William T. O'Connor, Jr.
Vice President, Nuclear Generation

Fermi 2
6400 North Dixie Hwy., Newport, Michigan 48166
Tel: 734-586-5201 Fax: 734-586-4172

DTE Energy

10 CFR 50.90

March 17, 2005
NRC-05-0016

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) Detroit Edison Letter to NRC "Proposed License Amendment to Revise Technical Specification 3.3.6.1, "Primary Containment Isolation Instrumentation,"" NRC-04-0006, dated March 19, 2004.

Subject: Revision to License Amendment Request to Revise Technical Specification 3.3.6.1, "Primary Containment Isolation Instrumentation"

Pursuant to 10 CFR 50.90, Detroit Edison hereby requests the following amendment. This submittal replaces Reference 2 in its entirety and provides additional technical information on the Fermi 2 RWCU Leakage Detection System design. Additionally, insight gained from a Duane Arnold Energy Center Technical Specification (TS) has been utilized in this submittal.

The proposed change would address an inconsistency that was inadvertently introduced during conversion to Improved Technical Specifications by replacing "1 per room" with "2" for the Required Channels Per Trip System for the Reactor Water Cleanup Area Ventilation Differential Temperature - High primary containment isolation instrumentation. This inaccuracy in the Technical Specifications was introduced during the change to the Improved Standard Technical Specifications (ISTS).

Detroit Edison requests approval of the proposed License Amendment by March 18, 2006, with the amendment being implemented within 90 days following approval.

Enclosure 1 contains an evaluation, including a significant hazards consideration, of the proposed change. Enclosure 2 contains a copy of the existing Technical Specification (TS) page marked up to show the proposed change. Enclosure 3 contains a copy of the proposed revised TS page. Enclosure 4 provides marked up pages of the existing TS Bases showing the proposed changes (for information only). There are no new regulatory commitments associated with this proposed change.

Detroit Edison has reviewed the proposed change against the criteria of 10 CFR 51.22 for environmental considerations. The proposed amendment is confined to 10 CFR 51.22(c)(10)(ii) involving record keeping, reporting, or administrative procedures or requirements. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(10). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment needs to be prepared in connection with the proposed amendment.

In accordance with 10 CFR 50.91, a copy of this application, with enclosures, is being provided to the designated Michigan Official.

If you have any questions regarding this submittal, please contact Norman K. Peterson at (734) 586-4258.

Sincerely,

W. T. O'Connor, Jr.
Vice President – Nuclear Generation

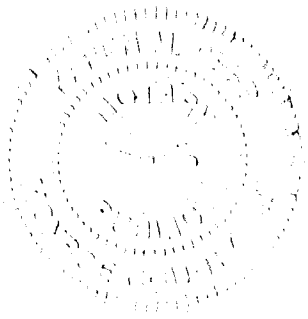
Enclosures:
1. Fermi 2 Nuclear Power Plant Evaluation for License Amendment Request
2. Proposed Technical Specification Change (Mark-Up)
3. Proposed Technical Specification Revised Page
4. Marked up pages of the existing TS Bases showing the proposed changes (for information only).

cc: E. R. Duncan
N. K. Ray
NRC Resident Office
Regional Administrator, Region III
Supervisor, Electric Operators,
Michigan Public Service Commission

I, WILLIAM T. O'CONNOR, JR., 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.

WILLIAM T. O'CONNOR, JR.
Vice President - Nuclear Generation

On this 17th day of March, 2005 before me personally appeared William T. O'Connor, Jr., being first duly sworn and says that he executed the foregoing as his free act and deed.



Notary Public

KAREN M. REED
Notary Public, Monroe County, MI
My Commission Expires 09/02/2005

bcc: G. D. Cerullo
D. K. Cobb
W. A. Colonnello
R. W. Libra
W. T. O'Connor, Jr.
N. K. Peterson
M. A. Philippon
P. W. Smith
S. Stasek

Electronic Licensing Library (ELL) (200 TAC)
Information Management (140 NOC)
Michigan Department of Environmental Quality
Hazardous Waste and Radiological Protection Section
NSRG Administrator (200 TAC)
NRR Chron File
E. F. Kokosky
D. J. Noetzel

ENCLOSURE 1 to
NRC-05-0016

FERMI 2 NUCLEAR POWER PLANT

EVALUATION FOR LICENSE AMENDMENT REQUEST

FERMI 2 NUCLEAR POWER PLANT

EVALUATION

SUBJECT: Revise Technical Specification (TS) 3.3.6.1, Primary Containment Isolation Instrumentation.

1.0 DESCRIPTION:

The proposed change would:

- Replace "1 per area" with "1 per area (d)" for the Required Channels Per Trip System for the Reactor Water Cleanup (RWCU) Area Temperature - High isolation, Function 5.b of Table 3.3.6.1-1 of Technical Specification (TS) 3.3.6.1, Primary Containment Isolation Instrumentation.

