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ComEd

February 23, 1995

TPJLTR 95-0022

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

Licensee Event Report 95-006, Docket 50-237 is being submitted as a voluntary report.

Sincerely,

Thomas P. Joyce
Site Vice President
Dresden Station

TPJ/kls

Enclosure

cc: J. Martin, Regional Administrator, Region III
NRC Resident Inspector's Office
File/NRC
File/Numerical

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NRC FORM 366 (5-92) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 5/31/95

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Dresden Nuclear Power Station, Unit 2	05000237	1 OF 8

TITLE (4)
TIP System Isolation Does Not Have 'Seal In' Logic On Group II Isolation

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
01	26	95	95	-- 006 --	00	02	23	95	Dresden Unit 3	05000249
									FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	Run	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
POWER LEVEL (10)	097		20.2201(b)		20.2203(a)(3)(i)		50.73(a)(2)(iii)		73.71(b)
			20.2203(a)(1)		20.2203(a)(3)(ii)		50.73(a)(2)(iv)		73.71(c)
			20.2203(a)(2)(i)		20.2203(a)(4)		50.73(a)(2)(v)	X	OTHER
			20.2203(a)(2)(ii)		50.36(c)(1)		50.73(a)(2)(vii)		(Specify in Abstract below and in Text, NRC Form 366A)
			20.2203(a)(2)(iii)		50.36(c)(2)		50.73(a)(2)(viii)(A)		
			20.2203(a)(2)(iv)		50.73(a)(2)(i)		50.73(a)(2)(viii)(B)		
			20.2203(a)(2)(v)		50.73(a)(2)(ii)		50.73(a)(2)(x)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
George J. Piccard, System Engineer Ext. 2377	(815) 942-2920

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)			EXPECTED SUBMISSION DATE (15)	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)

The Primary Containment Isolation System (PCIS) logic associated with the Traversing Incore Probe (TIP)system allows a TIP ball valve to reopen without operator action after initiation and subsequent reset of a group II PCIS signal. This condition is contrary to information contained in section 7.3.2.4 of the Updated Final Safety Analysis Report (UFSAR) which states that logic for these valves will not allow valves to automatically reopen after the isolation signal is reset. Thus, the NRC was voluntarily notified of a potential degraded/unanalyzed condition pursuant to 10CFR50.72(b)(1)(ii). Further investigation revealed, that the record does not adequately recognize that the TIP system had been excluded from consideration under the NUREG 0737 position. The Dresden UFSAR statement in section 7.3.2.4 apparently was not intended to include the TIP system.

Based upon a review of documents it appears that, in 1979, ComEd reviewed the TIP System with respect to NUREG-0578 and concluded that the TIP system penetrations were instrument lines, and a closed loop system. ComEd upheld that position in regards to its response to NUREG-0737 in 1980. Therefore the system did not need to be considered for the Group II isolation reset modification. Modifications made to PCIS logic in the early 1980's did not include the TIP ball valves.

The record indicates that the licensing basis for this issue is unclear regarding the applicability of NUREG 0737 positions to the TIP system. While the safety consequences of the current design are minimal, we have concluded that the prudent action is to modify the design to preclude automatic reopening of the TIP ball valve following reset of a Group II isolation signal.

EVENT IDENTIFICATION:

TIP System [IG] Isolation Does Not Have 'Seal In' Logic on Group II Isolation.

A. PLANT CONDITIONS PRIOR TO EVENT:

Unit: 2(3) Event Date: 01/26/95 Event Time: 1545

Reactor Mode: N Mode Name: Run(Run) Power Level: 97%(97%)

Reactor Coolant System Pressure: 1000(1000) psig

B. DESCRIPTION OF EVENT:

On January 26, 1995, a review of the Primary Containment Isolation System (PCIS) logic associated with the Traversing Incore Probe (TIP) revealed a design which would allow a TIP ball valve to reopen without operator action after initiation and subsequent reset of a group II PCIS signal. This condition, is contrary to information contained in section 7.3.2.4 of the Updated Final Safety Analysis Report (UFSAR) which states that logic for these valves will not allow valves to automatically reopen after the isolation signal is reset.

This condition was detected as a result of a similar condition reported at Quad Cities, LaSalle and Cooper Generating Stations.

The initial investigation on January 26, 1995 determined the following information:

When a Group II isolation is initiated, the TIPs receive a withdrawal signal. When the TIP probe enters the shield, the ball valves will automatically close. A review of plant electrical drawings indicated that upon resetting a Group II PCIS signal, the logic governing the TIP ball valves will reopen the valves after a 5 minute time delay if the control switches are in the open position. Also, if the TIP Drive Control Unit (DCU) is left in the forward position, the TIP will reinsert after resetting the isolation and a 5 minute time delay. An insertion of a TIP automatically opens the ball valve. The TIP purge solenoid valve will also reopen when the isolation is reset if the control switch is in the open position.

