control system valve B21-F434 with a design more appropriate for the system service. It is important to note that this valve has passed all subsequent tests. The replacement of the CRD Scram Discharge Volume drain valves with a design more suited for the system service and also the addition of boundary and test connection valves to enable individual leak testing of the drain and vent valves. Since these modifications all four valves have passed all subsequent tests. Since RF-01 seven of the eight MSIV's including all four inboard valves have been modified to improve their leak tightness. Of the 11 tests performed to date on the modified MSIV's nine have passed representing a 80% improvement. The Core Spray Min flow valve E21-F031A was replaced because of worn seats and disk. This valve has also passed all subsequent testing since replacement. DECo has also implemented an enhanced packing replacement program on all containment isolation valves whenever valves require repacking, replacing existing packing with graphite packing material using live loading techniques.

As part of DECo's ongoing CAP two valves, P44-F606A and B, are scheduled for modification during the upcoming refueling outage. Even though these valves have not been a major contributor to the "As-Found" failures of the 1989 and 1992 ILRTs, they have been less than average performers. These valves are presently orientated horizontally, they will be replaced with new valves and have their orientation changed to vertical which is the optimum design orientation. Based on the above CAP actions taken to date and those planned, DECo maintains reasonable assurance

that future "As-Found" ILRTs will meet the acceptance criteria specified in 10CFR50, Appendix J, paragraph III.A.5(b), and Fermi 2 Technical Specification Surveillance Requirement 4.6.1.2.

D. Conclusion

Fermi 2 has maintained an aggressive program for improving overall containment integrity. The results of this program are evident in the following reported "As-Left" ILRT results for tests performed in 1989 and 1992:

	Reported "As-Left" ILRT results (Wt.%/Day)	Allowable Operational Leak Rate (Wt.%/Day)	Fermi 2 Maximum Allowable Leak Rate (Wt.%/Day)
1989	0.317	0.375	0.5
1992	0.243	0.375	0.5

The above results of the 1989 and 1992 ILRT's show a "As-Left" leakage rate for the containment which has averaged 75% of the 10CFR50, Appendix J operational limit of 0.375 Wt.%/Day, and approximately 50% of the maximum allowable leak rate of 0.5% Wt.%/Day.

The reported "As-Left" results in 1989 and 1992 have shown an improving trend. The "As-Left" containment condition in 1992 has improved by 0.074 Wt.%/Day when compared to 1989. Analysis presented in Attachment 2 of leakage results also indicates an improving trend in the Type B and C leakage penalties taken (i.e., a reduction in the number applied in 1992 from that applied for 1989). Type B and C leakage penalties applied to Type A Test results, have improved by 22% from 1989 to 1992 with respect to Type A Test Results. Type B and C leakage penalties are calculated by subtracting the As-Left leakage from the As-Found leakage for penetrations prior to the performance of the Type A test. Excluding those penetrations, which caused the Type A As-Found failures in 1989 and 1992, for which corrective action has been taken Fermi 2 "As-Found" condition would have met the maximum allowable leakage rate of 0.5 Wt.%/Day with significant margin, and also the allowable operational leak rate of 0.375 Wt.%/Day. The significance of this is that corrective maintenance has been performed and was effective in addressing the penetration failures which caused the "As-Found" failures of the Type A tests in 1989 and 1992. Attachment 2 provides the failed penetrations and the corrective actions along with a table that further demonstrates the above.

As indicated above, DECo has identified the high leakage contributors in 1989 and 1992 and has formulated a corrective action plan that has and will continue to reduce containment isolation valve leakage.

Therefore, DECo's corrective action plan serves to assure the underlying purpose of Appendix J by assuring overall containment integrity. Performing an increased frequency Type A test would not address the known containment isolation valve leakage causal factor for previous Type A test failures, nor provide insight into identification of further corrective actions.

Based on the information provided in this submittal, DECo concludes that the requested exemption is warranted and that the underlying purpose of the regulation would still be met. The results of DECo's efforts have substantially reduced containment leakage, and resumption of the normal Type A testing schedule is justified. Upon NRC Staff approval of this exemption request, and DECo's ongoing CAP, DECo intends to resume the following schedule for periodic Type A testing with the next scheduled test being in the fall of 1995 (Fifth Refueling Outage).