- Replace "1 per room" with "2 (d)" for the Required Channels Per Trip System for the Reactor Water Cleanup (RWCU) Area Ventilation Differential Temperature - High isolation, Function 5.c of Table 3.3.6.1-1 of Technical Specification (TS) 3.3.6.1, Primary Containment Isolation Instrumentation.

- Add note (d) to TS Table 3.3.6.1-1, Primary Containment Isolation Instrumentation, explaining that for the North and South RWCU Pump Rooms, the RWCU Heat Exchanger Room, and the RWCU Phase Separator Room, each trip system must have either an Operable Function 5.b channel or an Operable Function 5.c channel.

As a result of the change inadvertently introduced during the conversion to Improved Technical Specifications (ITS), the actions specified by TS 3.3.6.1, Primary Containment Isolation Instrumentation, for RWCU Area Ventilation Differential Temperature – High, are inconsistent with other RWCU isolation instruments listed in Table 3.3.6.1-1. Administrative controls have been put in place using the guidance provided in NRC Administrative Letter 98-10, "Dispositioning Of Technical Specifications That Are Insufficient To Assure Plant Safety." The administrative controls ensure that actions consistent with the intent of TS 3.3.6.1 will be taken until implementation of this amendment request.

2.0 PROPOSED CHANGE:

The proposed change would restore the pre-ITS value of "2" for the Required Channels Per Trip System for the RWCU Area Ventilation Differential Temperature - High on Table 3.3.6.1-1 of TS 3.3.6.1, Primary Containment Isolation Instrumentation. Additionally, a note is added to Table 3.3.6.1-1 of TS 3.3.6.1, Primary Containment Isolation Instrumentation, that ensures during surveillance testing and normal operation, there will always be at least one instrument monitoring for a small leak in all RWCU locations. This proposed change will make Table 3.3.6.1-1 of TS 3.3.6.1, Primary Containment Isolation Instrumentation, accurately reflect the installed instrumentation.

3.0 BACKGROUND:

The RWCU system is classified as a power conversion subsystem and is designed to 1) maintain the reactor coolant chemistry within TS limits; 2) conserve thermal energy during removal and return of reactor coolant to the pressure vessel; 3) remove excess reactor coolant during various operational phases; 4) serve, in part, as a reactor coolant pressure boundary; and 5) provide a containment isolation function. Only the latter two functions are directly related to safety.

The major RWCU system equipment is located within the secondary containment and external to the primary containment. Because the system processes high energy and high activity coolant, the system components are located in shielded, separated rooms or areas. Each area is ventilated by the Reactor Building Heating, Ventilation and Air Conditioning (RBHVAC) system whose discharge is through radiation monitored reactor building ventilation stack. The ventilation stack is automatically isolated by a high radiation signal.

The RWCU system is designed for continuous, controlled removal of reactor coolant from the reactor recirculation system piping. The RWCU system inlet connects to both the reactor recirculation system piping and the bottom of the reactor vessel. After passing through an inboard and outboard primary containment isolation valve, suction flow is driven by parallel motor driven pumps which discharge to the regenerative heat exchangers. From there the flow is routed to the nonregenerative heat exchangers, and parallel filter demineralizers. It is returned to the feedwater piping via the shell side of the regenerative heat exchangers, a motor-operated primary containment isolation valve, and check valves.

Automatic isolation of the RWCU system is provided to meet the safety related requirements for primary containment isolation. The two RWCU suction isolation valves and one RWCU return isolation valve are closed on signal from the Primary Containment Isolation System (PCIS), which are triggered by reactor water level (level 2). During an accident, closure of these valves assures that 1) primary coolant pressure boundary is maintained and losses of reactor coolant are limited; and 2) the release of radioactivity from the primary containment is limited.

Additional automatic isolation capability is provided as non-safety related, and serves to limit RWCU system leakage of radioactive reactor coolant outside the primary containment. This in turn limits local contamination, and high radiation and high temperature environments in equipment areas (Reference 4). These include isolations on Differential Flow - High, Area Temperature - High, and Area Ventilation Differential Temperature – High. Although not specifically required by NRC regulations, the differential temperature monitoring was originally recommended for relatively small leak detection in small volume compartments.

