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An Exelon Company

10 CFR 50.90

October 18, 2005
2130-05-20041

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

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

Technical Specification Change Request No. 328 – Modify Surveillance Requirements for Testing of Main Steam Line Electromatic Relief Valves

Pursuant to 10 CFR 50.90, AmerGen Energy Company, LLC (AmerGen) hereby requests a change to the Technical Specifications included in Oyster Creek Operating License No. DPR-16. The proposed change modifies Technical Specifications (TS) Surveillance Requirement (SR) 4.4.B.1 to provide an alternative means for testing the main steam Electromatic Relief Valves (EMRVs). These valves provide overpressure protection and automatic depressurization relief functions. The proposed change will allow demonstration of the capability of the valves to perform their function without requiring that the valves be cycled with steam pressure while installed.

Additionally, included for your review and approval is Relief Request RV-53 associated with the fourth, ten-year-interval, Inservice Testing (IST) Program for the Oyster Creek Generating Station. The relief request would establish EMRV testing uniformity between the ASME code and the proposed change to the Technical Specifications requested herein.

AmerGen requests approval of the proposed changes by August 30, 2006. Once approved, the amendment shall be implemented within 60 days. The proposed changes have been reviewed by the Plant Operations Review Committee and approved by the Nuclear Safety Review Board. No new regulatory commitments are established by this submittal.

We are notifying the State of New Jersey of this application for changes to the Technical Specifications by transmitting a copy of this letter and its attachments to the designated State Official.

A001

If any additional information is needed, please contact Tom Loomis at (610) 765-5510.

I declare under penalty of perjury that the foregoing is true and correct.

Respectfully,

10/18/05
Executed On

Pamela B. Cowan
Director - Licensing & Regulatory Affairs
AmerGen Energy Company, LLC

DRH

Enclosures: (1) Evaluation of Proposed Change
(2) Markup of Proposed Technical Specification Page Changes
(3) Retyped Pages for Technical Specification Change
(4) Inservice Testing Program Code Relief Request

cc: S. J. Collins, USNRC Administrator, Region I
P. S. Tam, USNRC Senior Project Manager, Oyster Creek
R. J. Summers, USNRC Senior Resident Inspector, Oyster Creek
K. Tosch, Director, Bureau of Nuclear Engineering, New Jersey Department of Environmental Protection
File No. 05036

ENCLOSURE 1

Oyster Creek Technical Specification Change Request No. 328

Evaluation of Proposed Change

ENCLOSURE 1 CONTENTS

SUBJECT: Modify Surveillance Requirement for Testing of Main Steam Line Electromatic Relief Valves.

1.0 DESCRIPTION

This letter is a request to amend Operating License No. DPR-16 for Oyster Creek Generating Station (OCGS).

The proposed change would revise the Operating License to modify Technical Specifications (TS) Surveillance Requirement (SR) 4.4.B.1 to provide an alternative means for testing the electromatic relief valves (EMRVs) located on the main steam system. These valves provide overpressure protection and automatic depressurization relief functions. The proposed change will allow demonstration of the capability of the valves to perform their function without requiring that the valves be cycled with steam pressure while installed.

2.0 PROPOSED CHANGE

The proposed change modifies SR 4.4.B.1 (page 4.4-1) to provide an alternative means for testing the OCGS EMRVs. A footnote for this specification currently requires the valve operability tests to be performed at system operating pressure prior to exceeding 5% power following a refueling outage. This test entails a manually actuated exercise of the valve that utilizes the main steam pressure to lift the valve disc. The proposed changes would delete the footnote, and revise SR 4.4.B.1 to read as follows:

"Verify each relief valve actuator strokes when manually actuated."

The proposed change will allow a demonstration of valve operability by manually stroking the relief valve actuator during an outage without lifting the main valve disc. Bases 4.4 is revised to describe the EMRV operability test program, and is enclosed for your information. The 24 month frequency for SR 4.4.B.1 remains unchanged.

3.0 BACKGROUND

There are five Dresser EMRVs, model 1525VX, on the main steam lines between the reactor vessel and the main steam line isolation valve within the drywell. The EMRVs consist of a main valve assembly, pilot valve assembly, and a solenoid actuator (see Figure 1). The EMRVs are opened by automatic or manual switch actuation of a solenoid. When energized the solenoid actuates the plunger, which pushes down the pilot valve operating lever, thereby opening the pilot valve. When the pilot valve opens, pressure under the main valve disc is vented. This results in an unbalanced steam pressure across the main disc, which moves the main disc downward from its seat thereby opening the main valve.

The function of the EMRVs is described in Updated Final Safety Analysis Report (UFSAR), section 6.3.1.2. The EMRVs are part of the Automatic Depressurization System (ADS), which supports the Emergency Core Cooling System (ECCS). The ADS is designed to depressurize the reactor during a small break loss of coolant accident (LOCA) to permit the low pressure Core Spray (CS) system to inject water into the reactor core. The EMRVs are actuated by simultaneous occurrence of triple low reactor

water level, high drywell pressure, and indication that a core spray booster pump has started and developed adequate differential pressure.

