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U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555 - 0001

Oyster Creek Generating Station
Facility Operating License No. DPR-16
NRC Docket No. 50-219

Subject: Supplement to Response to NRC Generic Letter 95-07 Pressure Locking
and Thermal Binding of Safety Related Power Operated Gate Valves,
Topical Report # 105

An Engineering review of the Oyster Creek response to NRC Generic Letter (GL) 95-07, "Pressure Locking and Thermal Binding of Safety Related Power Operated Gate Valves", Topical Report #105, Revision 0, found an error. Specifically, on Page 13 of 24, for valves V-14-34 & 35, "Isolation Condenser Condensate Return Valves", the last paragraph states in part, "As the valve remains closed during normal operation, the fluid in the bonnet may cool, not heat up further, unless there is a leak in the valve. If there is a leak in the valve, the leak itself will prevent the fluid from pressurizing the bonnet."

Contrary to the above, after extensive review by engineering, which occurred after a thermally induced pressure locking condition occurred, it has since been discovered that, during surveillance testing, pressure locking on these valves can occur because the fluid in the bonnet cavity volume can heat up.

This condition was documented and corrected during the most recent refueling outage. This amendment to our GL 95-07 response submittal to the NRC is being provided at this time to correct the information that was in error. A review of the remaining information in the GL 95-07 response has confirmed that the information is correct and the conclusions are valid.

If any further information or assistance is needed, please contact David Fawcett at 609-971-4284.

Sincerely,



C. N. Swenson
Vice President, Oyster Creek Generating Station

CNS/DIF
Enclosure: Topical Report # 105, Rev. 1

cc: S. J. Collins, Administrator, USNRC Region I
P. S. Tam, USNRC Project Manager, Oyster Creek
R. J. Summers, USNRC Senior Resident Inspector, Oyster Creek
File No. 95100

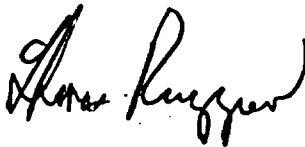
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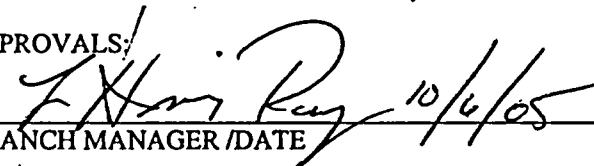
RESPONSE TO NRC GENERIC LETTER 95-07
PRESSURE LOCKING AND THERMAL BINDING OF
SAFETY RELATED POWER OPERATED GATE VALVES

Topical Report #105
REV. 1


Author: T. Ruggiero
DATE: 10/05/05



APPROVALS:

 10/6/05

BRANCH MANAGER /DATE

 10/6/05

DIRECTOR/DATE (for external distribution)

AmerGen

DOCUMENT NO.

NA

TITLE Response to NRC GL 95-07

REV	SUMMARY OF CHANGE	APPROVAL	DATE
1	Revised pages ² 13, 14 and 16 to reflect modification of V-14-34 and V-14-35 to prevent bonnet over pressure <i>Chris Rayner</i> 10/5/07	<i>J. H. H. H. H.</i>	10/6/05

ABSTRACT

The U.S. Nuclear Regulatory Commission (NRC) has issued generic letter 95-07 to request that licensees perform, or confirm that they previously performed, (1) evaluations of operational configurations of safety-related, power-operated (including motor-, air-, and hydraulically operated) gate valves for susceptibility to pressure locking and thermal binding and (2) further analyses, and any needed corrective actions, to ensure that safety-related power-operated gate valves that are susceptible to pressure locking or thermal binding are capable of performing their safety functions within the current licensing bases of the facility.

In the generic letter, the NRC staff is requesting a detailed evaluation and resolution of the issue of pressure locking and thermal binding (PLTB) of the safety related power operated gate valves. This report provides a response to the actions required by the generic letter.

GPUN has reviewed all safety-related power-operated gate valves totaling 57. A logic was developed to evaluate susceptible gate valves whose safety function could be affected by PLTB concern. There are 20 valves which need to open from a closed position either during testing or from a normal position to satisfy the open safety function. All valves, except for the Isolation Condenser (ICS) Return Valves (V-14-34 & V-14-35) were found not to be potentially affected by PLTB to satisfy their safety function for the current licensing basis of OCNGS. The ICS Return valves, V-14-34 and V-14-35, were modified so that they are also not susceptible PLTB.

The Core Spray Maintenance valves are also potentially susceptible to pressure locking, should a LOCA occur while the valves are closed and a parallel injection valve is open. This occurs while stroke time testing the parallel injection valves at power. The Core Spray system is currently considered inoperable during this test and therefore the system is not taken credit for during periods where the valves are closed and this phenomenon can potentially take place. GPUN is evaluating the subject valves during such an event to determine whether the valves can be qualified and are capable to open under all credible scenarios such that the administrative controls would no longer need to be relied upon.

The Core Spray Parallel Injection valves were modified during the last refueling outage (15R) to alleviate the potential for pressure locking in these valves (drilled discs).

Calculations show that the Containment Spray Recirculation valves will not become pressure locked. These valves could experience pressure (≈ 90 psi) in the valve bonnet and zero pressure on either side of the valve following an event requiring drywell spray; however, this will not result in valves being pressure locked.

