

G.L. 95-07



**PECO NUCLEAR**

A UNIT OF PECO ENERGY

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Nuclear Group Headquarters  
965 Chesterbrook Boulevard  
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June 19, 1996

Docket Nos. 50-352  
50-353

License Nos. NPF-39  
NPF-85

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

SUBJECT: Limerick Generating Station, Units 1 and 2  
Response to NRC Request for Additional Information Regarding 180 Day  
Response to Generic Letter 95-07, "Pressure Locking and Thermal  
Binding of Safety-Related Power-Operated Gate Valves."

- REFERENCE:
- 1) Letter from G. A. Hunger, Jr., (PECO Energy Company) to NRC dated February 13, 1996
  - 2) Letter from F. Rinaldi (NRC) to G. A. Hunger dated May 16, 1996

Dear Sir:

The NRC issued Generic Letter (GL) 95-07, "Pressure Locking and Thermal Binding of Safety-Related Power-Operated Gate Valves," on August 17, 1995. In the GL the NRC requested that addressees perform, or confirm that they previously performed, evaluations of operational configurations of safety-related, power-operated gate valves for susceptibility to pressure locking and thermal binding.

In Reference 1, PECO Energy provided its 180 day response to GL 95-07. In Reference 2, the NRC requested additional information regarding that response. This letter provides the requested additional information. Restated below are the NRC questions followed by the PECO Energy response.

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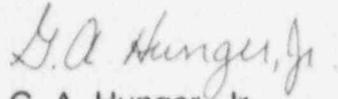
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If you have any questions concerning this submittal or require additional information please contact us.

Sincerely,

A handwritten signature in cursive script that reads "G. A. Hunger, Jr.".

G. A. Hunger, Jr.  
Director- Licensing

Attachment

cc: T. T. Martin, Administrator, USNRC, Region 1  
N. S. Perry, Senior Resident Inspector, LGS

## NRC Question 1

Regarding valve HV-551/2-F001 within the High Pressure Coolant Injection (HPCI) steam isolation system. If it is a flexible-wedge, double-disk, or split wedge gate valve:

State if this valve has been evaluated for possible thermally-induced pressure locking caused by condensate collection. If so, please provide this evaluation.

State if this valve has been evaluated for possible thermal binding. If so, please provide this evaluation.

## PECO Energy Response

HPCI Turbine Steam Admission Valve HV-55-1/2F001 is a flexible wedge gate valve. It was previously evaluated for thermally-induced pressure locking caused by condensate collection as well as for thermal binding (TB) prior to our Reference 1 submittal. It was found not susceptible to either thermally-induced pressure locking (TIPL) caused by condensate collection or thermal binding. As a result, it was not included in that submittal.

The evaluation concluded that the valve is not susceptible to TIPL for the following reasons: 1) the steam line is sloped away from the valve toward the drain pot and the valve stem is oriented vertically, both of which prevent steam line condensate from collecting in the valve bonnet, and 2) the valve is kept at a relatively constant temperature by reactor pressure steam against the valve wedge which prevents thermally-induced pressurization of any condensate present in the bonnet due to steam leakage.

The evaluation also concluded that the valve was not susceptible to thermal binding since it is heated by condensing steam at all times. The absence of thermal binding has been, and will continue to be, proven by system surveillance tests.

The possibility of TB due to cooldown as part of a normal reactor depressurization was considered. However, HPCI is only required to be operable above 200 psig reactor pressure. Considering the difference in saturated steam temperature between normal operating pressure and 200 psig, and the insulation on the entire HPCI line, the typical reactor depressurization rate will not produce a significant temperature change of the F001 valve body. Therefore, this scenario is not a concern.

The possibility for TB following a system outage was also evaluated. The potential concern is as follows:

- the valve was last closed hot during surveillance testing,

- the HPCI steam line was isolated for a system maintenance outage,
- when returning the system for service, the steam line is un-isolated and warned,
- a time period may exist for TB until the F001 valve body temperature stabilizes.

This scenario is not a concern for the F001 valve since HPCI operability runs are typically performed following these out of service periods, verifying valve operability under these conditions. In addition, successful valve stroking following complete cooldowns have been performed for GL 89-10 periodic verification testing and also to support Cold Shutdown testing of valve HV-55-F105 (valve positions are interlocked).

### NRC 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, within the scope of GL 95-07, one of the following:

- (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 has 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. Discuss if valves which meet this criterion were included in your review, and how you addressed potential pressure locking or thermal binding concerns.

### PECO Energy Response

Valves which are normally open and are closed for test or surveillance and which must return to the open position were evaluated within the scope of GL 95-07. PECO Energy has verified that these valves are not susceptible to pressure locking or thermal binding while closed.

None of these valves were found to be susceptible while in this configuration due to the absence of system pressure or temperature transients as a result of, 1) other system blocking during plant operation or, 2) plant conditions during testing (e.g., a normally open injection valve which is closed to support surveillance testing of the normally closed injection valve only during cold shutdown conditions).

### NRC Question 3

Through the review of operational experiences, 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. Describe evaluations and training of plant personnel conducted for each design or procedural modification, that addressed potential pressure locking or thermal binding concerns.

### PECO Energy Response

PECO Energy has performed several design modifications involving wedge relief holes or external bypass lines to preclude pressure locking of susceptible gate valves at LGS.

A comprehensive design evaluation was performed in accordance with PECO Energy's modification process including the following considerations as appropriate:

- bi-directional seating capability and other system operating modes,
- ASME B&PV Code Section III requirements,
- ASME B&PV Code Section XI Pressure Isolation Valve leakage,
- 10CFR50 Appendix J leakage,
- seismic design requirements,
- high energy/moderate energy line break requirements.

As part of its modification process, PECO Energy also issued modification Training Bulletins to Operations and Training personnel, evaluated operator/plant procedure impact, defined test requirements, specified modification acceptance criteria, and identified documents for configuration control.