The EMRVs also provide overpressure protection for the reactor pressure vessel as discussed in UFSAR section 6.3.1.2. In the overpressure mode the EMRVs are actuated by pressure switches that monitor reactor vessel pressure.

Experience at OCGS has indicated that manual actuation of the EMRVs during plant operation can lead to main and pilot valve seat leakage. Leakage through the main valve results in increased suppression pool temperature and level. Pilot valve leakage at OCGS results in unidentified drywell leakage.

4.0 TECHNICAL ANALYSIS

Proposed Alternative Test

The proposed revision to the surveillance requirement (SR) provides an alternative method of verifying EMRVs operability. Current TS 4.4.B.1 requires an operability test utilizing the main steam pressure to stroke the EMRV. The proposed alternative test would verify EMRV operability by stroking the EMRV actuator using the manual switch every 24 months. The alternative test would be performed with little or no reactor pressure on a 24 month frequency. Stroke testing of the EMRV main valve will continue to be performed in accordance with the Inservice Testing (IST) program as modified by the attached relief request. Additionally, each valve is removed, refurbished, and stroke tested every two (2) refueling outages. The stroking of the EMRV actuator every 24 months, in combination with the removal, refurbishment, and stroke testing of the valve every two (2) refueling outages will provide a complete verification of the EMRV functional capability.

The alternative test will be performed with the solenoid actuator mounted in its normal position. This will allow testing of the manual actuation electrical circuitry, solenoid actuator, pilot operating lever, and pilot valve assembly. This test will verify pilot valve movement. However, since this test will be performed in the absence of the reactor pressure needed to overcome main valve closure spring force, the main valve will not stroke during the test. Stroking the pilot valve in the absence of steam pressure is referred to as "dry cycling."

Nine Mile Point EMRV Valve Failures

Nine Mile Point 1 (NMP-1), Dresden Nuclear Power Station, Units 1 and 2, and Quad Cities Nuclear Power Station, Units 1 and 2, also utilize the Dresser EMRVs, model 1525VX. As described in an NRC Inspection Report (Reference 1), dated December 22, 2000, NMP-1 experienced a spurious opening and failure to reclose for one of their EMRVs. As stated in the inspection report, the utility concluded that the event was probably caused by a pilot valve bent stem and partial disk-stem separation. The utility further concluded that dry cycling of EMRV pilot valves may result in partial disk-stem separation.

The proposed OCGS valve actuator testing will include manual dry cycling of the pilot valve to verify that the stem travel and lever arm adjusting screw gap are within limits. Following this verification, the EMRV solenoid will be energized to stroke the pilot valve. The stem travel and lever arm adjusting screw gap will then be rechecked to verify that these parameters are within limits following the dry cycling. Partial disk-stem separation caused by dry cycling of the pilot valve would be detected during this recheck. The EMRV manufacturer, Dresser, concluded that this recheck would detect partial disk-stem separation caused by dry cycling of the pilot valve. In addition, dry cycling of the pilot valves has been performed on the EMRVs at the Dresden and Quad Cities Nuclear Power Stations for many years, with no signs of partial or full disc detachment. Therefore, the proposed testing is adequate to detect the partial disk-stem separation experienced at NMP-1.

Regarding the potential for a pilot valve bent stem, the maintenance procedures for the EMRV pilot valves will include appropriate inspections of the stem, pilot valve bushing, and disc to identify any nicks, gouges, or other damage that could impair free movement. The procedure will check the gap at the end of the stem that has the thinnest cross section. This is the area most likely to be bent if not properly handled. In addition, free movement of the stem in the bushing and of the disc-to-stem connection will be checked. This check will assure that the stem is straight, the pilot can travel freely, and the pilot disc can seat properly.

Another NMP-1 event, described in NRC Event Notification Report 39779, was a failure of an EMRV to open when actuated. The failure was reportedly due to inadequate solenoid force caused by high resistance in the cutout switch, such that the output force was not adequate to overcome the pilot spring force. The proposed OCGS actuator testing for the EMRVs will include manual actuation of the electrical circuitry, solenoid actuator, pilot operating lever, and pilot valve assembly. This test will demonstrate that the solenoid force is adequate to overcome the pilot spring force.

Valve Inservice Testing / Preventive Maintenance

The relief valves will continue to be tested in accordance with the OCGS Inservice Testing (IST) Program, fourth ten-year interval, as required by TS 4.3.C. The current IST program for relief valves is based on the ASME OM Code, 1995 Edition through OMa-1996 Addenda. As required by Appendix I, Section I 1.3.3, Class 1 pressure relief valves are tested at least once every 5 years, with a minimum of 20% of the valves tested within any 24 month interval. In practice, this means that two of the five EMRVs will be tested every 24 months, with the other three EMRVs on the subsequent refueling outage. This will be accomplished by replacing the installed valves with new or refurbished valves that have been pre-tested.