E) Significant Hazards Consideration

In accordance with 10CFR50.92, Detroit Edison has made a determination that the proposed amendment involves no significant hazards considerations. To make this determination, Detroit Edison must establish that operation in accordance with the proposed amendment would not: 1) involve a significant increase in the probability or consequences of an accident previously evaluated, or 2) create the possibility of a new or different kind of accident from any accident previously evaluated, or 3) involve a significant reduction in a margin of safety.

The proposed change provides a scheduler exemption to the increased frequency testing requirements contained in Fermi 2 Technical Specification 4.6.1.2 for the primary containment Integrated Leak Rate Test. The change does not:

1. Involve a significant increase in the probability or consequences of an accident previously analyzed.

This change allows the submittal of a Corrective Action Plan (CAP) as an exemption to Appendix J requirements for NRC Staff review in lieu of more frequent Type A tests. The approval of a CAP as an alternative, will adequately maintain containment leakage surveillance requirements and overall containment integrity. Therefore, this change cannot increase the probability or consequences of an accident.

2. Create the possibility of a new or different kind of accident from any previously analyzed.

It has been determined that a new or different kind of accident will not be possible due to this change. Since there are no changes in the way the plant is operated, the potential of an unanalyzed accident is not created. No new failure modes and no new testing methodologies are introduced.

3. Involve a significant reduction in a margin of safety.

Plant Technical Specifications including an NRC-approved CAP ensure that the containment's margin of safety is maintained. The CAP, for penetrations determined to be the cause of the failure of the "As-Found" ILRTs, will provide added assurance that containment integrity will be maintained without the need for additional ILRTs. Moreover, before Detroit Edison may utilize the proposed alternative, its CAP must be formally approved by the NRC Staff as an exemption to Appendix J, pursuant to 10CFR50.12. Thus, the addition of a CAP, as an alternative to increased Type A test frequency, will not reduce the margin of safety.

Based on the above, Detroit Edison has determined that the proposed amendment does not involve a significant hazards consideration.

#### ENVIRONMENTAL IMPACT

Detroit Edison has reviewed the proposed Technical Specification changes against the criteria of 10CFR51.22 for environmental considerations. The proposed change does not involve a significant hazards consideration, nor significantly change the types or significantly increase the amounts of effluents that may be released offsite, nor significantly increase individual or cumulative occupational radiation exposures. Based on the foregoing, Detroit Edison concludes that the proposed Technical Specifications do meet the criteria given in 10CFR51.22(c)(9) for a categorical exclusion from the requirements for an Environmental Impact Statement.

#### CONCLUSION

Based on the evaluation above: 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 proposed amendments will not be inimical to the common defense and security or to the health and safety of the public.

MESSAGE DISPLAY

To Fitzsimmons, Rich  
CC Carrabino, Kari

From: Carrabino, Kari Host: CEONET3  
Postmark: May 20,93 3:53 PM Delivered: May 20,93 3:53 PM

Subject: Forwarded: Reply to: Forwarded: RANDOM SELECTEES

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Comments:

From: Carrabino, Kari:FERMI

Date: May 20,93 3:53 PM

I was wrong--Peggy Offerle is in this afternoon. She finished early and came in to work. She's on her way now to GTOC for her random testing. Sorry for the confusion.

Previous comments:

From: Carrabino, Kari:FERMI

Date: May 20,93 1:09 PM

P. Offerle is at the Perry plant and will not be returning until this evening. We do not expect her to come in to work until tomorrow morning (~7:30 a.m.) so she is exempt from the random testing on May 20, 1993

Message:

From: Fitzsimmons, Rich:FERMI

Date: May 20,93 11:45 AM

Please see attached. --- Automatic-Mail

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Attachment 2

Fermi 2

10CFR50, Appendix J, Type A Testing  
Corrective Action Plan

Fermi 2  
10CFR50, Appendix J, Type A Testing  
Corrective Action Plan

A. Condition

The "As-Found" Integrated Leak Rate Tests (ILRTs) performed in 1989 and 1992 at Fermi 2 failed to meet the acceptance criteria specified in paragraph III.A.5(b) of 10CFR50, Appendix J and Fermi 2 Technical Specification Surveillance Requirement 4.6.1.2.a.2.