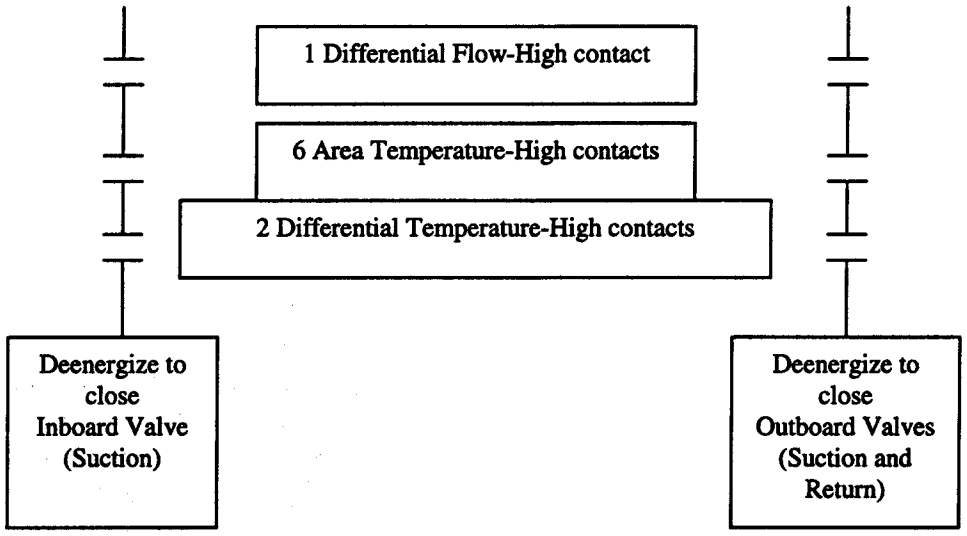
The RWCU isolation logic at Fermi 2 is designed to meet IEEE Std 279-1971, "Criteria for Protection Systems for Nuclear Power Stations." The degree of Conformance to IEEE-279-1971 is described in Topical Report NEDO-10139, "Compliance of Protection Systems to Industry Criteria: General Electric BWR Nuclear Steam Supply System."

In NEDO-10139, Figure 4-13, the Functional Control Diagram for the RWCU System shows the isolation control logic. The figure differentiates between the safeguards and non-safeguards inputs for isolation signals. Reactor Low Water Level is a safeguards input designated Signal Code 8 and uses a fail safe one-out-of-two-taken-twice logic. The non-safeguards inputs are Standby Liquid Control (SLC) initiation (no Signal Code specified), and the RWCU System Area Temperature - High, Area Ventilation Differential Temperature – High, and RWCU Differential Flow – High, designated Signal Code 1. For Signal Code 1, combining of the three different Leakage Detection System (LDS) signals is done by redundant relay logic on valve control circuits for each isolation valve. Per NEDO-10139, Section 4.1.2.1, this is so a single signal failure or a single trip logic failure can be tolerated without loss of the isolation function. The Area Temperature – High and Area Ventilation Differential Temperature – High signals work in tandem to initiate containment isolation and are not required to be redundant for each isolation valve.

At Fermi 2, the RWCU LDS consists of the RWCU system isolations on Differential Flow - High, Area Temperature - High, and Area Ventilation Differential Temperature – High. The temperature based RWCU LDS is designed based on an assumed leakage equivalent to the allowable leakage inside containment as established in the TSs (Reference 4). The combining of the three RWCU LDS signals is done by a redundant relay logic on valve control circuits for each of the isolation valves. The isolation logic deenergizes to operate. Exceeding differential flow or any area temperature or any area ventilation differential temperature causes isolation of the RWCU system.

Summary of RWCU LDS Relay Logic

Inboard and Outboard isolation valves each have a total of 8 temperature isolations and one differential flow isolation. All three leak detection signals are combined into two redundant, deenergize to trip (fail safe) isolation logics. An isolation of the RWCU system can be accomplished by actuation of either trip system logic.



Summary of RWCU Isolation Logic

RWCU Isolation Signal	Safeguards	Non-Safeguards	Isolation
Water Level Low	X		Sensors (channels) and relay logic are redundant
SLC		X	Isolates only 1 valve (outboard), no redundancy
LDS		X	Sensors (channels) are non-redundant, Relay logic is redundant

The Area Temperature - High channels are located in six areas with two detectors in each area. One of the two detectors is part of the inboard valve isolation logic and one is part of the outboard valve isolation logic. Actuation of either inboard or outboard isolation logic is sufficient to isolate the RWCU system. High temperature in a single area will cause both the inboard and outboard isolation valves to close by actuating both detection channels for that area.

The Area Ventilation Differential Temperature – High channels are located in four rooms with one detector in each room. Two rooms are part of the inboard isolation logic and two rooms are part of the outboard isolation logic. A high differential temperature in a single room will cause either the RWCU isolation inboard valve or outboard valves to close.

Both the RWCU Area Ventilation Differential Temperature – High and the RWCU Area Temperature - High primary containment isolation instrumentation are provided to detect a leak from the RWCU system. The RWCU Area Ventilation Differential Temperature - High and RWCU Area Temperature - High isolation signals are redundant and diverse to the high differential flow instrumentation for the hot portions of the RWCU system.

Twelve thermocouples provide input to the RWCU Area Temperature – High Function (two per area). Eight thermocouples provide input to the RWCU Area Ventilation Differential Temperature – High Function. Two thermocouples are required for each differential temperature channel, one each in the inlet and outlet of the room cooling systems, for a total of four channels (one channel per room). Fermi 2 RWCU Area Ventilation Differential Temperature - High instrumentation is non-redundant at the channel level due to having one channel per room.

