**Douglas R. Gipson**
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**Detroit Edison**

10CFR50.73

October 25, 1999
NRC-99-0096

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

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

2) Fermi 2 Letter to NRC (NRC-99-0092)
"Request for Enforcement Discretion,"
dated September 24, 1999

Subject: Licensee Event Report (LER) No. 99-005

Pursuant to 10 CFR 50.73(a)(2)(i)(B), Detroit Edison is submitting the enclosed LER No. 99-005. The LER documents the failure of a Containment Drywell Air Purge Isolation Valve Local Leak Rate Test.

No new commitments are being made in this LER beyond those included in Reference 2.

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

Sincerely,

cc: J. Dyer
A. J. Kugler
A. Vegel
M. V. Yudasz, Jr.
NRC Resident Office
Region III
Wayne County Emergency Management Division

IE22

PDR ADOCK

NRC FORM 366 (6-1998) U.S. NUCLEAR REGULATORY COMMISSION

# LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/2001



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TITLE (4)
Containment Purge Isolation Valve Local Leak Rate Test Failure

| EVENT DATE (5) | | | LER NUMBER (6) | | | REPORT DATE (7) | | | OTHER FACILITIES INVOLVED (8) | |
|---|---|---|---|---|---|---|---|---|---|---|
| MONTH | DAY | YEAR | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | MONTH | DAY | YEAR | FACILITY NAME | DOCKET NUMBER |
| 09 | 24 | 99 | 99 | --0 0 5- | 00 | 10 | 25 | 99 | | 05000 |
| | | | | | | | | | FACILITY NAME | DOCKET NUMBER |
| | | | | | | | | | | 05000 |

| OPERATING MODE (9) | 1 |
|---|---|
| POWER LEVEL (10) | 97 |

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

| | | | | | |
|---|---|---|---|---|---|
| | 20.2201(b) | | 20.2203(a)(2)(v) | X 50.73(a)(2)(i) | 50.73(a)(2)(viii) |
| | 20.2203(a)(1) | | 20.2203(a)(3)(i) | 50.73(a)(2)(ii) | 50.73(a)(2)(x) |
| | 20.2203(a)(2)(i) | | 20.2203(a)(3)(ii) | 50.73(a)(2)(iii) | 73.71 |
| | 20.2203(a)(2)(ii) | | 20.2203(a)(4) | 50.73(a)(2)(iv) | OTHER |
| | 20.2203(a)(2)(iii) | | 50.36(c)(1) | 50.73(a)(2)(v) | Specify in Abstract below or in NRC Form 366A |
| | 20.2203(a)(2)(iv) | | 50.36(c)(2) | 50.73(a)(2)(vii) | |

LICENSEE CONTACT FOR THIS LER (12)

| NAME | TELEPHONE NUMBER (Include Area Code) |
|---|---|
| Peter W. Smith, Supervisor - Compliance | (734) 586-4271 |

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

| CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO EPIX | CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO EPIX |
|---|---|---|---|---|---|---|---|---|---|
| X | VB | ISV | J010 | Y | | | | | |
| | | | | | | | | | |

| SUPPLEMENTAL REPORT EXPECTED (14) | | | EXPECTED | MONTH | DAY | YEAR |
|---|---|---|---|---|---|---|
| | YES (If yes, complete EXPECTED SUBMISSION DATE). | X NO | | | | |

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

At approximately 1345 hours on September 22, 1999, it was determined that the 24 inch inboard Drywell Air Purge isolation valve had failed a Local Leak Rate Test (LLRT). The measured leakage rate exceeded the Technical Specifications (TS) limit of 0.05La. With the limit exceeded, TS require the affected valve to be restored to operable status within 24 hours, otherwise a plant shutdown is required. In addition, the outboard Drywell Air Purge isolation valves were deactivated in the closed position within four hours as required by TS. At 1345 hours on September 23, 1999, the 12 hour TS shutdown action was invoked. Since the inboard valve cannot be repaired during plant operation, a plant shutdown was initiated at approximately 1600 hours on September 23, 1999. A one hour notification of initiation of a TS required plant shutdown was made in accordance with 10 CFR 50.72(b)(1)(i)(A). A Notice of Enforcement Discretion (NOED) was requested and verbally granted on September 23, 1999 and the shutdown was terminated. A blind flange was installed over the accessible 24 inch outboard isolation valve. The cause of the LLRT failure is believed to be mechanical degradation of the inboard valve resilient seal. The valve will be repaired during the next plant shutdown. At 0145 hours on September 24, 1999, plant operation continued under the provisions of the NOED, with the inoperable Drywell Air Purge inboard isolation valve, beyond the time permitted by TS. However, operation under a NOED is reportable in accordance with 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by TS.

