Douglas R. Gipson
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Detroit Edison

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August 7, 1996
NRC-96-0072

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

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

2) NRC Generic Letter 95-07, "Pressure Locking and Thermal Binding of Safety-Related Power-Operated Gate Valves," dated August 17, 1995

3) Detroit Edison letter to NRC, "Detroit Edison Response to NRC Generic Letter 95-07," NRC-96-0007, dated February 13, 1996

4) NRC Letter to Detroit Edison, "Request for Additional Information – Generic Letter 95-07, Pressure Locking and Thermal Binding of Safety-Related Power-Operated Gate Valves, Fermi 2 (TAC No. M93463)," dated July 8, 1996

Subject: Detroit Edison Reply to NRC Request for Additional Information Regarding Generic Letter 95-07 Response (TAC No. M93463)

Enclosed is the additional information regarding Detroit Edison's response to Generic Letter 95-07 as requested in Reference 4 above. Specific responses follow each of the questions in the enclosure to this letter.

A056 1/1

If you have any questions, please contact Andrew V. Antrassian at (313) 586-1856.

Sincerely,

Enclosures

cc: A. B. Beach
M. J. Jordan
A. J. Kugler
A. Vegel
Region III

DETROIT EDISON REPLY TO NRC REQUEST FOR ADDITIONAL INFORMATION REGARDING THE GENERIC LETTER 95-07 RESPONSE

Question 1.

"The February 13, 1996, submittal by Detroit Edison states that a calculation has been performed for valve E4150F001, HPCI [high pressure coolant injection] turbine steam admission, which demonstrates the added load due to stem expansion is still within available operator capability. Please provide this calculation for our review. In addition, has any evaluation or testing been performed to determine the effect of the valve body contracting against the valve disk during cooldown causing potential thermal binding? If so, please provide this evaluation or test results."

Reply 1. - A copy of the referenced calculation for valve E4150F001 is attached for your review. Detroit Edison's GL 95-07 review for valve E4150F001 addressed the potential for thermal binding to occur due to valve body contraction and determined that this mechanism was not credible. This evaluation is also attached for your review.

Question 2.

"In Attachment 1 to GL 95-07, the NRC staff requested that licensees include consideration of the potential for gate valves to undergo pressure locking or thermal binding during surveillance testing. During workshops on GL 95-07 in each Region, the NRC staff stated that, if closing a safety-related power-operated gate valve for test or surveillance defeats the capability of the safety system or train, the licensee should perform one of the following within the scope of GL 95-07.

a. *Verify that the valve is not susceptible to pressure locking or thermal binding while closed,*
b. *Follow plant technical specifications for the train/system while the valve is closed,*
c. *Demonstrate that the actuator has sufficient capacity to overcome these phenomena, or*
d. *Make appropriate hardware and/or procedural modifications to prevent pressure locking and thermal binding.*

The staff stated that normally open, safety-related power-operated gate valves which are closed for test or surveillance but must return to the open position should be evaluated within the scope of GL 95-07. Please discuss if valves which meet this criterion were included in your review, and how potential pressure-locking or thermal-binding concerns were addressed."

Reply 2. - Normally open safety-related power-operated gate valves potentially affected by pressure locking or thermal binding while closed for test or surveillance were considered in Detroit Edison's review of valves identified for GL 95-07. In general, valves that are realigned as part of test or surveillance evolutions are restored to the normal position before the evolution is considered successfully completed. During these periods, and during other periods of off-normal valve alignment, affected safety functions are considered out of service and applicable plant Technical Specifications are followed consistent with the above recommendation b. In Detroit Edison's February 13, 1996 response, Table 2, column 4C provides the results of Detroit Edison's review of normally open valves which are closed and subsequently reopened by other than Technical Specification surveillance procedures. The Comment column of Table 2 provides the basis for exclusion of the valves in this category from further consideration.

Question 3

"Through review or operational experience feedback, the staff is aware of instances where licensees have completed design or procedural modifications to preclude pressure locking or thermal binding which may have had an adverse impact on plant safety due to incomplete or incorrect evaluation of the potential effects of these modifications. Please describe in general terms the evaluations you performed and the training for plant personnel that you have conducted for each design or procedural modification completed to address potential pressure-locking or thermal-binding concerns."

Reply 3. - A procedure revision placing valve E4150F007, HPCI Pump Discharge Isolation, under administrative controls has been completed such that the system is declared inoperable when the valve is repositioned closed. Training of Operations shift personnel on this procedure revision has been completed. In addition, valve E5150F012, RCIC Pump Discharge Isolation, was previously placed under adequate administrative controls to address Bulletin 85-03 concerns. No other valves are currently being considered for administrative controls to address pressure locking or thermal binding.

Table 5A of Detroit Edison's February 13, 1996 response identified three valves for which modifications were completed during the Fourth Refueling Outage and three additional valves that will be modified during the Fifth Refueling Outage to address potential pressure locking concerns.