Fermi 2 has diversity in its RWCU temperature isolation instrumentation in that Area Ventilation Differential Temperature – High and the RWCU Area Temperature – High monitor for a small leak in the same rooms. The reliability of the RWCU system isolation function remains high even in the presence of single or multiple failures of differential temperature channels because of redundancy and diversity of the LDS. A steam leak will cause a coincidental trip of both the differential and ambient temperature channels in the same area.

LDS Isolation Sensor (Channel) Comparison

RWCU Spaces	RWCU A Pump Room (North)	RWCU B Pump Room (South)	RWCU HX Room	RWCU Phase Sep Room	Torus Room Area	Trench Piping Area	Total Sensors (Channels)
No. of Temperature-High Channels	2	2	2	2	2	2	12
Isolation signal to:	Inboard & Outboard	Inboard & Outboard	Inboard & Outboard	Inboard & Outboard	Inboard & Outboard	Inboard & Outboard	
No. of Ventilation Differential Temperature-High Channels	1	1	1	1	0	0	4
Isolation signal to:	Inboard	Outboard	Inboard	Outboard			

Summary of RWCU LDS Isolation Signal Redundancy

RWCU LDS Signal	Total Available Channels	Number of areas or rooms covered	Redundant relay logic
Area Temperature – High	12	6	2 (1 inboard, 1 outboard)
Area Ventilation Differential Temperature – High	4	4	2 (1 inboard, 1 outboard)
Differential Flow – High	1	All	2 (1 inboard, 1 outboard)

TS Amendment No. 134, which implemented the Improved Standard Technical Specifications (ISTS), incorrectly re-formatted the "2" (Minimum Operable Channels Per Trip System) to "1 per room" (Required Channels Per Trip System) for this function. This change was incorrect

because Fermi's accepted design is four channels (one channel per room) for RWCU Area Ventilation Differential Temperature – High.

4.0 TECHNICAL ANALYSIS:

The proposed license amendment restores "2" as the number of Required Channels Per Trip System for the RWCU Area Ventilation Differential Temperature - High isolation, Function 5.c of Table 3.3.6.1-1 of TS 3.3.6.1, Primary Containment Isolation Instrumentation.

The proposed license amendment adds note (d) to Table 3.3.6.1-1 of TS 3.3.6.1, Primary Containment Isolation Instrumentation, which allows, for the North and South RWCU Pump Rooms, the RWCU Heat Exchanger Room, and the RWCU Phase Separator Room, each trip system to have as a minimum requirement, either an Operable Function 5.b (RWCU Area Temperature - High) channel or an Operable Function 5.c (RWCU Area Ventilation Differential Temperature - High) channel. The addition of this note ensures isolation capability for small leaks in these areas will be maintained during surveillance testing and normal operation.

The change that prompted this proposed license amendment was introduced during TS Amendment No. 134, which implemented the ITS (TAC NO. MA1465). In Table A, Administrative Changes to Current Technical Specifications, of the NRC Safety Evaluation (ITS Section 3.3.6.1, A.13), the change from "2" to "1 per room" was described as an administrative change to better specify the number of channels for each trip system. This change was made to match the nomenclature used in the NRC Improved Standard Technical Specifications (ISTS) and to specify the number of instruments per room.

The Fermi 2 TS Bases for the RWCU Area Ventilation Differential Temperature - High isolation Function were revised during conversion to ITS. The changes were made to reflect the plant specific instrumentation at Fermi. The bases acknowledge that there are a total of four Area Differential Temperature - High monitors for RWCU, one per room.

The Fermi 2 design for the RWCU Area Ventilation Differential Temperature - High isolation Function does not match the design used in the NRC ISTS and this change to the number of Required Channels Per Trip System should not have been made. Fermi 2 is designed with one differential temperature monitor per room as opposed to the NRC ISTS format of two differential temperature monitors per room. The Fermi 2 design for the RWCU Area Ventilation Differential Temperature - High isolation Function is described in a License Amendment Request (Reference 3) dated December 22, 1988, subsequently issued to Fermi as TS Amendment No. 41 (TAC NO. 72759).

TS Amendment No. 41 revised the RWCU Area Temperature – High isolation instrumentation by adding a second instrument to all areas monitored. This plant modification provided redundancy for the RWCU Area Temperature – High isolation Function in order to be used as isolation for a RWCU High Energy Line Break scenario. Prior to this, the RWCU Area

Temperature – High isolation Function was one instrument per area, similar to the RWCU Area Ventilation Differential Temperature – High instruments.

The proposed change to "2" Required Channels Per Trip System acknowledges that the Fermi 2 design has 4 RWCU Area Ventilation Differential Temperature - High instruments. The addition of note (d) clarifies the requirement to maintain isolation capability during surveillance testing and normal operation.