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**TEXT** *(If more space is required, use additional copies of NRC Form 366A)* **(17)**

Initial Plant Conditions:

| | |
|---|---|
| Operational Condition | 1 (Power Operation) |
| Reactor Power | 97 Percent |
| Reactor Pressure | 1024 psig |
| Reactor Temperature | 540 degrees Fahrenheit |

Description of the Occurrence:

On September 22, 1999, a Local Leak Rate Test (LLRT) was performed for the Drywell Air Purge [VB] penetration (X-26), as required by Technical Specification (TS) 3/4.6.1.8, Drywell and Suppression Pool Purge System. This penetration has three containment isolation valves [ISV] that are tested concurrently. The inboard isolation valve is a 24 inch butterfly valve. There are two outboard isolation valves: a second 24 inch butterfly valve which is open directly to the secondary containment; and, a ten inch butterfly valve which connects to the nitrogen supply. These valves all have resilient seals. Penetration X-26 is used to inert the primary containment with nitrogen, or purge the containment with air. The LLRT for this penetration is accomplished by pressurizing the penetration between the inboard and outboard isolation valves and measuring the total leakage from the penetration.

At approximately 1345 hours on September 22, 1999, it was determined that the inboard isolation valve had failed the LLRT. The measured leakage rate exceeded the specified limit, 0.05 La (14.87 scfh). With the specified leakage rate exceeding the TS limit, TS 3.6.1.8 requires that the affected valves be restored to operable status within the 24 hours or the plant placed in at least hot shutdown within the next 12 hours and in cold shutdown within the following 24 hours. At approximately 1447 hours on September 22, 1999, the Drywell Air Purge outboard isolation valves were deactivated in the closed position, satisfying the requirement of TS 3/4.6.3, Primary Containment Isolation Valves.

At 1345 hours on September 23, 1999, the 12 hour shutdown Action of TS 3.6.1.8 was invoked. At approximately 1600 hours, a plant shutdown was initiated in accordance with TS 3.6.1.8, with power being reduced from 97 percent to approximately 91 percent. At 1647 hours, a one hour notification of initiation of a TS required plant shutdown was made in accordance with 10 CFR 50.72(b)(1)(i)(A), Event Number 36217. At approximately 1730 hours, NRC verbally granted a Notice of Enforcement Discretion (NOED), permitting continued plant operation with the inoperable Drywell Air Purge inboard isolation valve. Reactor power was returned to 97% at approximately 1830 hours. At 0145 hours on September 24, 1999, plant operation continued under the provisions of the NOED, with the inoperable Drywell Air Purge inboard isolation valve beyond the time permitted by TS 3.6.1.8 for an inoperable purge isolation valve. However, operation under a NOED is reportable in accordance with 10 CFR 50.73(a)(2)(i)(B), as a condition prohibited by TS.

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**TEXT** *(If more space is required, use additional copies of NRC Form 366A)* **(17)**

Cause of the Occurrence:

The cause of this event is believed to be degradation of the resilient seal associated with the inboard isolation valve. When the LLRT was initially performed, the penetration leaked at a rate of 26.7 scfh. Based on direct observation of the outboard 24 inch butterfly valve, and observation of an open three quarter inch vent connection upstream of the ten inch valve, test personnel determined that the penetration failed its LLRT due to seat leakage through the 24 inch inboard valve. Subsequently, the 24 inch inboard valve, was stroked with the penetration slightly pressurized in an attempt to clear the sealing surfaces of any debris that may have been causing the observed leakage. The LLRT was performed again, and the leakage from penetration X-26 increased to 82.85 scfh. Since the only evolution performed between the two LLRTs was the stroking of the 24 inch inboard valve, it was surmised that the leakage is attributable to the 24 inch inboard valve. Visual and audio inspections (utilizing Snoop to aid in leak detection) for leakage were made during both LLRTs by qualified inspectors, at the exposed side of the 24 inch outboard valve, and at the vent connection upstream of the outboard ten inch valve. These inspections confirmed that there was insignificant leakage at the outboard valves relative to the measured leakage rates and substantiated the assessment that the outboard isolation valves are tight.

Review of the LLRT and maintenance records did not indicate any adverse trend for this penetration. Results of previous tests indicate that the penetration leakage has been between approximately 0.6 scfh and 1.75 scfh since October of 1998 (four tests). Failure of the 24 inch inboard valve, was not anticipated; and based on the magnitude of the leak and the change in leakage following valve stroke, the likely cause of the leakage is mechanical degradation of the resilient seal. The seal was replaced during the Sixth Refueling Outage (Autumn of 1998). Based on the extremely good test results from the previous tests, and the observed behavior of the penetration during the recent LLRTs, the most likely cause of this test failure is attributable to the 24 inch inboard valve.