B. Root Cause of the Condition

In both instances, Detroit Edison Company (DECO) has determined that Type C local leakage rates were the primary contributor to the "As-Found" failures.

C. Applicable Regulatory Requirements

Appendix J of 10CFR50, Paragraph III.A.6(b) and Fermi 2 Technical Specification Surveillance Requirement 4.6.1.2.a.9, requires, in part, that "if two consecutive periodic Type A tests fail to meet the applicable acceptance criteria in III.A.5(b) and T. S. 4.6.1.2.a.3, a Type A test shall be performed at each plant shutdown for refueling or approximately 18 months, whichever occurs first, until two consecutive Type A tests meet the acceptance criteria in III.A.5(b) and T.S. 4.6.1.2.a.9, after which time the retest schedule specified in III.D may be resumed."

Information Notice (IN) No. 85-71, "Containment Integrated Leak Rate Tests" states that if Type B and C leakage rates constitute an identified contributor to the Failure of the "As-Found" ILRT, the licensee may submit a Corrective Action Plan (CAP) with an alternative leakage test program proposal as an exemption request. Item D below provides the CAP implemented and proposed to address the 1989 and 1992 ILRT failures. Item E outlines and provides an analysis of the 1989 and 1992 ILRT "As-Found" failures. Item F discusses DECO's plans for implementing an alternative leakage test program.

D. Corrective Action Plan

1. Corrective Action Taken to Address 1989 "As-Found" ILRT Failure

The 1989 "As-Found" ILRT failure was due to excessive leakage from Penetrations X-7A through D (Main Steam Line), X-37/38 (Scram Discharge Volume Vent and Drains), and X-47C (Nitrogen Inerting Drywell Pressure Sensing Line Isolation Valve) during the performance of Type C testing. During the "As-Found" ILRT testing for the 1989 Type A test all eight of the MSIV's B21-F022A through D and B21-F028A through D and the Division I MSIV Leakage Control System isolation valve, B21-F434, failed because of excessive leakage. During this refuel all four inboard MSIVs B21-F022A through D were modified to improve leak tightness. This modification included new bonnets, larger stems, anti-rotation nose-cone, and improved tolerance on the valve rib guides. Subsequent to these modifications these valves have been tested twice, once in 1991 and again in 1992. All four valves passed their leak rate testing in both 1991 and 1992 with no repair work required. Also, during 1989 the MSIV Leakage Control (B21-F434) valve was replaced with a valve design more appropriate for the system service. This valve has also been tested twice subsequent to its replacement and it has passed both leak rate tests in 1991 and 1992. During the non ILRT outage in 1991 three of the outboard MSIVs were modified with the same modification as the inboards. As a result of the modifications to the MSIV's there has been a reducing trend in the number of failures, (1989 - eight failures, 1991 - three failures and 1992 - two failures). The 1991 and 1992 failures were all outboard valves. The 1989 Type "A" test results included MSIV leakage in the total leakage. The staff review of this report indicated that this is unnecessary based on the operation of the MSIV Leakage Control System. This is also addressed in Fermi 2 SSER5, page 6-3. The leakage through X7A-D was thus addressed by replacement of B21-F434 and the exclusion of MSIV leakage. Results for Penetrations X-7A through D, during the 1991 and 1992 were 0.05 SCFH for both years for the "As-Found" condition (0.00008 Wt.%/Day). This shows the acceptance criterion has been met and the corrective action taken for this penetrations "As-Found" failure in 1989 has been demonstrated to be successful.