V-14-34, 35: Isolation Condenser Condensate Return

Valve Size: 10"
Valve Disc Design Parallel Disc Ref. Dwg: W9023271
Valve Location: Reactor Bldg. el. 75" (Overhead)

Function:

Normal Operation – Isolate the Isolation Condenser flow from the Reactor Vessel.
Valves are normally closed.

Accident Condition –

Open: Valves open on ES Signal (Low-Low level, High Reactor pressure) to provide flowpath between Reactor and Isolation Condensers to remove fission product decay heat after reactor scram when the main turbine condenser is not available as a heat sink.

Close: To Isolate a HELB in the system piping. The valves are not required to reopen following an isolation.

PL: These valves were potentially susceptible to system induced pressure locking during a large break LOCA and also during normal operation. Reactor coolant pressure (1020 psi) enters the valve (bonnet) when the valve is periodically stroked.

In 2004, these valves were modified by including a hole in one of the two discs (the disc on the Reactor side). As such, Pressure Locking can no longer occur (references 6.6).

TB: Not a concern based on parallel disc design.

V-20-15, 21, 40, 41: Core Spray System Parallel Injection Valves

Valve Size: 8"
Valve Disc Design: Flex Wedge Ref. Dwg: 2079-5
Valve Location: Reactor Bldg. el. 75' SW Quadrant
Reactor Bldg. el. 51' NW Quadrant

Function:

Normal Operation - No primary function. A secondary function is to provide high pressure - low pressure isolation for leakage past the testable check valves. Valves are periodically cycled for surveillance stroke time tests. Core Spray system is a standby ECCS system. Valves are normally closed.

Accident Condition -

Open: Valves open in response to an ECCS signal and reactor pressure less than 285 psi to provide flow path for Core Spray system to reactor vessel.

Closed: Valves may be periodically closed (operator action) in order to maintain reactor water level within band during Small Break LOCAs.

PL: The valves were modified in 15R outage (drilled disc) to alleviate this potential concern.

TB: System fluid is torus water at temperatures below 160°F during normal and accident conditions (Reference 6.8), which is below the threshold for thermal binding. Valves may be exposed to reactor water via leakage past the system check valves. However, should this occur, the fluid temperature at the valve would remain constant. Thus the valves are not susceptible to TB.

V-21-5, 11: Containment Spray Drywell Spray Valves

Valve Size: 14"
Valve Disc Design: Solid wedge Ref. Dwg: 2713-24 (1537-X)
Valve Location: Reactor Bldg. el. 23', 51'

Function:

Normal Operation - Valve is normally closed, preventing water from spraying the drywell. The Containment Spray system is normally in standby with the piping void of liquid. The system is operated manually, such that the valves are aligned (either to spray the drywell or cool the torus water) before the pumps are started.

TB: These valves are exposed to torus water which remains below 160°F, during normal and accident conditions (Reference 6.8). Note too, that the Torus water heats up during the accident as opposed to cooling down. Thus, TB is not a concern.

5.0 Conclusion

All safety-related power-operated gate valves were evaluated in this report for their susceptibility to pressure locking and thermal binding phenomena. They were further evaluated for their capability to perform their required safety function. For some of these valves the possibility of PTLB does exist, but their safety function is not affected since the valve position changes to safety position before PLTB can affect the valve function. All valves were found not to be affected by PLTB concerns except Core Spray Maintenance Valves V-20-12, 18 (during test only). The Core Spray System is presently considered inoperable while valves V-20-12, 18 are closed (Reference 6.14). Evaluations are ongoing to determine whether the valves should be qualified to operate under such scenarios. Valves V-14-34 and V-14-35 experienced pressure locking but have been modified so that pressure locking can no longer occur (ref. 6.6).

6.0 References

- 6.1 NRC GL 95-07, "Pressure Locking and Thermal Binding of Safety Related Power Operated Gate Valves" dated Aug. 17, 1995.
- 6.2 NRC Nureg 1275, Volume 9, "Operating Experience Feedback Report - Pressure Locking and Thermal Binding of Gate Valves."
- 6.3 Anchor Valve Drawing 2077-9, "8 Inch 600# Gate Valve, Pressure Seal Type"
- 6.4 OCNCS Updated Final Safety Analysis Report (UFSAR)
- 6.5 GPUN Calculation, C-1302-241-5310-072, "Pressure Locking Evaluation-Containment Spray"
- 6.6 Amergen ECR 04-0895, "V-14-34/35 Modification to Prevent Bonet Overpressurization"
- 6.7 GPUN Engineering Standard, ES-027, "OCNCS Environmental Parameters"
- 6.8 GPUN Technical Data Report 993, "Evaluation of Containment Spray / ESW Performance at Elevated Intake Temperature"
- 6.9 GPUN Technical Data Report 1128, "Evaluation of Pressure Locking and Thermal Binding of GL 89-10 Gate Valves at Oyster Creek"
- 6.10 GPUN Memo 5310-95-282, "B&WOG Working Group Meeting," dated December 7 and 8, 1995.
- 6.11 NRC GL 89-10, Supplement 4, "Consideration of Valve Mispositioning in Boiling Water Reactor," dated February 12, 1992.
- 6.12 Deleted
- 6.13 Oyster Creek Nuclear Generating Station Pump and Valve Inservice Testing Program, Rev. 8.
- 6.14 GPUN Memo 2100-96-052, dated 2/13/96, "Interim Guidance for Core Spray System Surveillances."