Station Support Department

PECO ENERGY

10 CFR 50.55a

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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
Submittal of Relief Requests for the Second Ten-Year Interval
Inservice Testing (IST) Program.

Dear Sir/Madam:

Attached for your review and approval are relief requests in accordance with 10 CFR 50.55a(f)(6)(i) associated with the Second Ten-Year Interval Inservice Testing (IST) Program for the Limerick Generating Station (LGS), Units 1 and 2. Several of these relief requests are identified by the same relief request number as identified in the first interval in order to maintain continuity and prevent erroneous cross-references. Gaps which may be noted in the numerical sequencing are the result of relief requests which were deleted due to changes in Code requirements which enable LGS to comply with the new Code.

Based on a start date of January 8, 2000, the LGS, Units 1 and 2 IST Program for the second ten-year interval is required by 10CFR50.55a(f)(4) to comply with the requirements of the 1989 Edition of Section XI of the ASME Boiler and Pressure Vessel Code. Limerick has elected to upgrade the second interval IST Program to comply with the ASME OM Code-1990 Edition. Although this Code version has not been specifically incorporated by reference into 10CFR50.55a(b), it was selected on the basis that by letter dated May 8, 1997, PECO Energy's Peach Bottom Atomic Power Station, Units 2 and 3 requested authorization to base their third interval program on the OM-1990 Code. Authorization was granted by letter dated May 11, 1998 on the basis that the OM-1990 Code is simply a reformatting of the OM-6 and OM-10 standards required by the 1989 Edition of ASME Section XI.

The first ten-year interval for LGS, Units 1 and 2 began on February 1, 1986 and on January 8, 1990, respectively. By letter dated January 23, 1996, the NRC granted approval to a request to delay updating the Unit 1 Inservice Inspection (ISI) and IST Programs until the completion of the first ten-year interval for Unit 2. This action placed Units 1 and 2 on concurrent intervals as discussed in NUREG 1482, Section 3.3.2. Therefore, the second ten-year interval for both Units is scheduled to commence on January 8, 2000 and conclude on January 7, 2010.

If you have any questions, please contact us.

Very truly yours,

James A. Hutton
Director-Licensing

A047

PDR ADOCK 05000352

Attachment

cc: H. J. Miller, Administrator, Region I, USNRC
A. L. Burritt, USNRC Senior Resident Inspector, LGS

RELIEF REQUEST NO. GPRR-2, REVISION 4

Pump(s):

Main Control Room Chilled Water	0AP162 0BP162	
Residual Heat Removal Service Water	0AP506 0BP506	0CP506 0DP506
Emergency Service Water	0AP548 0BP548	0CP548 0DP548
Residual Heat Removal	1AP202 1BP202 1CP202 1DP202	2AP202 2BP202 2CP202 2DP202
Reactor Core Isolation Cooling	1OP203	2OP203
High Pressure Coolant Injection	1OP204	2OP204

Testing Requirement(s):

Paragraph ISTB 4.6.1(a) requires that instrument accuracy be within the limits of Table 4.6.1-1, which specifies an accuracy requirement of ±2% of full-scale for analog pressure and flow instruments. Paragraph ISTB 4.6.1(b)(1) requires that the full-scale range of each analog instrument be not greater than three times the reference value.

Basis for Relief:

Various permanently installed pressure and flow instruments are calibrated to an accuracy that exceeds ±2% of full-scale or have a full-scale range that exceeds three times the reference value as specified by the Code. Although these instruments do not meet Code requirements, they provide the same or better indication accuracy at the reference value than that which is permitted by the Code.

For instruments to be in compliance with the Code, both requirements stated above must be met, individually, for each instrument. The combination of the two requirements (i.e., accuracy equal to ±2% of full-scale and full scale being up to 3 times the reference value) yields a permissible inaccuracy of ±6% of the reference value. Section 5.5.1 of NUREG 1482 states that the staff will grant relief when the combination of the range and accuracy yields a reading at least equivalent to the reading achieved from instruments that meet the Code requirements (i.e., up to ±6 percent).

The following table shows the instrument accuracy and full scale range of the pressure or flow instruments used to conduct inservice testing of the pumps listed above. The resulting instrument tolerance and indicated accuracy are calculated and also listed in the Table. In all cases, the indicated accuracy at the reference value is shown to be within the required 6 percent. Replacement of the existing instruments with Code-compliant instruments provides no safety benefit and could actually lessen the accuracy of the test results.