In summary, the proposed change to the Required Channels Per Trip System and addition of note (d) to the RWCU Area Temperature - High, Function 5.b, and RWCU Area Ventilation Differential Temperature - High isolation, Function 5.c, of Table 3.3.6.1-1 of TS 3.3.6.1, Primary Containment Isolation Instrumentation, restores the TS to be consistent with Fermi 2 design and ensures redundant channels in all RWCU locations in order to maintain isolation capability during surveillance testing and normal operation.

5.0 REGULATORY ANALYSIS:

5.1 No Significant Hazards Consideration

Detroit Edison has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as described below:

1. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No.

   The proposed change restores the number of Required Channels Per Trip System of the RWCU Area Ventilation Differential Temperature - High isolation, Function 5.c of Table 3.3.6.1-1 of TS 3.3.6.1, Primary Containment Isolation Instrumentation, to its pre-ITS value and adds a note to Table 3.3.6.1-1 of TS 3.3.6.1, Primary Containment Isolation Instrumentation, that ensures, during surveillance testing and normal operation, there will always be at least one instrument monitoring for a small leak in all RWCU locations. No changes in operating practices or physical plant equipment are created as a result of this change. Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different type of accident from any accident previously evaluated?

Response: No.

The proposed change restores the number of Required Channels Per Trip System of the RWCU Area Ventilation Differential Temperature - High isolation, Function 5.c of Table 3.3.6.1-1 of TS 3.3.6.1, Primary Containment Isolation Instrumentation, to its pre-ITS value and adds a note to Table 3.3.6.1-1 of TS 3.3.6.1, Primary Containment Isolation Instrumentation, that ensures, during surveillance testing and normal operation, there will always be at least one instrument monitoring for a small leak in all RWCU locations. No physical change in plant equipment will result from this proposed change. Therefore, the proposed change does not create the possibility of a new or different type of accident from any previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No.

The proposed change restores the number of Required Channels Per Trip System of the RWCU Area Ventilation Differential Temperature - High isolation, Function 5.c of Table 3.3.6.1-1 of TS 3.3.6.1, Primary Containment Isolation Instrumentation, to its pre-ITS value and adds a note to Table 3.3.6.1-1 of TS 3.3.6.1, Primary Containment Isolation Instrumentation, that ensures, during surveillance testing and normal operation, there will always be at least one instrument monitoring for a small leak in all RWCU locations. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

5.2 Applicable Regulatory Requirements / Criteria

The proposed change addresses an inconsistency that was inadvertently introduced during implementation of the ITS by restoring the required number of trip channels previously approved and is judged to have no impact on regulatory requirements or regulatory criteria. The proposed license amendment also adds note (d) to Table 3.3.6.1-1 of TS 3.3.6.1, Primary Containment Isolation Instrumentation, which allows, for the North and South RWCU Pump Rooms, the RWCU Heat Exchanger Room, and the RWCU Phase Separator Room, each trip system to have as a minimum requirement, either an Operable Function 5.b (RWCU Area Temperature - High) channel or an Operable Function 5.c (RWCU Area Ventilation Differential Temperature - High) channel. The addition of this

note ensures isolation capability for small leaks in these areas will be maintained during surveillance testing and normal operation.

This change to the Technical Specifications is similar to a NRC approved change to the Duane Arnold Energy Center (DAEC) Technical Specifications Amendment 223, as part of conversion to the ITS. Similar content is being proposed in this amendment request. In DAEC TS Amendment 223, a note is used for the RWCU pump area and RWCU heat exchanger area. The note allows use of the Area Temperature-High and Area Ventilation Differential Temperature-High functions in order to maintain coverage in both areas. The DAEC design is similar to Fermi 2 in that the Area Temperature-High and Area Ventilation Differential Temperature-High channels are configured so that any one input will trip the associated trip system. Each of the two trip systems is connected to either an inboard valve or an outboard valve.

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not adversely affect the common defense and security or the health and safety of the public.

6.0 ENVIRONMENTAL CONSIDERATION:

The proposed amendment is confined to 10 CFR 51.22(c)(10)(ii), changes involving record keeping, reporting, or administrative procedures or requirements. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(10). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment needs to be prepared in connection with the proposed amendment.

7.0 REFERENCES:

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

2. Detroit Edison Letter to NRC "Proposed License Amendment to Revise Technical Specification 3.3.6.1, "Primary Containment Isolation Instrumentation," NRC-04-0006, dated March 19, 2004.

3. Letter to NRC: NRC-88-0279, "Proposed Technical Specification Change (License Amendment) – Isolation Actuation Instrumentation (3/4.3.2)," dated December 22, 1988.

4. AEOD/NRC Engineering Evaluation Report, "RWCU System Automatic Isolation and Safety Considerations (AEOD/E705)," dated March 1987.

