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SUBJECT: Forwards response to RAI re GL 95-07, "Pressure Locking & Thermal Binding of SR Power-Operated Gate Valves."

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July 22, 1996

AEP:NRC:0966AE

Docket Nos.: 50-315  
50-316

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555

Gentlemen:

Donald C. Cook Nuclear Plant Units 1 and 2  
GENERIC LETTER 95-07 "PRESSURE LOCKING AND THERMAL BINDING OF  
SAFETY-RELATED POWER-OPERATED GATE VALVES"  
REQUEST FOR ADDITIONAL INFORMATION

The attachments to this letter contain the Cook Nuclear Plant  
response to the request for additional information transmitted by  
letter dated June 12, 1996 from J. B. Hickman to E. E. Fitzpatrick.

Sincerely,

*for*   
E. E. Fitzpatrick  
Vice President

SWORN TO AND SUBSCRIBED BEFORE ME

THIS 22nd DAY OF July, 1996.

  
\_\_\_\_\_  
Notary Public

My Commission Expires: 6-28-99

/jen

Attachments

cc: A. A. Blind  
H. J. Miller  
NFEM Section Chief  
NRC Resident Inspector - Bridgman  
J. R. Padgett

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ATTACHMENT 1 TO AEP:NRC:0966AE

REQUEST FOR ADDITIONAL INFORMATION

GENERIC LETTER 95-07

Question 1

"In light of the high safety significance and due to the lengthy corrective action schedules for the four containment sump recirculation valves 1-ICM-305, -306, 2-ICM-305, -306, which extends until 1999, the staff believes it is necessary to review the licensee's calculations supporting the operability of these valves. Please provide these calculations for our review."

Response

In order to support the closure of the inspection on TI 2515/129, "Pressure Locking of PWR Containment Sump Recirculation Gate Valves", AEP performed a heat transfer calculation that determines the pressure rise in the valve bonnet, and an evaluation of disk drag and actuator capability which was reviewed and discussed with NRC Region III. Subsequently, an engineering consulting firm was contracted to provide an independent calculation/analysis. We have provided this as attachment 2 of this letter. This calculation uses conservative assumptions and provides assurance that the actuators of these valves have sufficient capability to perform their intended function under pressure locking conditions.

Question 2

"Valves NMO-151, -152 and -153, pressurizer PORV block valves, may be susceptible to pressure locking or thermal binding during a postulated steam generator tube rupture or low temperature overpressurization event. Please discuss how these concerns were addressed at D. C. Cook."

Response

The pressurizer PORV block valves are installed to isolate the pressurizer from the PORVs to allow the unit to continue operation if one of the PORVs is leaking excessively. Pressure locking or thermal binding of the pressurizer PORV block valves during either a steam generator tube rupture or low temperature overpressurization (LTOP) event is not a concern since they are not required to open in either scenario, as described below.

Should a steam generator tube rupture occur during a time when a PORV block valve is closed, pressure locking or thermal binding is not considered a problem. The emergency operating procedures for Cook Nuclear Plant provide an alternative method to reduce RCS pressure during a steam generator tube rupture event if a PORV flow path is not available by utilizing pressurizer spray, auxiliary pressurizer spray and/or auxiliary feedwater. Thus, recovery from a steam generator tube rupture does not depend on a closed PORV block valve to open.

Pressure locking or thermal binding of a closed LTOP PORV block valve is not considered a problem. The LTOP system uses either the two LTOP pressurizer PORVs or one LTOP pressurizer PORV plus the residual heat removal system safety valve to protect the reactor vessel against pressurized thermal shock during low pressure operation. Technical specifications (T/Ss) require the PORV block valve to be open in a PORV line being used for LTOP purposes. If both LTOP PORVs or block valves are inoperable, technical specifications and LTOP administrative controls provide for LTOP protection by establishing a continuous 2 square inch

vent path. Thus, LTOP does not rely on a closed PORV block valve to open, so pressure locking or thermal binding of a PORV block valve does not affect LTOP.

### Question 3

"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:

- (1) verify that the valve is not susceptible to pressure locking or thermal binding while closed,
- (2) follow plant technical specifications for the train/system while the valve is closed,
- (3) demonstrate that the actuator has sufficient capacity to overcome these phenomena, or
- (4) 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."

### Response

The condition in which a normally open, safety-related, power-operated gate valve is closed for surveillance or test and is required to reopen was addressed through the screening and evaluation process applied for Cook Nuclear Plant. For valves with an open safety function, the screening criteria required consideration of whether the valves are normally or occasionally closed during normal or safety related operation, which includes closure for surveillance or testing purposes. No pressure locking or thermal binding concerns were identified in normally open safety-related, power-operated gate valves at Cook Nuclear Plant.

### Question 4

"Through review of 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 evaluations and training for plant personnel that have been conducted for each design or procedural modification completed to address potential pressure locking or thermal binding concerns."

Response

In the case of design modifications, the only physical design changes made at Cook Nuclear Plant were the addition of bonnet pressure equalizing lines. These modifications were accomplished under formal design change procedures, and valve testing procedures were revised as necessary to reflect the changes. The equalizing lines have been installed in the plant for over ten years with no adverse impact on plant safety due to incomplete or incorrect evaluation of the modifications. At Cook Nuclear Plant no procedural modifications were required to preclude the potential of pressure locking or thermal binding of power-operated gate valves.

ATTACHMENT 2 TO AEP:NRC:0966AE

SUPPLEMENTARY ANALYSIS OF CONTAINMENT

SUMP RECIRCULATION VALVES