Dresden Station UFSAR section 6.2.4 describes the containment isolation system and lists Isolation Valves in table 6.2-9. Section 3.8-4 of the UFSAR lists primary containment instrument penetrations. The TIP penetration lines are listed as instrument lines in Table 3.8-4, Primary Instrument Line Penetrations.

Dresden Technical Administrative Requirements (DATR) Table 3/4.18.1(2), Dresden Unit 2(3) Primary Containment Isolation Valves, list the TIP ball valves, 733A-E, the TIP shear valves, 736-1-5 and the TIP purge checkvalve, 4799-514 as primary containment isolation valves. The penetration numbers listed in the DATR are consistent with UFSAR Table 6.2-9. The TIP purge solenoid valve, 4799-511 is not listed in DATR Table

3/4.18.1(2). Hence, checkvalve 4799-514 is the primary isolation valve for the TIP purge system.

The Dresden UFSAR section 7.3.2.4 states:

> "The logic for Groups 1, 2 and 5 primary isolation valves has been modified to prevent the valves from automatically opening when the isolation signal is reset. The margin of safety increases since it now requires an operator to individually open the valves."

Also, NUREG-0578, Lessons learned from TMI-2, states:

> "...the experience gained at TMI-2 indicates that the resetting of the containment isolation signal in some designs may result in automatic reopening of some containment isolation valves. Licensees should review their designs and correct this design error if it is found."

Modification M12-2(3)-79-40, Group II Primary Containment Isolation Valves for Units 2 and 3, was designed to require Group II valves to remain in the closed position after the isolation is reset. The TIP ball valves were not included in this modification.

Also, DOS 1600-7, Containment Isolation Valve Simulated Automatic Initiation and Logic Functional Test, test that Group II isolation valves remain closed after the isolation is reset. The DOS requires the operator to verify the TIPs retract and the ball valve closes. But, the conditions of the ball valve switches in open or the DCUs in forward are not specifically tested. Also, it does not mention the five minute delay. Thus, DOS 1600-7 does not test that the TIP ball valve isolation logic ensures the valves remain closed after resetting the isolation.

As result of the above information, Dresden Station determined the possibility of a degraded/unanalyzed condition regarding Primary Containment Isolation System (PCIS) discrepancies between UFSAR requirements and actual plant conditions existed and notified the NRC pursuant to 10CFR50.72(b)(1)(ii).

C. CAUSE OF EVENT:

This LER is being submitted voluntarily. The issue arises from the fact that the record does not adequately recognize that the TIP system had been excluded from consideration under the NUREG 0737 position. The UFSAR statement in section 7.3.2.4 apparently was not intended to include the TIP system. The following describes the events and related regulations and correspondences that lead to the current condition of the TIP ball valve logic:

After the Three Mile Island accident, the NRC issued several generic communications; IE Bulletin 79-08, IE Bulletin 80-06, NUREG 0578, and NUREG 0737 to the industry, requesting licensees to review a number of the issues that came out of the accident.

IEB 79-08, which was issued on April 14,1979, contained eleven items relating to the Three Mile Island accident. This included various items

related to Primary Containment Isolation. Based upon the existing documentation (both docketed submittals and internal ComEd documents) it appears that ComEd performed the requested review of existing containment penetrations at Dresden and Quad Cities, to ensure that those not needed for ECCS injection had a means of isolation, either automatic or manual. In addition, ComEd conducted a review of all systems designed to transfer potentially radioactive gases or liquids out of the primary containment to ensure that no undesired action would take place as a result of resetting ESF instrumentation.

As a result of these reviews, Dresden initiated a procedure change to address the Torus to Condenser drain line valves, and both stations initiated procedure changes to address their drywell sump discharge line and Drywell and Torus ventilation line valves. These procedure controls specified that isolation valves be placed in the closed position before manual reset is attempted.

In July of 1979, the NRC issued NUREG 0578, "TMI-2 Lesson Learned Task Force Status Report and Short Term Recommendations." In the section on Containment Isolation (2.1.4) there were four positions stated. Position # 4 states:

> "The design of control systems for automatic containment isolation valves shall be such that resetting the isolation signal will not result in the automatic reopening of containment isolation valves. Reopening of containment isolation valves shall require deliberate operator action."