5. Amendment 223 to Facility Operating License No. DPR-49, Duane Arnold Energy Center (TAC No. M97197).

ENCLOSURE 2 to
NRC-05-0016

PROPOSED TECHNICAL SPECIFICATION CHANGE (MARK-UP)

INCLUDED PAGE:

TS 3.3-58

Table 3.3.6.1-1 (page 4 of 4)
Primary Containment Isolation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
5. Reactor Water Cleanup (RWCU) System Isolation					
a. Differential Flow – High	1.2.3	1	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.5	≤ 63.4 gpm
b. Area Temperature – High	1.2.3	1 per area (d)	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.5	≤ 183°F
c. Area Ventilation Differential Temperature – High	1.2.3	~~1 per room~~ 2 (d)	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.5	≤ 53°F
d. SLC System Initiation	1.2	2(b)	I	SR 3.3.6.1.5	NA
e. Reactor Vessel Water Level – Low Low, Level 2	1.2.3	2	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.5	≥ 103.8 inches
f. Manual Initiation	1.2.3	1 per valve	G	SR 3.3.6.1.6	NA
6. Shutdown Cooling System Isolation					
a. Reactor Steam Dome Pressure – High	1.2.3	1	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.5	≤ 95.5 psig
b. Reactor Vessel Water Level – Low, Level 3	3.4.5	2(c)	J	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.5	≥ 171.9 inches
c. Manual Initiation	1.2.3	1 per valve	G	SR 3.3.6.1.6	NA

(b) SLC System Initiation only inputs into one of the two trip systems.

(c) Only one trip system required in MODES 4 and 5 when RHR Shutdown Cooling System integrity maintained.

add

(d) For the N and S RWCU Pump Rooms, the RWCU Heat Exchanger Room, and the RWCU Phase Separator Room, each trip system must have either an OPERABLE Function 5.b channel or an OPERABLE Function 5.c channel.

ENCLOSURE 3 to
NRC-05-0016

PROPOSED TECHNICAL SPECIFICATION REVISED PAGE

INCLUDED PAGE:

TS 3.3-58

Table 3.3.6.1-1 (page 4 of 4)
Primary Containment Isolation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
5. Reactor Water Cleanup (RWCU) System Isolation					
a. Differential Flow – High	1,2,3	1	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.5	≤ 63.4 gpm
b. Area Temperature – High	1,2,3	1 per[(d)] area	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.5	≤ 183°F
c. Area Ventilation Differential Temperature – High	1,2,3	2[(d)]	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.5	≤ 53°F
d. SLC System Initiation	1,2	2[(b)]	I	SR 3.3.6.1.5	NA
e. Reactor Vessel Water Level – Low Low, Level 2	1,2,3	2	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.5	≥ 103.8 inches
f. Manual Initiation	1,2,3	1 per valve	G	SR 3.3.6.1.6	NA
6. Shutdown Cooling System Isolation					
a. Reactor Steam Dome Pressure – High	1,2,3	1	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.5	≤ 95.5 psig
b. Reactor Vessel Water Level – Low, Level 3	3,4,5	2(c)	J	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.5	≥ 171.9 inches
c. Manual Initiation	1,2,3	1 per valve	G	SR 3.3.6.1.6	NA

(b) SLC System Initiation only inputs into one of the two trip systems.

(c) Only one trip system required in MODES 4 and 5 when RHR Shutdown Cooling System integrity maintained.

(d) For the N and S RWCU Pump Rooms, the RWCU Heat Exchanger Room, and the RWCU Phase Separator Room, each trip system must have either an OPERABLE Function 5.b channel or an OPERABLE Function 5.c channel.

ENCLOSURE 4 to
NRC-05-0016

PROPOSED TECHNICAL SPECIFICATION BASES CHANGES
(FOR INFORMATION ONLY)

INCLUDED PAGES:

B 3.3.6.1- 1
B 3.3.6.1- 4
B 3.3.6.1-19
B 3.3.6.1-24
B 3.3.6.1-25
B 3.3.6.1-32

B 3.3 INSTRUMENTATION

B 3.3.6.1 Primary Containment Isolation Instrumentation

BASES

BACKGROUND

The primary containment isolation instrumentation automatically initiates closure of appropriate primary containment isolation valves (PCIVs). The function of the PCIVs, in combination with other accident mitigation systems, is to limit fission product release during and following postulated Design Basis Accidents (DBAs). Primary containment isolation within the time limits specified for those isolation valves designed to close automatically ensures that the release of radioactive material to the environment will be consistent with the assumptions used in the analyses for a DBA.

The isolation instrumentation includes the sensors, relays, and switches that are necessary to cause initiation of primary containment and reactor coolant pressure boundary (RCPB) isolation. Most channels include electronic equipment (e.g., trip units) that compares measured input signals with pre-established setpoints. When the setpoint is exceeded, the channel output relay actuates, which then outputs a primary containment isolation signal to the isolation logic. Functional diversity is provided by monitoring a wide range of independent parameters. The input parameters to the isolation logics are (a) reactor vessel water level, (b) area ambient and differential temperatures, (c) main steam line (MSL) flow and radiation, (d) Standby Liquid Control (SLC) System initiation, (e) condenser pressure, (f) main steam line pressure, (g) high pressure coolant injection (HPCI) and reactor core isolation cooling (RCIC) steam line flow, (h) drywell pressure, (i) HPCI and RCIC steam line pressure, (j) HPCI and RCIC turbine exhaust diaphragm pressure, (k) reactor water cleanup (RWCU) differential flow, and (l) reactor steam dome pressure. Redundant sensor input signals from each parameter are typically provided for initiation of isolation. The only exceptions are SLC System initiation and RWCU differential flow. In addition, manual isolation of the valves is provided.

