April 26, 1999

MEMORANDUM TO: File

FROM: Thomas W. Alexion, Project Manager, Section 1 ORIG. SIGNED BY
Project Directorate IV & Decommissioning
Division of Licensing Project Management

SUBJECT: DISCUSSIONS WITH LICENSEE ON ITS RESPONSE TO GENERIC LETTER 95-07, "PRESSURE LOCKING AND THERMAL BINDING OF SAFETY-RELATED POWER-OPERATED GATE VALVES, SOUTH TEXAS PROJECT, UNITS 1 AND 2 (TAC NOS. M93521 AND M93522)

The NRC staff needs to conduct a phone call with the licensee on the above subject. In order to conduct the phone call, the staff needs to provide the licensee with the attached discussion areas to make the call as productive as possible. Following the call, the staff may follow-up some or all of these discussion areas with a formal request for additional information.

The purpose of this memorandum is to place the attachment in the Public Document Room.

Docket Nos. 50-498
and 50-499

Attachment: As stated

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

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Discussion Areas for Phone Call

Generic Letter 95-07, "Pressure Locking and Thermal Binding of Safety-Related Power-Operated Gate Valves"

South Texas Project, Units 1 and 2

1. Your February 13, 1996, submittal states that the high head hot leg isolation valves, 1/2-SI0008A/B/C, and the low head safety injection hot leg isolation valves, 1/2-SI0019A/B/C are susceptible to thermal-induced pressure-locking, are opened 13 hours into the accident, that a 23 psi/°F pressurization rate was applicable, that the Commonwealth (ComEd) pressure locking methodology was used to calculate the thrust required for the valves to operate during pressure locking conditions, and that full voltage would be available to the valves actuators following the design-basis accident.

   Describe the minimum normal environmental temperature that the valves can experience (the submittal states that maximum environmental temperature is approximately 150°F) and the basis for the 23 psi/°F pressurization rate. Testing conducted by Idaho National Engineering and Environmental Laboratories (INEEL) identified pressurization rates of 50psi/°F. NUREG/CR-6611, "Results of Pressure Locking and Thermal Binding Test of Gate Valves," documents the results of this testing.

   Describe your design-/licensing-basis requirements for determining when full/degraded voltages are available.

   Your submittal states that the ComEd pressure-locking calculation assumed initial bonnet pressure to be equal to that of the static of head of water in the piping. Explain why the bonnets would not be initially pressurized to reactor coolant system normal operating pressure.

   Explain if the temperature of these valves could increase during the cold leg recirculation phase of an accident or during plant heatup while the RHR system is operating.

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 surveillance but must return to the open position, would be evaluated within the scope of GL 95-07. Please discuss if valves that meet this criterion were included in your review.

3. Your February 13, 1996, submittal states that the low head safety injection cold leg isolation valves, 1/2-RH0031A/B/C, are susceptible to pressure locking and the ComEd pressure-locking methodology was used to demonstrate that the valves would operate during pressure-locking conditions. It appears that you are inappropriately using the ComEd pressure-locking methodology to demonstrate that these valves will operate during a differential pressure condition in lieu of a pressure-locking condition. Verify that this is the correct understanding of your submittal.

4. You used an analytical method to demonstrate that valves would operate during thermal binding conditions. Discuss any testing that was performed to validate your methodology. It is difficult to accept methodologies as corrective action for GL 95-07 that have not been tested.

5. Your February 13, 1996, submittal states that your thermal binding methodology was used to demonstrate that reactor coolant system normal and alternate charging flow isolation valves, 1/2-CV0003 and 1/2-CV0006, would open during thermal binding conditions. Do you have any operating experience that demonstrates that the valves will operate during thermal binding conditions?

6. ComEd recommends that, when using its methodology, minimum margins should be applied between calculated pressure-locking thrust and actuator capability. These margins along with diagnostic equipment accuracy and methodology limitations are defined in a letter from ComEd to the NRC dated May 29, 1998 (Accession Number 9806040184). Explain if you are meeting these requirements for all valves for which the ComEd pressure-locking methodology is used.

7. Explain why containment spray pump discharge valves, 1/2-MOV-0001A/B/C, are not susceptible to pressure locking following operation of the containment spray pumps with the discharge valves shut. Are there any pressure-locking scenarios where the valves will operate at locked rotor conditions until the containment spray pump develops full discharge pressure?

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