



Southern California Edison Company

23 PARKER STREET
IRVINE, CALIFORNIA 92718

WALTER C. MARSH
MANAGER OF NUCLEAR REGULATORY AFFAIRS

April 26, 1995

TELEPHONE
(714) 454-4403

Nuclear Regulatory Commission
Attention: Chief, Rules Review and Directives Branch
Washington, DC 20555

Gentlemen:

Subject: Southern California Edison's (Edison) Comments on Proposed Generic Letter; Pressure Locking and Thermal Binding of Safety-Related Power-Operated Gate Valves

Reference: Federal Register, "Proposed Generic Letter; Pressure Locking and Thermal Binding of Safety-Related Power-Operated Gate Valves," March 27, 1995

In the referenced federal register, the NRC published the subject proposed Generic Letter for public comments. Attached are Edison's comments on this proposed generic letter.

If you have any questions or require additional information, please contact me.

Sincerely,

9505030305 950426
PDR ADOCK 05000206
P PDR

GL01
111

ATTACHMENT

COMMENT 1:

The proposed Generic Letter should specify that sliding coefficients of friction for the applicable materials, rather than valve factor, will be used in conjunction with a double disc drag condition when calculating an actuator's capability to overcome postulated pressure locking conditions for the long term.

COMMENT 2:

The proposed Generic Letter should state that in evaluating thermally induced pressure locking of a closed gate valve, if a distinct source of heat (other than normal cyclic changes in ambient temperature) cannot be identified, thermally induced pressure locking of that gate valve need not be considered credible.

COMMENT 3:

The proposed Generic Letter should allow that actual motor and gear efficiencies, as determined from Motor Operated Valve Generic Letter 89-10 testing, will be considered suitable for determining capability of an actuator to overcome pressure locking & thermal binding for the long term.

COMMENT 4:

The proposed Generic Letter should state that if a limit to bonnet pressure may be quantified, in a pressure locking evaluation, then analytical methods demonstrating sufficient actuator capability will be satisfactory for the long term. In addition, the proposed Generic Letter should state the methodology will be applicable to both large and small gate valves, since the methodology and issues are identical to both groups. Examples where pressure may be quantified would be gate valves supplied with internal relief valves with known setpoints, or gate valves susceptible to pressure locking due to some known pressure such as pump shutoff pressure or some other quantifiable system pressure.

COMMENT 5:

As stated in the proposed Generic Letter, thermal binding is applicable to solid wedge gate valves and possibly flex wedge gate valves with high temperature gradients. Unless "high temperature gradient" is defined by the proposed Generic Letter, flex wedge gate valves would not be considered susceptible to thermal binding given the lack of supporting industry events documenting thermal binding of flex wedge gate valves.

COMMENT 6:

Thermally induced pressure locking occurs due to an increase in the volume of water within the valve bonnet as a result of increasing temperature. When a water solid valve bonnet is assumed, the temperature increase results in a pressure increase of the water within the bonnet. No specific rate of

pressure increase due to temperature increases in a water solid valve bonnet is identified in the proposed Generic Letter. As stated in NUREG 1275, pressure will increase at a rate of 100 psi/F at temperatures greater than 450 F, and pressure will increase at a rate of 33 psi/F in the range of 100 F.

Therefore the proposed Generic Letter should state that the thermally induced pressure increase rate for a water solid valve bonnet will be specified, in accordance with NUREG 1275, as:

33 psi/F for temperatures up to 450 F

100 psi/F for temperatures equal to or greater than 450 F.

In addition the proposed Generic Letter should state, that if actuator capability can be shown to be sufficient to open valves with these calculated pressures, then this evaluation will be acceptable for the long term.

COMMENT 7:

In addition to physical modification identified in NUREG 1275, procedural modifications which would eliminate the potential for pressure locking and thermal binding should be considered as suitable corrective actions and specifically endorsed by the proposed Generic Letter.

COMMENT 8:

The proposed Generic Letter should state that gate valves, located in gas systems other than steam, should be considered exempt from pressure locking and thermal binding.

COMMENT 9:

Based on lack of documented occurrences, gate valves not in systems identified in AEOD/S92-07 should be considered exempt from pressure locking and thermal binding. The proposed Generic Letter should clarify which systems are considered "susceptible" to pressure locking and thermal binding.

COMMENT 10:

Without specific screening criteria specified in the Generic Letter there exists a potential for inconsistencies, from plant to plant, in identifying the applicable pressure locking and thermal binding scope. The proposed Generic Letter should provide specific screening criteria in order to eliminate inconsistencies in implementation.

COMMENT 11:

Background, Paragraph 3, Last sentence states:

"Pressure locking and thermal binding may occur in varying degrees but may not, in all cases, render a valve incapable of operating, though a delay in valve stroke time or valve damage may occur."