The code test will be performed at a steam test facility, where the valve (i.e., main valve and pilot valve) and an actuator representative of the actuator used at the plant will be installed on a steam header in the same orientation as the plant installation. The test conditions in the test facility will be similar to those in the plant installation, including valve body temperature and steam conditions. The valve is then leak tested, functionally tested to ensure the valve is capable of opening and closing (including stroke time), and leak tested a final time. Valve seat tightness is verified by a cold bar test, and if not free

of fog, leakage will be measured and verified to be below design limits. The storage requirements in effect ensure the valves are protected from physical damage. Prior to installation, the valve is again inspected for foreign material and damage. The valve is installed and electrically connected.

As part of the preventive maintenance program during each refueling outage, OCGS replaces the pilot valve assemblies in the EMRVs that are not scheduled for removal and testing. The replacement of the pilot valve assemblies does not involve removal of the EMRVs and does not affect the main valve disc. Additionally, all five (5) solenoid actuators are refurbished on a refueling outage basis. Following replacement of the pilot valve assemblies and installation of the refurbished EMRVs, the proposed SR will require testing of the EMRV actuator as described in the section above ("Proposed Alternative Test") without stroking the main valve. This SR will ensure that the affected portion of the valve will be fully tested. If other maintenance is performed, controls regarding testing requirements following maintenance ensure that appropriate post-maintenance testing is performed. For example, if maintenance is performed that affects the main valve, the capability of the main valve would be tested at the testing facility or on the installed valve at the plant.

Maintenance is also performed on the solenoid actuator with specific attention given to maintenance and testing of the cutout contacts. The contacts are cleaned, the associated springs and mechanisms are inspected, and as-left contact resistances are verified. Resistance checks and meggar tests are performed on both coils. During electrical actuation, operating currents are verified to be within acceptance criteria limits. These steps provide substantial indication that the solenoid operator is capable of functioning as designed.

The solenoid actuator is designed to operate the pilot valve under design conditions. The actuator includes two coils. One coil can be considered a pull-in coil, and the second considered a hold-in coil. The pull-in coil provides sufficient force to actuate the pilot, and then the hold-in coil provides sufficient force to maintain the pilot in an open position. Contacts designated as cutout contacts control the energization of these coils during solenoid motion.

Conclusion

The combination of the test using steam at a test facility, and the proposed valve actuator testing at the site, will provide a complete check of the capability of the valves to open and close. Therefore, the proposed changes provide for the testing of the EMRVs such that full functionality is demonstrated through overlapping tests, without cycling the valves under steam pressure with the valves installed. This approach will reduce the potential for valve seat leakage. The proposed alternative test for the EMRVs reflects the recommendations of NUREG-0737, "Clarification of TMI Action Plan Requirements," Item II.K.3.16, "Reduction of Challenges and Failures of Relief Valves," that the number of relief valve openings be reduced as much as possible and unnecessary challenges should be avoided.

The proposed EMRV actuator test avoids the discharge of steam through the valve discharge piping to the suppression pool, which eliminates confirmation of discharge pipe blockage. As implemented at OCGS, the AmerGen Foreign Material Exclusion program provides the necessary requirements and guidance to prevent and control introduction of foreign materials into structures, systems, and components. This program minimizes the potential for debris blocking a relief valve discharge line. Considering the size of the discharge pipe (8 inches), the energy associated with high pressure steam, and the foreign material exclusion administrative controls, the probability of blocking a relief valve discharge line and preventing the valve function is considered to be extremely remote.

As a result of deleting the requirement for full functional testing of the EMRVs, and replacing these requirements with the proposed SR, the only change in the frequency of testing is that the main valve disc of the EMRVs will be lift tested every two operating cycles (approximately every four years) compared to the current one operating cycle (approximately two years) frequency. A review of the surveillance testing results for the past ten years at OCGS was performed for the EMRVs. The review checked for any failures of the main valve disc to stroke open. Based on this review, it was concluded that no failures of the valves to lift have occurred in the past ten years. Therefore, extending the frequency of checking the function of the main disc from approximately every two years to approximately every four years is not expected to result in additional valve failures.

5.0 REGULATORY ANALYSIS

5.1 No Significant Hazards Consideration

AmerGen has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1. **Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?**

   Response: No

   The proposed change modifies Technical Specifications (TS) Surveillance Requirement (SR) 4.4.B.1 to provide an alternative means for testing the Electromatic Relief Valves (EMRVs). Accidents are initiated by the malfunction of plant equipment, or the failure of plant structures, systems, or components. The performance of EMRV testing is not a precursor to any accident previously evaluated and does not change the manner in which the valves are operated. The proposed testing requirements will not contribute to the failure of the relief valves nor any plant structure, system, or component. AmerGen Energy Company, LLC (AmerGen) has determined that the proposed change in testing methodology provides an equivalent level of assurance that the relief valves are capable of performing their intended safety functions. Thus, the proposed change does not affect the probability of an accident previously evaluated.