Penetration X-37/38 has Containment Isolation Valves C11-F010 and C11-F180 (CRD Scram Discharge Volume Vent Valves) and C11-F011 and C11-F181 (CRD Scram Discharge Volume Drain Valves). As a result of repeated failures, and this penetration's major contribution to the "As-Found" Type

A failure in 1989, an Engineering Design Package (EDP), was prepared and implemented in 1991. Before this EDP, the test boundary required pressurization against all 185 CRD's, as well as, testing one vent and drain valve together. This allowed for many potential leak paths. The EDP installed test boundary valves and test connections to allow individual testing of each valve. This EDP also completely replaced the two drain valves C11-F011 and C11-F181. Since the addition of the block valve the two vent valves have passed both their "As-Found" tests. Also, the two drain valves C11-F011 and C11-F181 have passed their "As-Found" test in 1991 (new valves) and 1992. The results of these subsequent LLRTs for Penetration X-37/38 indicate that the actions taken in 1991 were successful in addressing the leakage problem. No subsequent maintenance has been required to be performed on these valves to maintain their leak tightness. Results for these penetrations during 1991 and 1992 LLRTs were 3.14 SCFH and 2.03 SCFH for the "As-Found" conditions (0.005 Wt.%/Day) and 0.003 Wt.%/Day respectively). This shows that the acceptance criterion of 10 SCFH (0.017 Wt.%/Day) was met with significant margin. The corrective action taken for the failure of the 1989 "As-Found" LLRT, is demonstrated in the success of the 1991 and 1992 LLRTs.

Penetration X-47C is an instrument line with a single isolation valve T48-F451. T48-F451 has failed its LLRT in both 1989 and 1992 and passed during 1991. During 1989 the valve was found to be not fully closing. The corrective action was to rework the air operator and increase the closing force. After the failure in 1992 the valve was repacked and operator checked for the correct tolerances. Still after this work the valve did not show repeatability in going full closed. Further investigation showed there was a misalignment between the operator and valve causing a side load on the stem, resulting in reduced closing force. The valve showed repeatability with complete closure and acceptable leak rate results after the operator was realigned.

The error in the valve's operator alignment was identified and corrected during the performance of the LLRT. Results for this valve during the 1991 and 1992 LLRTs were 0.05 SCFH and 0.247 SCFH for the "As-Found" condition (0.00008 Wt.%/Day and 0.0004 Wt.%/Day respectively). This shows an improvement from the 1989 "As-Found" results of 10.28 SCFH (0.017 Wt.%/Day). This, along with the operator realignment completed in 1992, causes DECo to believe the corrective action taken for this valve has corrected all previous problems.

The 1989 "As-Found" ILRT failed as a result of excessive Type C leakage experienced from Penetrations X-7A through D, X-37/38, and X-47C. Other penetrations did not meet the individual penetration LLRT leakage rate administrative acceptance criterion in 1989, however, these other penetrations only slightly exceeded the LLRT acceptance criterion and their combined leakage was not identified as major contributor to the 1989 "As-Found" ILRT failure. Total leakage improvement from valve rework from the other penetrations was 26.75 SCFH (0.045 Wt.%/Day).

2. Corrective Action Taken to Address 1992 "As-Found" ILRT Failure

The 1992 "As-Found" ILRT failed due to excessive leakage through penetrations X-9B and X-206D. The failure of Penetration X-9B was an administrative failure caused by insufficient "As-Found" data. The sequence of events related to this penetration are as follows:

- a. During As-Found condition leakage testing of inboard containment isolation valve B21-F010B, a significant leak ( $> 1.0$  La) was observed. Initial troubleshooting indicated that nearly all of the test leakage was through a valve body flange that is on the containment side of the test boundary and not through the valve seat. Since this leakage would not be a contributor to the penetration leakage during a DBA, many attempts were made to isolate the valve body flange leak to permit proper measurement of valve seat leakage. Due to the physical design/contour of the valve body, these attempts failed with isolation of the leak not possible.
- b. Outboard containment isolation valves B21-F076B, E51-F013 and G33-F120 were then As-Found tested in parallel. The parallel path leakage rate was again significant ( $> 1.0$  La). However, as before, troubleshooting demonstrated that the majority of the leakage was not through the test valves' seats but rather back through the B21-F010B body to flange leak test boundary.
- c. Feedwater Check valve B21-F010B was then repaired and retested with an As-Left result of 1.78 SCFH. Note that the identical sister valve B21-F010A was As-Found tested with good results (0.26 SCFH). Further, valve B21-F010B has been a good performer in past local leakage rate tests.