If open stroke time can be affected by the possibility of the motor going to locked rotor as specified by the proposed Generic Letter, then credit for locked rotor motor torque should also be permitted by the proposed Generic Letter.

However, experience could support the assumption that for double disc gate valves, which could be subjected to double disc drag under pressure locking conditions, no measurable increase in Motor Operated Valve stroke time is considered to exist if the actuator can be shown to be capable of providing adequate open thrust to overcome the pressure locked condition at rated motor output start torque.

The proposed Generic Letter should either recognize that there is a possibility of an increase in stroke time, and allow use of locked rotor torque, or restrict analysis to the use of motor rated starting torque and assume no measurable increase in stroke time will occur.

COMMENT 12:

Gate valves located in steam lines with the valve stem and bonnet oriented in a normal, upright, & vertical position should be excluded from the potential of condensate collection and subsequent thermal induced pressure locking. The proposed Generic Letter identifies valve orientation as a means for condensate collection in steam valves but does not specify what "orientation" is. The proposed Generic Letter should clarify this item and permit exclusion of Power Operated Valves whose orientation is not a concern.

COMMENT 13:

The Generic Letter refers to Generic Letter 89-10, Supplement 6 as providing an acceptable approach to address pressure locking and thermal binding. Within Supplement 6 it is stated that "external heat loads may be evaluated in a bounding manner". Edison is unclear to how this would affect the pressure locking and thermal binding evaluation. The proposed Generic Letter should clarify this statement.

COMMENT 14:

Retraction of the valve stem during the open valve stroke will increase the available bonnet volume thereby decreasing the pressure of a water solid valve bonnet. Due to the clearances within a gate valve, the amount of stem travel prior to full disc movement may significantly decrease the internal bonnet pressure. Taking credit for known gate valve internal clearances as they relate to opening stem travel should be credited within the proposed Generic Letter as a suitable means of internal bonnet pressure reduction during stroking.

COMMENT 15:

ATTACHMENT 1, item 1, paragraph states:

"The evaluation also should include review of generic studies for site-specific applicability, such as in the areas of thermal effects and design-basis depressurization."

The intended meaning of the above sentence is not clear. This concept should be clarified in the proposed Generic Letter.

COMMENT 16:

Although not consistently stated in the draft Generic Letter, the purpose of the Generic Letter, as initially stated in the first paragraph, is to ensure safety related gate valves "are capable of performing their required safety functions." Therefore, the evaluation of and corrective actions taken as a result of potential pressure locking or thermal binding of safety related valves where safety function is not impaired* will be based on economic concerns at the utility.

* For example: a safety related gate with no safety function to open.

COMMENT 17:

Although the susceptibility evaluation and further analysis as described in 50.54(f) Information Request, 1.a, 1.b, and 1.c, would be completed at the required time, analysis and evaluations at operating plants are living documents and as such are updated periodically as components are added or deleted from the plant, or as the operating procedures for the plant are changed. Therefore, the proposed Generic Letter should recognize that it would be better to retain this analysis at the plant, where it would be available for audit, rather than submit it to the NRC as called for in 2b. If the documents were submitted to the NRC they would either have to be updated periodically, or it should be made known that they are obsolete at the time of submittal.

COMMENT 18:

The Generic Letter should provide more specific guidance on allowable time extensions for fixes that may require additional engineering, equipment delivery time, plant outage, etc.

COMMENT 19:

The Generic Letter should specifically exclude any need to consider solid-disc gate valve for pressure locking or split-disc gate valve for thermal binding.

COMMENT 20:

The Generic Letter should specifically exclude any need to consider valves for which opening subsequent to possible pressure locking event is not a safety-related requirement (except for assessing the effect of possible equipment damage).

COMMENT 21:

The Generic Letter should allow the possibility of pressure locking or thermal binding if the plant is recoverable from such an event with an insignificant increase in core melt probability.

COMMENT 22:

The Generic Letter should allow the possibility of pressure locking or thermal binding if plant recovery can be achieved by alternate means, such as local manual operation, etc., providing there is an insignificant increase in core melt probability.

COMMENT 23:

The Generic Letter should allow for ignoring the affects of short term temperature changes that do not have enough time to cause bonnet water heatup.

COMMENT 24:

The Generic Letter should allow for the use of motor inertia effects to overcome valve cracking load, for the long term , when the inertia can be quantified.

COMMENT 25:

The Generic Letter should state there is no dissimilarity between justifiable engineering methods (excluding short term operability assessments) that are suitable for small or large valves, or between methods that are suitable for the short or for the long term. This should be stated unless reasoning can be stated, in the proposed Generic Letter, that the engineering methods acceptable for small valves are not acceptable for large valves, and that methods acceptable for the short term are not acceptable for long term.