ComEd responded to the NRC in a C. Reed to D.G. Eisenhut letter dated October 18, 1979. In that letter, ComEd stated that at both Dresden and Quad Cities:

> "...modifications will be made to the control circuitry for Group II containment isolation at Dresden Units 2 and 3 and Quad Cities to ensure reopening of Group II isolation valves requires deliberate operator action after resetting the isolation signal. In the interim, procedures have been established to require operator action to place the control switches in the closed position prior to reset of containment isolation. This modification will be installed by January 1, 1980."

In December of 1979, ComEd received a letter from General Electric which provided guidance on compliance with NUREG 0578 Item 2.1.4 - Containment Isolation. This document was sent to ComEd to address concerns raised at a BWR Owner's Group Meeting in November 1979. The document provided a generic approach to Item 2.1.4. This approach was based on a BWR Owner's Group approach and on discussions with other BWR owners. The report excludes the neutron monitor TIP lines as requiring a modification for containment isolation reset, as these valves are on a closed loop system. The GE document also described concerns which were raised by one BWR owner in relation to the generic approach to Item 2.1.4. The concern and GE's response on the TIP system reads:

"5. Concern

The TIP drive line isolation valves are not provided with direct, automatic isolation signals.

Response

The TIP system is a closed system with no direct interface with the reactor containment atmosphere. A failure of the TIP tubing would be required to breach the containment boundary. Remote manual isolation is available and no additional isolation is required."

A review of the GE document indicates that Concern 5 and the associated response was reviewed by ComEd personnel, and this review concluded that the TIP system did not need to be modified.

In December 1979, modifications M12-2(3)-79-40, Group II Primary Containment Isolation Valves for Units 2 and 3, were installed. These modifications fulfilled the requirement of NUREG 0578 position 4. Consistent with the conclusion reached after reviewing the GE letter, the TIP ball valves were not included in the modification.

At a meeting in Bethesda on February 15, 1980, between NRC and ComEd (Dresden and Quad), the NRC indicated that our isolation reset modification could result in failures that might preclude reopening of systems which might be useful post-accident. We agreed to investigate and modify as necessary. In addition, ComEd was asked to provide a list of penetrations, showing whether it was essential or non-essential and provide the isolation signal for each.

In March 1980, after reviewing the list of penetrations, the NRC concluded that ComEd satisfactorily met all NUREG 0578 Category "A" requirements for Dresden and Quad Cities.

The March 1980 letter further states:

> "We conclude that the licensee has completed a re-determination of which containment isolation penetrations are essential or non-essential. All non-essential lines are either automatically isolated by diverse signals or technical justification has been provided. Modifications have been made to prevent inadvertent re-opening of isolation valves. Based on the above, we find that the licensee has satisfied the requirements of this item."

On March 13, 1980, I.E. Bulletin 80-06 was issued. The bulletin required licenses to take actions including:

> "Verify ... by conduction a test to demonstrate that all equipment remains in its emergency mode upon removal of the actuating signal and/or manual resetting of the various isolating or actuation signals."

At that time a modification was in progress as a result of an April 30, 1979 event. During a Group II isolation on Dresden Unit 3 the 'C' TIP failed to retract as documented in deviation report D12-3-79-12. An

investigation revealed the isolation logic had been promptly reset by a NSO which discontinued the TIP withdrawal signal. Modification, M12-2(3)-80-51 added a time delay relay to the TIP withdrawal circuitry to assure complete withdrawal of a TIP even if a Group II isolation signal is immediately reset. This modification was designed to address the conditions of the deviation. Dresden felt it put the TIP circuitry in conformance with I.E. Bulletin 80-06. The modifications were installed in April and May of 1982. ComEd responded to IE Bulletin 80-06 in August 20, 1982 letter from D. Swartz to J. Keppler, which states:

> "Revised the TIP drive system circuitry to satisfy IE Bulletin 80-06 and 79-08 requirements."

The January 26, 1995 review revealed that the modification did not account for the conditions of the ball valve control switches in the open position or the TIP DCU mode switches in the forward position. Hence, the modification only partially fulfilled the position of IE Bulletin 80-06. Whether or not the TIP system was intended to be subject to the positions of IE Bulletin 80-06 is unclear.

In October of 1980, the NRC issued NUREG-0737, which collated all post-TMI positions into one document.

ComEd responded to NUREG-0737 on December 15,1980. In that response, ComEd stated:

> "that for item II.E.4.2, 'Containment Isolation Dependability,' both Dresden and Quad Cities Stations were in compliance with positions 1-4 (Position 4 addressed containment isolation reset)."