The performance of EMRV testing provides confidence that the EMRVs are capable of depressurizing the reactor pressure vessel (RPV). This will protect the reactor vessel from overpressurization and allow the Core Spray system to inject into the RPV as designed. The proposed change involves the manner in which the EMRVs are tested, and has no effect on the types or amounts of radiation released or the predicted offsite doses in the event of an accident. The proposed testing requirements are sufficient to provide confidence that the EMRVs are capable of performing their intended safety functions. In addition, a stuck open EMRV accident is analyzed in the Updated Final Safety Analysis Report (section 15.6.1). Since the proposed testing requirements do not alter the assumptions for the stuck open EMRV accident, the consequences of any accident previously evaluated are not increased.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. **Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?**

   Response: No

   The proposed change does not affect the assumed accident performance of the EMRVs, nor any plant structure, system, or component previously evaluated. The proposed change does not involve the installation of new equipment, and installed equipment is not being operated in a new or different manner. The change in test methodology ensures that the EMRVs remain capable of performing their safety functions. No set points are being changed which would alter the dynamic response of plant equipment. Accordingly, no new failure modes are introduced.

   Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. **Does the proposed change involve a significant reduction in a margin of safety?**

   Response: No

   The proposed change will allow testing of the EMRV actuation electrical circuitry, including the solenoid, and mechanical actuation components, without causing the EMRV to open. Accordingly, in-situ EMRV cycling is avoided, reducing the potential for valve seat leakage. The valves will be tested in accordance with the Inservice Test (IST) Program that involves testing the valve at a test facility using steam. The combination of the IST and proposed actuator test provides confidence that the EMRVs will perform their design function.

The proposed change does not affect the EMRV set points or the operational criteria that directs the EMRVs to be manually opened during plant transients. There are no changes proposed which alter the set points at which protective actions are initiated, and there is no change to the operability requirements for equipment assumed to operate for accident mitigation.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based upon the above, AmerGen concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR50.92(c), and, accordingly, a finding of no significant hazards consideration is justified.

5.2 Applicable Regulatory Requirements/Criteria

10 CFR 50.36, "Technical Specifications," provides the regulatory requirements for the content required in a licensee's TS. Criterion 3 of 10 CFR 50.36(c)(2)(ii) requires a limiting condition for operation to be established for a structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier. 10 CFR 50.36 paragraph (c)(3) specifies that surveillance requirements should ensure that limiting conditions for operation are met.

The testing described in this license amendment application ensures that all of the valve components necessary to actuate the EMRVs will continue to be tested, and full functionality will be demonstrated while minimizing the potential for creating main valve seat or pilot valve leakage caused by cycling the valve. Criterion 3 of 10 CFR 50.36(c)(2)(ii) and paragraph (c)(3) of 10 CFR 50.36 will continue to be met since full functionality will be tested under the proposed methodology.

10 CFR 50.55a requires inservice testing of ASME Code Class 1, Class 2 and Class 3 pumps and valves in accordance with the ASME Boiler and Pressure Vessel Code and applicable addenda, except where specific written relief has been granted by the NRC. Enclosure 4 addresses a relief request from the ASME Code that complements this license amendment application.

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

6.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, "Standards for Protection Against Radiation," or would change an inspection or surveillance requirement. However, the proposed amendment

does not involve: (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22, "Criterion for categorical exclusion; identification of licensing and regulatory actions eligible for categorical exclusion or otherwise not requiring environmental review," Paragraph (c)(9). Therefore, pursuant to 10 CFR 51.22, Paragraph (b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

7.0 PRECEDENT

The NRC has granted similar license amendments for Clinton Power Station in Reference 2, LaSalle County Station in Reference 3, Peach Bottom Atomic Power Station in Reference 4, and Dresden and Quad Cities Nuclear Power Station in Reference 5.

8.0 REFERENCES

1. Letter from U. S. NRC to J. H. Mueller (Niagara Mohawk Power Corp), Nine Mile Point Inspection Report 05000220/2000-008, 05000410/2000-008, dated December 22, 2000.

2. Letter from U. S. NRC to O. D. Kingsley (Exelon Generation Company, LLC), "Clinton Power Station, Unit 1 – Issuance of Amendment (TAC NO. MB2256)," dated March 19, 2002.