Personnel involved in the development and implementation of these modifications were aware of GL 95-07 operational experience through participation in various industry, owner, and user group meetings. The safety functions (i.e., containment isolation, emergency core cooling, etc.) of each valve to be modified were considered. The modifications were developed to minimize the impact on these safety functions, as well as testing, maintenance, and operation burden. The modifications were reviewed by a multi-disciplined review group and by the Onsite Review Organization, and Safety Evaluations were prepared for each modification. Affected drawings, procedures, and databases have been changed to reflect the valve modifications including proper wedge orientation if applicable. These actions provide adequate assurance that these modifications do not adversely impact plant safety.

INFORMATION ONLY

GENERIC LETTER 95-07
PRESSURE LOCKING AND THERMAL BINDING EVALUATION

PLANT ENGINEERING

TITLE	APPROVED, AS NOTED	NOT APPROVED
MECH	02/12/96	
	2-13-96	
FINAL	2-13-96	
SUPERSEDED BY:		

VECTRA Technologies
215 Shuman Blvd.
Naperville, Illinois

VECTRA Technologies

Prepared By: _____

Reviewed By: _____ For: SUSAN KORN

Detroit Edison Company

Accepted By: _____ 02/12/96

Accepted By: _____ 2-12-96

DE993-0742 5-94
VENDOR DOCUMENT APPROVAL

DTC: TDDATA
DSN: 102.065 F10 001 PAGE: ___ REV: ___
PIS NO. A3100F
P.O. 223481 EDISON FILE NO: PI-15421
DATE: 960212 / VENDOR NAME: VECTRA
SUPERSEDING EDISON DRAWING NO: ___

REFERENCES: DER 95-0680
DER 96-0018

FERMI THERMAL BINDING EVALUATION RESULTS

INFORMATION ONLY

TECHNICAL INPUTS

PIS:	E4150F001	Component Name:	High Pressure Coolant Injection (HPCI) Turbine Steam Admission
Alternate EID:	V17-2022		
PID:	M-2035	Flow Diagram:	M-5708-1
PID Sheet Number:		Disc Type:	FLEX WEDGE
PID Coordinates:	E-3	Fluid Media	STEAM

THERMAL BINDING REVIEW

NOTE: Valves classified as double-disc gates using a wedging mechanism to seat the discs, including flexible-wedge, split-wedge and some parallel-disc gate valves, may be susceptible to thermal binding under conditions of a significant temperature reduction in the closed position, or by being exposed to a significant upstream and downstream temperature difference (Ref: GL 95-07 page 5 of 9, 3rd paragraph).

Consider the following prior to answering questions 13, 14 and 15 (Form 4 should be used for Temperature and Pressure info.):

- *Insulation Class
- *Min/Max ambient temperature
- *Min/Max temperature for upstream process side
- *Min/Max temperature for downstream process side
- *Min/Max process temperature at valve closing
- *Min cooldown temperature prior to valve re-opening
- *Closure control logic (e.g., torque-seated; position seated)

		Yes/No
13.	Is the valve, prior to opening, subject to a significantly higher temperature on one disc side (upstream/downstream) compared to the other disc side?	No

If yes, briefly state plant condition or event:

A steam warm-up bypass line exists upstream of this valve which maintains the HPCI supply line hot down to the valve. Due to insulation the valve will reach an equilibrium temperature mitigating thermal binding.

14.	Is the valve stem subject to a significantly higher temperature upon valve closure, and the actuator has no spring compensation for stem expansion?	Yes	(Note: Minimum general area temperature is 65F per UFSAR)

If yes, briefly state plant condition or event:

The valve stem may cool to ambient during a surveillance. Upon closure the stem could heat up and grow, thereby increasing the seating and unseating loads.

15.	Does the valve, upon closure, experience significant cooldown from the process temperature without being cycled open (particularly if it has a solid wedge)?	No

If yes, briefly state plant condition or event:

There is a steam warmup by-pass line upstream of the valve which prevents the valve from cooling down.

PREPARED: CHECKED:

FERMI THERMAL BINDING EVALUATION RESULTS

INFORMATION ONLY

TECHNICAL INPUTS

PIS:	E4150F001	**Component Name:**	High Pressure Coolant Injection (HPCI) Turbine Steam Admission
Alternate EID:	V17-2022		
PID:	M-2035	**Flow Diagram:**	M-5708-1
PID Sheet Number:		**Disc Type:**	FLEX WEDGE
PID Coordinates:	E-3	**Fluid Media:**	STEAM

CONCLUSIONS on VALVE EXCLUSIONS:

	Yes/No
Based on the above information and supporting analysis, as required, is this valve considered to be susceptible to thermal binding?	Yes

Exclusion Basis:

There is a steam warm-up bypass line upstream of the valve which prevents thermal gradients across the disk and opening under cold conditions. However, the valve stem may cool off during a system surveillance when opened for HPCI turbine operation and then heat up upon closure. Therefore this is a potential thermal binding candidate.

PREPARED _____ CHECKED _____