- d. Reactor Water Cleanup valve G33-F120 and Feedwater Check valve B21-F076B were also repaired because of outstanding Work Orders to repair the indicator shaft on G33-F120 and perform EQ Soft Seat replacement on B21-F076B. The work was performed before a second As-Found leakage test on the outboard valves.
- e. Ultimately, all valves in the penetration were reworked and the penetration was successfully As-Left tested.

The cause of the failure of B21-F010B was a flange leak. The corrective action was to build up the affected areas of both the flange and valve body and re-machine. With the correct re-assembly of the valve and repair of damaged area, no more corrective action is necessary and B21-F010B is expected to return to being a good performer.

Penetration X-206D is an instrument line which indicates torus level. As it is an instrument line this penetration has only one containment isolation valve (E41-F400). E41-F400 is a ballenoid operated globe valve. This valve has been a good performer in the past with As-Found leakage rates in 1989 and 1991 of 0.154 SCFH and 0.113 SCFH (0.0003 Wt.%/Day and 0.0002 Wt.%/Day respectively). During the refurbishment of this valve it was found to be containing water, rust, and scale. The valve internals were cleaned, reassembled, and the valve retested.

This penetration is classified as an instrument line with a single containment isolation valve (E41-F400). The single failure of E41-F400 would not have resulted in excessive leakage from the primary containment. This is based on all the piping which makes up this instrument line being designed and installed to quality group B criteria. This design criteria includes stress analysis with consideration given to dead-weight, thermal, and vibration conditions, seismic supports, and nuclear grade materials used throughout the system. Also, it is rated for temperature and pressure requirements which are greater than that of the containment. As such, it is classified as a closed system outside containment and will exist post LOCA. This second containment boundary was satisfactorily tested during the Type A test in 1992 with no adjustments. The closed system outside containment serves as an extended containment boundary. Further, the single CIV E41-F400 is normally open and receives no automatic closure signal and is required to be open post-LOCA to monitor torus level.

The 1992 "As-Found" ILRT failed as a result of excessive Type C leakage experienced from Penetrations X-9B and

X-206D. Other penetrations did not meet the individual penetration LLRT leakage rate acceptance criterion in 1992, however, these other penetrations only slightly exceeded the LLRT acceptance criterion and their combined leakage were not identified to be a major contributor to the 1992 "As-Found" ILRT failure. Total leakage improvement from rework of the other penetrations was 5.95 SCFH (0.010 Wt.%/Day).

E. Analysis of 1989 and 1992 ILRT "As-Found" Failures

Fermi 2 has maintained an aggressive program for improving overall containment integrity. The results of this program are evident in the following reported "As-Left" ILRT results for tests performed in 1989 and 1992:

	Reported "As-Left" ILRT Results (Wt.%/Day)
1989	0.317
1992	0.243

The above results of 1989 and 1992 have shown an overall improvement in the leak rate for the containment's "As-Left" condition.

The following information serves to demonstrate that excluding the LLRT failures of Penetrations X-7A through D, X-37/38, and X-47C in 1989, and LLRT failures of Penetrations X-9B and X-206D in 1992, "As-Found" containment leakage would have met the Technical Specification limit of .75 La (0.375 Wt.%/Day). The minimum pathway method for determining leakage rates was used to determine the "As-Found" condition for the containment in 1989 and 1992. The containment leakage rates excluding the above mentioned LLRT failures of 1989 and 1992, are as follows:

	ILRT Law "As-Left" (Wt.%/Day)		Type B and C Leakage Penalties (Wt.%/Day)		In-Service Penalties (Wt.%/Day)		ILRT Law "As-Found" (Wt.%/Day)
1989	0.285	+	0.045	+	0.032	=	0.362
1992	0.212	+	0.010 (1)	+	0.031	=	0.253

(1) Represents a downward trend from 1989.