RELIEF REQUEST NO. GPRR-2, REVISION 4 (cont.)

SYSTEM	INSTRUMENT NUMBER	REFERENCE VALUE	INSTRUMENT RANGE	INSTRUMENT ACCURACY	INSTRUMENT TOLERANCE	INDICATED ACCURACY
011	FLOW E1517	3,400	0 - 12,000	1.51%	181.2	5.33%
011	FLOW E1547	3,400	0 - 12,000	1.51%	181.2	5.33%
011	FLOW E2517	3,400	0 - 12,000	1.51%	181.2	5.33%
011	FLOW E2517	3,400	0 - 12,000	1.51%	181.2	5.33%
012	FI-51-1R601A	9,000	0 - 12,000	3.20%	384	4.27%
012	FI-51-1R601B	9,000	0 - 12,000	3.20%	384	4.27%
012	FI-51-1R602A	9,000	0 - 12,000	3.20%	384	4.27%
012	FI-51-1R602A	9,000	0 - 12,000	3.20%	384	4.27%
049	FI-49-1R600-1	570	0 - 700	3.08%	21.56	3.78%
049	FI-49-2R600-1	650	0 - 700	3.08%	21.56	3.32%
051	FI-51-1R603A	10,000	0 - 12,000	3.20%	384	3.84%
051	FI-51-1R603B	10,000	0 - 12,000	3.20%	384	3.84%
051	FI-51-1R603C	10,000	0 - 12,000	3.20%	384	3.84%
051	FI-51-1R603D	10,000	0 - 12,000	3.20%	384	3.84%
051	FI-51-2R603A	10,000	0 - 12,000	3.20%	384	3.84%
051	FI-51-2R603B	10,000	0 - 12,000	3.20%	384	3.84%
051	FI-51-2R603C	10,000	0 - 12,000	3.20%	384	3.84%
051	FI-51-2R603D	10,000	0 - 12,000	3.20%	384	3.84%
055	FI-55-1R600-1	5,600	0 - 6,000	3.08%	184.8	3.30%
055	FI-55-2R600-1	5,300	0 - 6,000	3.08%	184.8	3.49%
055	PI-55-1R601	860	0 - 1,500	3.05%	45.75	5.32%
055	PI-55-2R601	860	0 - 1,500	3.05%	45.75	5.32%
090	FI-90-034A	600	0 - 800	3.12%	24.96	4.16%
090	FI-90-034B	600	0 - 800	3.12%	24.96	4.16%

Key to systems and instruments

011	Emergency Service Water
012	Residual Heat Removal Service Water
049	Reactor Core Isolation Cooling
051	Residual Heat Removal
055	High Pressure Coolant Injection
090	Main Control Room Chilled Water
FI	Flow Indicator (gpm)
PI	Pressure Indicator (psig)

RELIEF REQUEST NO. GPRR-2, REVISION 4 (cont.)

Alternate Testing:

Based on Section 5.5.1 of NUREG 1482 and the information provided herein, the existing permanently installed pump instrumentation is considered acceptable in meeting the intent of the Code. No alternate testing will be performed.

RELIEF REQUEST NO. GPRR-3, REVISION 2

Pump(s):	Safeguard Piping Fill	1AP256	2AP256
		1BP256	2BP256
	Diesel Fuel Oil Transfer	1AP514	2AP514
		1BP514	2BP514
		1CP514	2CP514
		1DP514	2DP514
	Standby Liquid Control	1AP208	2AP208
		1BP208	2BP208
		1CP208	2CP208

Testing Requirement(s): Paragraph ISTB 4.6.1(a) requires that instrument accuracy be within the limits of Table 4.6.1-1, which specifies an accuracy requirement of ±2% of full-scale for analog pressure and flow instruments. Paragraph ISTB 4.6.1(b)(1) requires that the full-scale range of each analog instrument be not greater than three times the reference value.

Basis For Relief: For instruments to be in compliance with the Code, both requirements stated above must be met, individually, for each instrument. The combination of the two requirements (i.e., accuracy equal to ±2% of full-scale and full scale being up to 3 times the reference value) yields a permissible inaccuracy of ±6% of the reference value. Section 5.5.1 of NUREG 1482 states that the staff will grant relief when the combination of the range and accuracy yields a reading at least equivalent to the reading achieved from instruments that meet the Code requirements (i.e., up to ±6 percent).