Primary containment isolation instrumentation has inputs to the trip logic of the isolation functions listed below.

, RWCU differential temperature

insert

BASES

BACKGROUND (continued)

and Drywell Pressure – High Functions. These Functions receive inputs from four turbine exhaust diaphragm pressure and four steam supply pressure channels for each system. The outputs from the turbine exhaust diaphragm pressure and steam supply pressure channels are each connected to two two-out-of-two trip systems. Each trip system isolates one valve per associated penetration.

HPCI and RCIC Functions isolate the HPCI and RCIC isolation valves.

5. Reactor Water Cleanup System Isolation

The Reactor Vessel Water Level – Low Low, Level 2 Isolation Function receives input from four reactor vessel water level channels. The outputs from the reactor vessel water level channels are connected into two two-out-of-two trip systems.

The Differential Flow – High function is derived from three non-redundant flow transmitters and a non-redundant flow summer. The output of the summer is fed to two trip units, the outputs of which are channeled through relays into two trip systems. One trip system isolates the inboard isolation valve, while the other trip system isolates the two outboard isolation valves.

SLC System Initiation Functions receive input from two channels, with each channel in one trip system using a one-out-of-one logic. Both channels are only input to the trip systems that isolates the outboard isolation valves.

The Area Temperature – High Function receives input from twelve temperature monitors, six to each trip system. The Area Ventilation Differential Temperature – High Function receives input from four differential temperature monitors, two in each trip system. These are configured so that any one input will trip the associated trip system. One of the two trip systems is connected to the inboard valve and the other trip system is connected to the two outboard valves on each RWCU penetration.

insert 1

RWCU Functions isolate the RWCU isolation valves.

Insert 1

The Area Temperature—High and Area Ventilation Differential Temperature—High Function act together to provide protection from small leaks in the monitored areas and rooms of the RWCU system.

Area Ventilation Differential Temperature-High

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Area Temperature-High

The Differential Flow-High Allowable Value ensures that a break of the RWCU piping is detected.

This Function isolates the RWCU isolation valves.

5.b., 5.c. Area and Area Ventilation Differential Temperature-High

Differential Flow-High

RWCU ~~area~~ and ~~area ventilation differential temperatures~~ are provided to detect a leak from the RWCU System. The ~~isolation~~ occurs even when very small leaks have occurred and is diverse to the ~~high differential flow~~ instrumentation for the hot portions of the RWCU System. If the small leak continues without isolation, offsite dose limits may be reached. Credit for these instruments is not taken in any transient or accident analysis in the UFSAR, since bounding analyses are performed for large breaks such as recirculation or MSL breaks.

, six areas

~~Area~~ and ~~area ventilation differential temperature~~ signals are initiated from temperature elements that are located in the ~~area~~ or room that is being monitored. Twelve thermocouples provide input to the Area Temperature-High Function (two per ~~area~~). Two channels per area are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.

insert

Eight thermocouples provide input to the Area Ventilation Differential Temperature-High Function. The output of these thermocouples is used to determine the differential temperature in four rooms containing RWCU piping and equipment. Each channel consists of a differential temperature instrument that receives inputs from ~~thermocouples~~ that are located in the inlet and outlet of the room ~~cooling~~ system and for a total of four available channels (one per ~~room~~).

, four rooms

The Area and Area Ventilation Differential Temperature-High Allowable Values are set low enough to detect a leak equivalent to 25 gpm.

These Functions isolate the RWCU isolation valves, as appropriate.

BASES

ACTIONS (continued)

Condition. However, the Required Actions for inoperable primary containment isolation instrumentation channels provide appropriate compensatory measures for separate inoperable channels. As such, a Note has been provided that allows separate Condition entry for each inoperable primary containment isolation instrumentation channel.