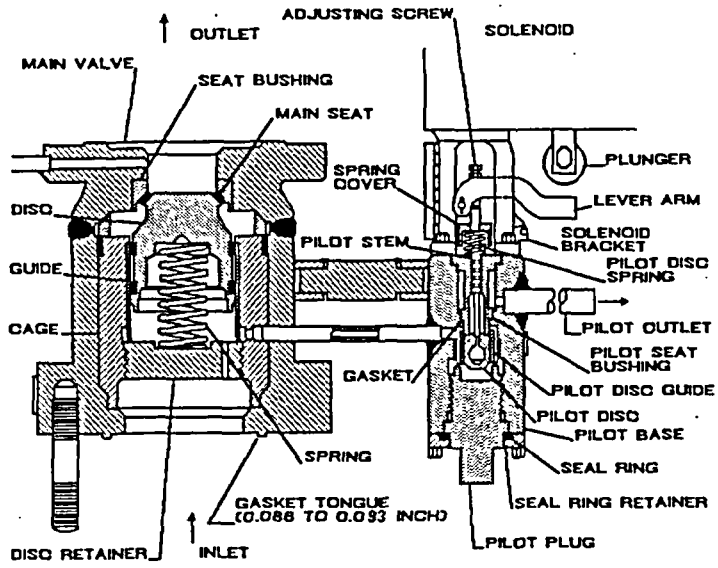
3. Letter from U. S. NRC to O. D. Kingsley (Exelon Generation Company, LLC), "LaSalle County Station, Units 1 and 2 – Issuance of Amendments (TAC NOS. MB2253 and MB2254)," dated December 13, 2001.

4. Letter from M. C. Thadani (U. S. NRC) to G. D. Edwards (PECO Energy Company), "Peach Bottom Atomic Power Station, Unit Nos. 2 and 3, Technical Specifications Revision Relating to the Surveillance of the Safety Relief Valves (TAC NOS. MA1741 and MA1742)," dated October 5, 1998.

5. Letter from U. S. NRC to C. M. Crane (Exelon Generation Company, LLC), "Dresden Nuclear Power Station, Units 2 and 3, and Quad Cities Nuclear Power Station, Units 1 and 2 – Issuance of Amendments for Main Steam Line Relief Valves and Associated Relief Requests (TAC NOS. MC1792, MC1793, MC1794 and MC1795)," dated October 19, 2004.

Figure 1

Diagram of Electromatic Relief Valve



ENCLOSURE 2

MARKUP OF PROPOSED TECHNICAL SPECIFICATION PAGE CHANGES

Revised TS Pages

4.4-1
4.4-3

4.4 EMERGENCY COOLING

Applicability: Applies to surveillance requirements for the emergency cooling systems.

Objective: To verify the operability of the emergency cooling systems.

Specification: Surveillance of the emergency cooling systems shall be performed as follows:

Item	Frequency
A. Core Spray System	
1. Pump Operability	Once/3 months. Also after major maintenance and prior to startup following a refueling outage.
2. Motor operated valve operability	Once/3 months
3. Automatic actuation test	Every three months
4. Pump compartment water-tight doors closed	Once/week and after each entry
5. Core spray header ΔP instrumentation	
Check	Once/day
Calibrate	Once/3 months
Test	Once/3 months
B. Automatic Depressurization	
1. ~~Valve operability~~ — Insert 1	Once every 24 months* — delete
2. Automatic actuation test	Every refueling outage
C. Containment Cooling System	
1. Pump Operability	Once/3 months. Also after major maintenance and prior to startup following a refueling outage.

~~*Valve operability shall be demonstrated at system operating pressure prior to exceeding 5 percent power, following a refueling outage.~~ — delete

Delete

During tests of the electromatic relief valves, steam from the reactor vessel will be discharged directly to the absorption chamber pool. Scheduling the tests in conjunction with the refueling outage permits the tests to be run at low power, prior to 5 percent power, enhancing the safety of the plant by assuring EMRV operability before higher power levels are reached.

Insert 2

The control rod drive hydraulic system is normally in operation, thereby providing continuous indication of system operability. A check of flow rate and operability can be made during normal operation.

INSERTS – OCGS TSCR 328

Insert 1 (SR 4.4.B.1)

Verify each relief valve actuator strokes when manually actuated

Insert 2 (Bases 4.4)

The operability of the Electromatic Relief Valves (EMRVs) is verified by a stroke test of its relief valve actuator as specified in TS 4.4.B.1, and by the Inservice Testing Program (IST).

The EMRV actuator stroke test is performed with the pilot valve actuator mounted in its normal position. The test checks the manual actuation electrical circuitry, solenoid actuator, pilot operating lever, and pilot valve assembly. This verifies pilot valve movement. However, since this test is performed prior to establishing the reactor pressure needed to overcome the main valve closure spring force, the main valve will not stroke during the test, thereby minimizing the potential for valve leakage.