PECO Energy uses state-of-the-art ultrasonic instrumentation to measure flow for the pumps listed above. The ultrasonic instruments are calibrated to an accuracy of ±5% of reading instead of the Code required ±2% of full-scale. Although this equipment does not meet the referenced Code requirements, it meets the intent of the Code by ensuring that data collected during inservice testing is measured to a degree of accuracy better than the ±6 % which is permitted by the Code.

Furthermore, the ultrasonic equipment provides more accurate data than that which would be obtained by using the alternate method of measuring tank level change as a function of time.

Installation of Code-compliant instruments in lieu of the portable ultrasonic instruments for flow measurement provides no additional safety benefit.

Alternate Testing: Based on Section 5.5.1 of NUREG 1482 and the information provided herein, the ultrasonic flow instrumentation which is accurate to ±5% of reading is considered acceptable in meeting the intent of the Code. No alternate testing will be performed.

RELIEF REQUEST NO. 11-PRR-1, REVISION 0

Pump(s): Emergency Service Water — 0AP548, 0BP548, 0CP548, 0DP548

Testing Requirement(s): ISTB 5.2 requires inservice testing to be conducted with the pump operating at specified test reference conditions. Further, ISTB 5.2(b) requires that the resistance of the system be varied until the flow rate or pressure equals its reference value, at which point the other parameter (pressure or flow rate) be determined and compared to its reference value.

Basis For Relief: The Emergency Service Water (ESW) System includes a large number of variable heat loads. In addition, the temperature of the system is seasonally dependent and can vary significantly. Therefore, it is extremely difficult and highly impractical to vary the resistance of the system to establish flow or differential pressure conditions at any fixed reference point. Establishment of multiple sets of reference values would not improve the capability to set either variable at a fixed point.

In order to monitor the ESW pumps for degradation and assure their operational readiness, reference pump curves will be used for inservice testing. These pump curves were prepared during flow balancing activities shortly before commercial operation of Unit 2 and include many empirical data points taken over the entire operating range of the pumps, essentially from shutoff head to approximately 2 times the maximum flow required for safe shutdown or accident mitigation. Manufacturer's representatives witnessed and concurred with the development of these curves. Although the curves were developed prior to publication of NUREG-1482, they comply with the conditions specified in Section 5.2 of that document, except as described in Relief Request No. GPRR-2.

Vibration readings are taken in accordance with ISTB 4.6.4(a). In addition to the Code required vibration readings, several additional readings are taken and analyzed in accordance with the LGS Predictive Maintenance Program. Since these pumps show little variation in vibration over their normal operating range, the acceptance criteria for vibration testing complies with the requirements of Table ISTB 5.2-2a.

Alternate Testing: Pump testing is performed quarterly, using the pump curves. Flow, normally in the range of 3000 to 4750 gpm, is measured and total dynamic head is calculated from the pump discharge pressure and the level of the Spray Pond (i.e., suction). The test point is then compared to the pump curve and determined to be within the acceptance range of Table ISTB 5.2-2b (0.90 to 1.10 P_r), which is also plotted on the pump curve. Corrective action, if required, shall meet the requirements of ISTB 6.1.

RELIEF REQUEST NO. GVRR-4, REVISION 2

Valve(s):

49-1032	49-2032
49-1033	49-2033
49-1F064	49-2F064
49-1F065	49-2F065
51-1115A,C	51-2115A,C
51-1116A,C	51-2116A,C
52-1045A	52-2045A
52-1046A	52-2046A

Category: C

Function: The above check valves are located in stay-fill lines to the LPCI, Core Spray, and RCIC Systems. All of these valves have a safety function to close to maintain the respective systems filled in the event that the stay-fill supply is lost. Several of these valves also have a safety function to open to maintain the ECCS and RCIC lines filled in order to prevent water hammer on system initiation and to minimize delay in the delivery of emergency cooling inventory.

Testing Requirement(s):

ISTC 4.5.2 requires that each check valve shall be exercised or examined in a manner that verifies obturator travel to the position required to fulfill its function. This relief request applies to the requirement to verify obturator travel to the closed position only.