Analysis of the Occurrence:

This event had no adverse impact on the health and safety of the public. The overall primary containment leakage allowed by TS 3.6.1, Containment Integrity, is 0.6 La (178 scfh). La is the overall containment leakage assumed for the evaluation of radiological consequences of postulated accidents considered in the Updated Final Safety Analysis Report (UFSAR). The results of the accident analyses presented and the UFSAR were judged to be acceptable provided that La is not exceeded. The TS are conservative relative to the UFSAR analyses by further limiting the maximum allowed containment leakage to 0.6 La. Tests are routinely performed to verify that the measured leakage does not exceed the TS limit. Most tests are LLRTs of individual containment penetrations.

Two methods are permitted to evaluate LLRT results, depending on when the test is conducted. The maximum path leakage method is used during scheduled outages, such as refueling outages, to verify that the as-left containment leakage is within the TS limit. During routine LLRTs conducted during plant operation, use of the minimum path leakage method is permitted by regulatory guidance for implementation of 10 CFR 50, Appendix J, Primary Containment Leakage Testing for Water Cooled Power Reactors, Option B, Performance Based Requirements.

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The maximum path leakage is the maximum leakage rate that can be attributed to a specific penetration leakage path (inboard or outboard valves). The maximum path leakage is the larger, not the total leakage through two valves in series, the typical configuration of most containment penetrations. The minimum path leakage is the minimum leakage that can be attributed to a specific containment penetration. The minimum path leakage is the smaller of the individual leakage rates for the inboard and outboard isolation valves. In practice, the minimum path leakage is one-half of the total measured leakage rate for a penetration, when the penetration is pressurized between the inboard and outboard barriers.

Prior to the September 22, 1999 LLRT of Penetration X-26, the known maximum path leakage for the primary containment was 67.28 scfh. The maximum path leakage for Penetration X-26 from the September 22 LLRT was 82.85 scfh. The total maximum pathway leakage following the Penetration X-26 LLRT was 150.13 scfh, leaving a margin of 27.87 scfh to the 0.6 La TS limit (178 scfh). These results were reported in Detroit Edison's September 24, 1999 request for a NOED. Subsequently, the results of LLRTs of other purge and vent valve penetrations, performed on September 20 and 22, 1999, were factored into the total maximum pathway leakage. This resulted in the total maximum path leakage being adjusted to 149.0 scfh, leaving a margin of 29.0 scfh to the 0.6 La TS limit (178 scfh).

Use of the maximum path leakage method is conservative because the second isolation valve is not credited as a leakage barrier. However, use of the minimum path leakage method is appropriate, and is permitted since these LLRTs were performed during normal operation. The minimum path leakage method results in a 104.79 scfh margin to the 0.6 La TS limit. Therefore, this event had no adverse impact on the health and safety of the public because there is significant margin to the 0.6 La TS limit (178 scfh).

Corrective Actions:

On September 22, 1999, the Drywell Air Purge outboard isolation valves were deactivated in the closed position, satisfying the requirements of TS 3/4.6.3, Primary Containment Isolation Valves. Because the 24 inch inboard valve cannot be repaired until the next plant shutdown, a NOED was requested and verbally approved on September 23, 1999 to permit continued operation with the 24 inch inboard isolation valve exceeding its specified leakage rate, until the next plant shutdown when the valve can be repaired. The NOED was formally granted by NRC letter to Detroit Edison dated September 24, 1999. The NOED is in force until NRC approves an exigent license amendment. The license amendment, which was requested on September 24, 1999, will implement the conditions of the NOED in the TS. The license amendment was approved on October 19, 1999. On September 25, 1999, in conformance with the conditions of the NOED, a blind flange was installed on the 24 outboard inch outboard isolation valve providing an additional leakage barrier. In addition, the penetration will

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**TEXT** *(If more space is required, use additional copies of NRC Form 366A)* **(17)**

be leak tested and the integrity of the outboard valves will be qualitatively verified at a 45 day frequency, and the isolation valves will be verified to be deactivated in the closed position every 31 days. The valve will be repaired at the next plant shutdown.

Additional Information:

A. Component Data

| | |
|---|---|
| Component: | Drywell Air Purge Inboard Isolation Valve |
| Description: | 24 inch Butterfly Valve |
| Manufacturer: | Neles-Jamesbury |
| Model Number: | 24-8222EX MOD. A |

B. Previous Similar Events

There were no previous similar events within the last five years.