ENCLOSURE 3

RETYPED PAGES FOR
TECHNICAL SPECIFICATION CHANGE

Retyped TS Pages

4.4-1
4.4-3

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4. Pump compartment water-tight doors closed	Once/week and after each entry
5. Core spray header ΔP instrumentation	
Check	Once/day
Calibrate	Once/3 months
Test	Once/3 months
B. Automatic Depressurization	
1. Verify each relief valve actuator strokes when manually actuated	Once every 24 months
2. Automatic actuation test	Every refueling outage
C. Containment Cooling System	
1. Pump Operability	Once/3 months. Also after major maintenance and prior to startup following a refueling outage.

The operability of the Electromatic Relief Valves (EMRVs) is verified by a stroke test of its relief valve actuator as specified in TS 4.4.B.1, and by the Inservice Testing Program (IST).

The EMRV actuator stroke test is performed with the pilot valve actuator mounted in its normal position. The test checks the manual actuation electrical circuitry, solenoid actuator, pilot operating lever, and pilot valve assembly. This verifies pilot valve movement. However, since this test is performed prior to establishing the reactor pressure needed to overcome the main valve closure spring force, the main valve will not stroke during the test, thereby minimizing the potential for valve leakage.

The control rod drive hydraulic system is normally in operation, thereby providing continuous indication of system operability. A check of flow rate and operability can be made during normal operation.

ENCLOSURE 4

Oyster Creek Generating Station

Inservice Testing Program Code Relief Request No. RV-53

Relief Request RV-53

ASME Code Component Affected

System: Main Steam

Valves: Electromatic Relief Valves, V-1-173 (NR-108A), V-1-174 (NR-108B), V-1-175 (NR-108C), V-1-176 (NR-108D), V-1-177 (NR-108E)

Category: B

Applicable Code Edition and Addenda

The applicable code edition for the Oyster Creek Generating Station (OCGS) Inservice Testing (IST) Program Fourth Ten-Year Interval is the ASME OM Code, 1995 Edition through OMa-1996 Addenda. The Fourth Ten-Year Interval began on October 14, 2002 and will conclude on October 13, 2012.

Applicable Code Requirement

Appendix I, Section 3.4.1.d, "Class 1 Main Steam Pressure Relief Valves With Auxiliary Actuating Devices," states: "each valve that has been maintained or refurbished in place, removed for maintenance and testing, or both, and reinstalled shall be remotely actuated at reduced or normal system pressure to verify open and close capability of the valve before resumption of electric power generation. Set-pressure verification is not required."

Reason for the Relief Request

There are five Dresser EMRVs, model 1525VX, on the main steam lines between the reactor vessel and the main steam line isolation valve within the drywell. The EMRVs consist of a main valve assembly, pilot valve assembly, and a solenoid actuator (see Figure 1). The EMRVs are opened by automatic or manual switch actuation of a solenoid. When energized the solenoid actuates the plunger, which pushes down the pilot valve operating lever, thereby opening the pilot valve. When the pilot valve opens, pressure under the main valve disc is vented. This results in an unbalanced steam pressure across the main disc, which moves the main disc downward from its seat thereby opening the main valve.

The function of the EMRVs is described in Updated Final Safety Analysis Report (UFSAR), section 6.3.1.2. The EMRVs are part of the Automatic Depressurization System (ADS), which supports the Emergency Core Cooling System (ECCS). The ADS is designed to depressurize the reactor during a small break loss of coolant accident (LOCA) to permit the low pressure Core Spray (CS) system to inject water into the reactor core. The EMRVs are actuated by simultaneous occurrence of triple low reactor water level, high drywell pressure, and indication that a core spray booster pump has started and developed adequate differential pressure.

The EMRVs also provide overpressure protection for the reactor pressure vessel as discussed in UFSAR section 6.3.1.2. In the overpressure mode the EMRVs are actuated by pressure switches that monitor reactor vessel pressure.

Experience at OCGS has indicated that manual actuation of the EMRVs during plant operation can lead to main and pilot valve seat leakage. Leakage through the main valve results in increased suppression pool temperature and level. Pilot valve leakage at OCGS results in unidentified drywell leakage.

Proposed Alternative and Basis for Use

Pursuant to 10 CFR 50.55a(a)(3)(i), OCGS requests an alternative to the above listed requirement of the OM code. The basis for the relief is that the proposed alternative would provide an acceptable level of quality and safety.

As a proposed alternative, OCGS requests elimination of the in-situ stroke test at reduced or normal system pressure after each valve that has been: 1) maintained or refurbished in place; 2) removed for maintenance and testing; or 3) both, provided its associated actuator is stroke tested.

The proposed alternative test would verify EMRV operability by stroking the EMRV actuator using the manual switch every 24 months. The alternative test would be performed with little or no reactor pressure on a 24 month frequency. Stroke testing of the EMRV main valve will continue to be performed in accordance with the Inservice Testing (IST) program as modified by this relief request. Additionally, each valve is removed, refurbished, and stroke tested every two (2) refueling outages. The stroking of the EMRV actuator every 24 months, in combination with the removal, refurbishment, and stroke testing of the valve every two (2) refueling outages will provide a complete verification of the EMRV functional capability.