A.1

Because of the diversity of sensors available to provide isolation signals and the redundancy of the isolation design, an allowable out of service time of 12 hours for Functions 1.f, 2.a, 2.c, and 6.b and 24 hours for Functions other than Functions 1.f, 2.a, 2.c, and 6.b has been shown to be acceptable (Refs. 5 and 6) to permit restoration of any inoperable channel to OPERABLE status. This out of service time is only acceptable provided the associated Function is still maintaining isolation capability (refer to Required Action B.1 Bases). If the inoperable channel cannot be restored to OPERABLE status within the allowable out of service time, the channel must be placed in the tripped condition per Required Action A.1. Placing the inoperable channel in trip would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue with no further restrictions. Alternately, if it is not desired to place the channel in trip (e.g., as in the case where placing the inoperable channel in trip would result in an isolation), Condition C must be entered and its Required Action taken. ~~As an administrative control (reference 12) with one or more RWCU Area Ventilation Differential Temperature High instruments inoperable TS 3.3.6.1, Condition B.1 should be entered.~~

B.1

Required Action B.1 is intended to ensure that appropriate actions are taken if multiple, inoperable, untripped channels within the same Function result in redundant automatic isolation capability being lost for the associated penetration flow path(s). The MSL Isolation Functions are considered to be maintaining isolation capability when sufficient channels are OPERABLE or in trip, such that both trip systems will generate a trip signal from the given Function on a valid signal. The other isolation functions are considered to be maintaining isolation capability when sufficient channels are OPERABLE or in trip, such that one

BASES

ACTIONS (continued)

trip system will generate a trip signal from the given Function on a valid signal. This ensures that one of the two PCIVs in the associated penetration flow path can receive an isolation signal from the given Function. For Functions 1.a, 1.b, 1.d, and 1.f, this would require both trip systems to have one channel OPERABLE or in trip. For Function 1.c, this would require both trip systems to have one channel, associated with each MSL, OPERABLE or in trip. For Functions 1.e and 1.g, each Function consists of ~~channels that monitor several locations within a given~~ area (e.g., different locations within the main steam tunnel area). Therefore, this would require both trip systems to have one channel per location OPERABLE or in trip. For Functions 2.a, 2.b, 2.c, 3.b, 3.c, 4.b, 4.c, 5.e, and 6.b, this would require one trip system to have two channels, each OPERABLE or in trip. For Functions 3.a, 3.d, 4.a, 4.d, 5.a, 5.d, and 6.a, this would require one trip system to have one channel OPERABLE or in trip. ~~For Functions 5.b and 5.c, each Function consists of channels that monitor several different locations. Therefore, this would require one channel per location to be OPERABLE or in trip (the channels are not required to be in the same trip system).~~ The Condition does not include the Manual Initiation Functions (Functions 1.h, 2.d, 3.f, 4.f, 5.f, and 6.c), since they are not assumed in any accident or transient analysis. Thus, a total loss of manual initiation capability for 24 hours (as allowed by Required Action A.1) is allowed. ~~As an administrative control (reference 12) Condition B.1 is to be used for an inoperable RWCU Area Ventilation Differential Temperature-High instrument. It is recognized that application of Condition B when a single channel of RWCU Area Ventilation Differential Temperature-High is inoperable is conservative in this context. However, in the most restrictive reading of Condition B, isolation capability for RWCU Area Ventilation Differential Temperature-High for a given room is not maintained if the channel is inoperable.~~

insert 2

The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. The 1 hour Completion Time is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.

Insert 2

For Functions 5.b and 5.c, each Function consists of channels that monitor several locations. Therefore, this would require one channel per location to be OPERABLE or in trip (the channels are not required to be in the same trip system) except as allowed by Note (d) to Table 3.3.6.1-1. Note (d) provides clarification that for rooms containing Area Temperature—High instruments and Area Ventilation Differential Temperature—High instruments (the North and South RWCU Pump Rooms, the RWCU Heat Exchanger Room, and the RWCU Phase Separator Room), either Function is sufficient to maintain isolation capability.

BASES

SURVEILLANCE REQUIREMENTS (continued)

ISOLATION SYSTEM RESPONSE TIME tests are conducted on an 18 month STAGGERED TEST BASIS. The 18 month Frequency is consistent with the typical industry refueling cycle and is based upon plant operating experience that shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences.

REFERENCES

1. UFSAR, Section 6.3.

2. UFSAR, Chapter 15.

3. NEDO-31466, "Technical Specification Screening Criteria Application and Risk Assessment," November 1987.

4. UFSAR, Section 4.5.2.4.

5. NEDC-31677P-A, "Technical Specification Improvement Analysis for BWR Isolation Actuation Instrumentation," July 1990.

6. NEDC-30851P-A Supplement 2, "Technical Specifications Improvement Analysis for BWR Isolation Instrumentation Common to RPS and ECCS Instrumentation," March 1989.

7. UFSAR, Section 7.3.

8. UFSAR, Section 6.2.

9. NEDO-31400, "Safety Evaluation for Eliminating the BWR MSIV Closure Function and Scram Function of the MSL Radiation Monitor," Licensing Topical Plant Report for BWROG.

10. NEDO-32291, "System Analysis for Elimination of Selected Response Time Testing Requirements," January 1994; and Fermi-2 SER for Amendment 111, dated April 18, 1997.

11. NEDO-32291-A, Supplement 1, "System Analyses for The Elimination of Selected Response Time Testing Requirement," October 1999.

~~12. NRC Administrative Letter 98-10, "Dispositioning of Technical Specifications That Are Insufficient to Assure Plant Safety".~~