Based upon the review of the documents and correspondence concerning the TIP System isolation reset issue, including GE guidance, the following conclusions can be reached:

> It appears that, in 1979, ComEd reviewed the TIP System with respect to NUREG-0578 requirements, and concluded that the TIP system penetrations were instrument lines, and a closed loop system. ComEd upheld that view in regards to its response to NUREG-0737 in 1980. Therefore the system did not need to be considered for the Group II isolation reset modification.
>
> In 1982 Dresden stated it had met the requirements of IE Bulletins 79-08 and 80-06 with respect to the TIP system isolation. In retrospect, while there is current ambiguity regarding the isolation logic reset requirements for the TIP system, it was previously believed that the modifications performed in 1982 met the issues raised in the Bulletins despite our position that the TIP system was a closed loop, instrument system to which the isolation reset requirement did not apply.

In January 1981, Philadelphia Electric Company (PECO) transmitted a number of concerns to General Electric in regards to GE's position on NUREG-0578 issues. Concern 5.f in this letter addressed the TIP system ball valves.

PECO indicated that the TIP system ball valves might automatically reopen upon reset of the isolation logic. Also, PECO indicated that it was their understanding that GE agreed in a conference call (with their licensees), that the circuit of the purge and ball valves should be modified to prevent opening of the valves upon reset of the isolation logic.

In October of 1982, GE published NEDC-22253, "BWR Owners' Group Evaluation of Containment Concerns." In that document, GE provided the design basis for the TIP system. GE also stated that the existing TIP system design is adequate for containment isolation provided that, among other things, the logic is modified to prevent reopening upon reset of the isolation signal. GE further states the TIP system should be considered an open system because relief valves on the indexers will open during a containment pressurizing event. Consequently, GDC 56 is the applicable NRC requirement for TIP system isolation design. GDC 56 allows deviation from the stated isolation requirement when the design is justified on "some other defined basis," such as instrument lines. The TIP system lines can be considered instrument lines because they function as instrument lines and they are small diameter lines per Regulatory Guide 1.11.

Dresden's actions and response to NEDC 22253 are unknown. Dresden does not consider this report to be part of its licensing document basis. Dresden does agree with the assertion that the TIP lines are instrument lines and, as such, the system is in compliance with our licensing basis.

In conclusion, a review of the record indicates that the licensing basis for this issue is unclear regarding the applicability of NUREG 0578 and 0737 positions to the TIP system. While the safety consequences of the current design are minimal, we have concluded that the prudent action is to modify the design to preclude automatic reopening of the TIP ball valve following reset of a Group II isolation signal.

D. SAFETY ANALYSIS:

The safety consequence of this event is minimal.

The primary containment isolation valves are required to automatically close upon receipt of an isolation signal for Group II PCIS. The process conditions (setpoints) for this isolation are:

1. Low Rx Water Level (8")
2. High Drywell Pressure (2#)
3. High Containment Radiation (100R)

The isolation function is not challenged by the current state of the TIP system logic. This condition does not affect the ability of the containment isolation valves to isolate upon receipt of a valid isolation signal. This condition will allow containment isolation valves to automatically reopen upon reset of the group II isolation signal if the ball valve control switches are left in the open position or the DCU is left in the forward position. This condition is only expected to take place if TIP runs were in place at the time the valid isolation signal is received and the Operator at the Main control board resets the PCIS isolation prior to the TIP Operator getting the ball valve control

switches into the CLOSE position and turning off power to the DCU's. The five minute time delay would allow sufficient time for the automatic withdraw of the TIP detector to its in-shield position The TIP operator will be working in a controlled environment, with minimal challenge to his ability to either recognize the need for his manual actions, or to complete them.

The TIP lines have manually actuated shear valves that will provide this isolation should the other TIP equipment or interlocks fail. The basis for these shear valves, the information needed by the operator to recognize the need to actuate them, and the actuation and results are not impacted by this issue or the compensatory actions being implemented.

Third, a PRA Analysis performed in response to this event estimates the probability of TIP system containment leakage following damage event as approximately three orders of magnitude less than the non risk significant criterion.

Hence, the impact of this event is negligible.

E. CORRECTIVE ACTIONS:

Immediate corrective actions included administrative controls to assure the TIP ball valve control switches are placed in the closed position, all TIPs verified in shield and the Directional Control Unit (DCU) mode switch placed to off before resetting an isolation. These administrative controls will continue until completion of procedure changes. A Training Request form has also been submitted concerning future further training on this topic.

Additionally a circuit modification has been initiated on Unit 2 and 3 to provide the TIP system logic to preclude automatic reopening of the TIP ball valve following reset of a Group II isolation signal without subsequent operator action.

F. PREVIOUS OCCURRENCES:

Deviation D12-3-79-12, Upon Reactor Scram, 'C' TIP machine did not withdraw fully into shield from Group II isolation.

G. COMPONENT FAILURE DATA:

There were no component failures associated with this event.