The alternative test will be performed with the solenoid actuator mounted in its normal position. This will allow testing of the manual actuation electrical circuitry, solenoid actuator, pilot operating lever, and pilot valve assembly. This test will verify pilot valve movement. However, since this test will be performed in the absence of the reactor pressure needed to overcome main valve closure spring force, the main valve will not stroke during the test. Stroking the pilot valve in the absence of steam pressure is referred to as "dry cycling."

Nine Mile Point 1 (NMP-1), Dresden Nuclear Power Station, Units 1 and 2, and Quad Cities Nuclear Power Station, Units 1 and 2, also utilize the Dresser EMRVs, model 1525VX. As described in an NRC Inspection Report (Reference 5), dated December 22, 2000, NMP-1 experienced a spurious opening and failure to reclose for one of their EMRVs. As stated in the inspection report, the utility concluded that the event was probably caused by a pilot valve bent stem and partial disk-stem separation. The utility further concluded that dry cycling of EMRV pilot valves may result in partial disk-stem separation.

The proposed OCGS valve actuator testing will include manual dry cycling of the pilot valve to verify that the stem travel and lever arm adjusting screw gap are within limits. Following this verification, the EMRV solenoid will be energized to stroke the pilot valve. The stem travel and lever arm adjusting screw gap will then be rechecked to verify that these parameters are within limits following the dry cycling. Partial disk-stem separation caused by dry cycling of the pilot valve would be detected during this recheck. The EMRV manufacturer, Dresser, concluded that this recheck would detect partial disk-stem separation caused by dry cycling of the pilot valve. In addition, dry cycling of the pilot valves has been performed on the EMRVs at the Dresden

and Quad Cities Nuclear Power Stations for many years, with no signs of partial or full disc detachment. Therefore, the proposed testing is adequate to detect the partial disk-stem separation experienced at NMP-1.

Regarding the potential for a pilot valve bent stem, the maintenance procedures for the EMRV pilot valves will include appropriate inspections of the stem, pilot valve bushing, and disc to identify any nicks, gouges, or other damage that could impair free movement. The procedure will check the gap at the end of the stem that has the thinnest cross section. This is the area most likely to be bent if not properly handled. In addition, free movement of the stem in the bushing and of the disc-to-stem connection will be checked. This check will assure that the stem is straight, the pilot can travel freely, and the pilot disc can seat properly.

Another NMP-1 event, described in NRC Event Notification Report 39779, was a failure of an EMRV to open when actuated. The failure was reportedly due to inadequate solenoid force caused by high resistance in the cutout switch, such that the output force was not adequate to overcome the pilot spring force. The proposed OCGS actuator testing for the EMRVs will include manual actuation of the electrical circuitry, solenoid actuator, pilot operating lever, and pilot valve assembly. This test will demonstrate that the solenoid force is adequate to overcome the pilot spring force.

The relief valves will continue to be tested in accordance with the OCGS Inservice Testing (IST) Program, fourth ten-year interval, as required by TS 4.3.C. The current IST program for relief valves is based on the ASME OM Code, 1995 Edition through OMa-1996 Addenda. As required by Appendix I, Section I 1.3.3, Class 1 pressure relief valves are tested at least once every 5 years, with a minimum of 20% of the valves tested within any 24 month interval. In practice, this means that two of the five EMRVs will be tested every 24 months, with the other three EMRVs on the subsequent refueling outage. This will be accomplished by replacing the installed valves with new or refurbished valves that have been pre-tested.

The code test will be performed at a steam test facility, where the valve (i.e., main valve and pilot valve) and an actuator representative of the actuator used at the plant will be installed on a steam header in the same orientation as the plant installation. The test conditions in the test facility will be similar to those in the plant installation, including valve body temperature and steam conditions. The valve is then leak tested, functionally tested to ensure the valve is capable of opening and closing (including stroke time), and leak tested a final time. Valve seat tightness is verified by a cold bar test, and if not free of fog, leakage will be measured and verified to be below design limits. The storage requirements in effect ensure the valves are protected from physical damage. Prior to installation, the valve is again inspected for foreign material and damage. The valve is installed and electrically connected.

As part of the preventive maintenance program during each refueling outage, OCGS replaces the pilot valve assemblies in the EMRVs that are not scheduled for removal and testing. The replacement of the pilot valve assemblies does not involve removal of the EMRVs and does not affect the main valve disc. Additionally, all five (5) solenoid actuators are refurbished on a refueling outage basis. Following replacement of the pilot valve assemblies and installation of the refurbished EMRVs, the proposed SR will require testing of the EMRV actuator as described above without stroking the main valve. This SR will ensure that the affected portion of the valve will be fully tested. If other maintenance is performed, controls regarding testing requirements following maintenance ensure that appropriate post-maintenance testing is performed. For

example, if maintenance is performed that affects the main valve, the capability of the main valve would be tested at the testing facility or on the installed valve at the plant.