Excluding penetrations X-7A through D, X-37/38, and X-47C in 1989 and penetrations X-9B and X-206 D in 1992, the 1989 and 1991 "As-Left" results would have met La (0.5 Wt.%/Day) as well as the 10CFR50, Appendix J and Fermi 2 Technical Specification Surveillance Requirement of 0.75 La (0.375 Wt.%/Day) with a margin. The "As-Left" ILRT results above show that the overall containment leakage, excluding the penetrations for which corrective actions were taken, has shown improvement from 1989 to 1992 by 64.81 SCFH (0.109 Wt.%/Day) or approximately a 30% improvement. Inservice penalties are added to take into account the penetrations which are not exposed to the accident pressure during the Type A test. The variation in the inservice penalties above reflects the fact that different penetrations were either isolated or inservice during the 1989 and 1992 ILRTs. This demonstrates that with the specified exclusions of penetrations X-7A through D, X-37/38, and X-47C in 1989 and penetrations X-9B and X-206D in 1992, the 1989 and 1992 "As-Found" ILRTs would have met the 10CFR50, Appendix J as well as Fermi 2 Technical Specification Surveillance Requirement of 0.75 La (0.375 Wt.%/Day). The significance of the above is that the cause of failure is fully understood and has been isolated to a finite set of containment isolation valves.

Fermi 2 has established stringent LLRT administrative leak rate acceptance criteria on a per valve basis, based on ASME Code guidance, individual valve test and maintenance history, design, function, and service. Test acceptance criteria ranges from 0.20 SCFH to 15.00 SCFH. This ensures valve leak tight integrity is maintained from Type A test to Type A test. DECO believes that if valves are repaired when they exceed their individual administrative acceptance criteria, and corrective modifications or replacements are implemented (as evaluation dictates) the overall containment integrity will be assured with future ILRTs meeting their "As-Found" acceptance criteria.

#### F. Alternative Leakage Test Program

The two As-Found Type "A" failures were caused by the addition of Type C penalties. To date all containment deficiencies have been identified during Type C testing. Based on these results, it is proposed that Type C testing be relied upon in lieu of the increased frequency Type A test. DECO is confident that additional testing is not required at this time. As noted in the Corrective Action Plan, the success of the previously implemented corrective action to address the failed penetrations in 1989 that resulted in the Type A "As-Found" failure, have been demonstrated during their 1991 and 1992 LLRTs. Of the two penetrations that caused the 1992 "As-Found" Type A failure one was an administrative failure based on maintenance being performed before "As-Found" test data was obtained. The other penetration would not have resulted in excessive leakage as there was a second containment boundary which was tested satisfactorily. Due to the corrective actions that have been taken DECO has a high degree of confidence that

continued Type C leakage testing is adequate to assure the underlying purpose of the regulation is achieved.

G. Conclusion

We believe DECO's CAP has adequately addressed the penetration failures that led to the 1989 "As-Found" Type A failure. The CAP included the modification to seven of the eight MSIVs to improve their leak tightness, (the remaining MSIV has not failed since 1989) the replacement of the MSIVLC valve, the replacement of the SCRAM Discharge Volume Drain valves, and the adjustment of the Nitrogen Inerting Drywell Pressure Sensing Line Isolation valve

The CAP instituted to address the 1992 "As-Found" Type A failure involves mechanisms to ensure that LLRT valves will not be released to maintenance until all "As-Found" testing is complete, and the repair of an external leak on a valve in the drywell causing a higher than normal amount of moisture in the containment.

This attachment presents an analysis which shows that implementation of the proposed corrective action plan provides assurance that the underlying purpose of Appendix J is being met. The analysis demonstrates that excluding the LLRT penetration failures in 1989 and 1991, the Fermi 2 "As-Found" condition met the maximum allowable leak rate of 0.5 Wt.%/Day with significant margin. The proposed corrective action plan specifically targets the leakage contributors of 1989 and 1992. Therefore, DECO has reasonable assurance that implementation of the CAP will allow Fermi 2 to meet the allowable operational leak rate of 0.375 Wt.%/Day during the 1995 "As-Found" ILRT.