Maintenance is also performed on the solenoid actuator with specific attention given to maintenance and testing of the cutout contacts. The contacts are cleaned, the associated springs and mechanisms are inspected, and as-left contact resistances are verified. Resistance checks and meggar tests are performed on both coils. During electrical actuation, operating currents are verified to be within acceptance criteria limits. These steps provide substantial indication that the solenoid operator is capable of functioning as designed.

The solenoid actuator is designed to operate the pilot valve under design conditions. The actuator includes two coils. One coil can be considered a pull-in coil, and the second considered a hold-in coil. The pull-in coil provides sufficient force to actuate the pilot, and then the hold-in coil provides sufficient force to maintain the pilot in an open position. Contacts designated as cutout contacts control the energization of these coils during solenoid motion.

The combination of the test using steam at a test facility, and the proposed valve actuator testing at the site, will provide a complete check of the capability of the valves to open and close. Therefore, the proposed changes provide for the testing of the EMRVs such that full functionality is demonstrated through overlapping tests, without cycling the valves under steam pressure with the valves installed. This approach will reduce the potential for valve seat leakage. The proposed alternative test for the EMRVs reflects the recommendations of NUREG-0737, "Clarification of TMI Action Plan Requirements," Item II.K.3.16, "Reduction of Challenges and Failures of Relief Valves," that the number of relief valve openings be reduced as much as possible and unnecessary challenges should be avoided.

The proposed EMRV actuator test avoids the discharge of steam through the valve discharge piping to the suppression pool, which eliminates confirmation of discharge pipe blockage. As implemented at OCGS, the AmerGen Foreign Material Exclusion program provides the necessary requirements and guidance to prevent and control introduction of foreign materials into structures, systems, and components. This program minimizes the potential for debris blocking a relief valve discharge line. Considering the size of the discharge pipe (8 inches), the energy associated with high pressure steam, and the foreign material exclusion administrative controls, the probability of blocking a relief valve discharge line and preventing the valve function is considered to be extremely remote.

As a result of deleting the requirement for full functional testing of the EMRVs, and replacing these requirements with the proposed SR, the only change in the frequency of testing is that the main valve disc of the EMRVs will be lift tested every two operating cycles (approximately every four years) compared to the current one operating cycle (approximately two years) frequency. A review of the surveillance testing results for the past ten years at OCGS was performed for the EMRVs. The review checked for any failures of the main valve disc to stroke open. Based on this review, it was concluded that no failures of the valves to lift have occurred in the past ten years. Therefore, extending the frequency of checking the function of the main disc from approximately every two years to approximately every four years is not expected to result in additional valve failures.

Duration of Proposed Alternative

OCGS requests approval of the proposed alternative for the Fourth Ten-Year Interval. The Fourth Ten-Year Interval began on October 14, 2002 and will conclude on October 13, 2012.

Precedents

The NRC has granted similar relief requests for Clinton Power Station, Unit 1 (Reference 1), LaSalle County Station, Units 1 and 2 (Reference 2), Peach Bottom Atomic Power Station, Units 2 and 3 (Reference 3), Dresden Nuclear Power Station, Units 2 and 3, and Quad Cities Nuclear Power Station, Units 1 and 2 (Reference 4).

References

1. Letter from U. S. NRC to O. D. Kingsley (Exelon Generation Company, LLC), "Clinton Power Station, Unit 1 – Relief Request 2204 (TAC NO. MB2548)," dated March 28, 2002

2. Letter from U. S. NRC to O. D. Kingsley (Exelon Generation Company, LLC), "LaSalle County Station, Units 1 and 2 – Relief Request RV-11 (TAC NOS. MB2252 and MB2252)," dated December 13, 2001

3. Letter from U. S. NRC to G. D. Edwards (PECO Energy Company), "Request for Relief OIA-VRR-1 from Inservice Testing of Automatic Depressurization System Safety Relief Valves at Peach Bottom Atomic Power Station, Units 2 and 3 (TAC NOS. MA1741 and MA1742)," dated October 1, 1998

4. Letter from U. S. NRC to C. M. Crane (Exelon Generation Company, LLC), "Dresden Nuclear Power Station, Units 2 and 3, and Quad Cities Nuclear Power Station, Units 1 and 2 – Issuance of Amendments for Main Steam Line Relief Valves and Associated Relief Requests (TAC Nos. MC1792, MC1793, MC1794 and MC1795)." dated October 19, 2004

5. Letter from U. S. NRC to J. H. Mueller (Niagara Mohawk Power Corp), Nine Mile Point Inspection Report 05000220/2000-008, 05000410/2000-008, dated December 22, 2000

Figure 1

Diagram of Electromatic Relief Valve