Basis for Relief:

During normal operation, the ECCS and RCIC System discharge lines are maintained filled by the non-safety related Condensate Transfer System (CTS). In the event that the CTS is unavailable, the Safeguard Piping Fill System (SPFS) provides an alternate, safety-related source of pressurized fill water to the ECCS and RCIC systems.

The check valves listed above are installed in the configuration described in NUREG 1482, Section 4.1.1. Each keep fill line is equipped with two simple check valves in series. There are no vents, drains, or test connections located between each pair of valves; therefore, no practical method exists to verify proper operation of the individual valves upon reversal of flow. As demonstrated herein, the installation of branch connections and valving to enable testing of these check valves individually would create undue burden, without any increase in the level of safety or assurance that the system would be capable of performing its intended functions. The LGS UFSAR does not take credit for use of two valves in series to retard backflow.

RELIEF REQUEST NO. GVRR-4, REVISION 2 (cont.)

Alternate Testing:

As prescribed under the "NRC Recommendation" heading of Section 4.1.1 of NUREG 1482, each set of series check valves will be exercised quarterly in the reverse direction, as a unit, with the exception of 49-1(2)F064 and 49-1(2)F065 which will be tested on a Cold Shutdown frequency. Both valves will be declared inoperable, and will be disassembled and inspected and repaired or replaced, as necessary, if testing indicates that the valves do not close on reverse flow.

RELIEF REQUEST NO. GVRR-5, REVISION 2

Valve(s):	49-1017	49-2017
	49-1018	49-2018
	49-1F068	49-2F068
	49-1F081	49-2F081
	55-1025	55-2025
	55-1026	55-2026
	55-1F080	55-2F080
	55-1F094	55-2F094

Category: C

Function: These check valves open to equalize pressure between the HPCI and RCIC turbine exhaust lines and the Suppression Chamber as the steam in the piping collapses following turbine operation (e.g., following inservice pump testing). They close to prevent admission of unquenched turbine exhaust steam into the Suppression Chamber.

Testing Requirement(s):

ISTC 4.5.2 requires that each check shall be exercised or examined in a manner that verifies obturator travel to the position required to fulfill its function.

Basis for Relief:

These valves are installed in a series-parallel arrangement and are not provided with any type of auxiliary operators or mechanical exercisers. The configuration used is similar in principle to the one-out-of-two, taken-twice logic arrangements used in the Reactor Protection System, and provides for a high degree of reliability on the basis that no single valve failure would prevent the valves from fulfilling their function as a group.

The piping configuration does not allow for individual testing of these valves. In the forward direction, testing of all four valves as a unit will verify that the configuration can prevent the formation of a vacuum in the exhaust piping, as designed. In the reverse direction, there are sufficient test taps available to allow for the testing of each parallel set of check valves as a pair to verify closure on reverse flow. The installation of additional branch connections and valving to enable testing of these check valves individually would impose undue burden without any increase in the level of safety or assurance that the configuration would be capable of performing its intended functions.

The configuration of these valves is similar in principle to the in-series check valve arrangement described in NUREG 1482, Section 4.1.1, except that the addition of the parallel feature increases reliability while decreasing the ability to test the valves individually. The LGS UFSAR does not take credit for use of the series-parallel configuration for fulfillment of the functions described above .

RELIEF REQUEST NO. GVRR-5, REVISION 2 (cont.)

Alternate Testing:

Forward flow testing will be performed quarterly on all 4 valves, as a unit. All four valves will be declared inoperable if the 4-valve unit fails to allow the required forward flow. Reverse flow testing of each parallel set of check valves (2 sets, 2 valves per set) will be performed quarterly. Both valves in the set will be declared inoperable if testing indicates that the valves do not close on reverse flow.

RELIEF REQUEST NO. 20-VRR-1, REVISION 2

System: Emergency Diesel Generators

Valve(s): 92-1302 A,B,C,D 92-2302 A,B,C,D
92-1303 A,B,C,D 92-2303 A,B,C,D

Category: B

Function: Emergency Diesel Generator starting air valves. These valves are required to open to admit starting air to the Emergency Diesel Generator cylinders.

Testing Requirements:

ISTC 4.2.4(b) requires that the stroke-time of all power-operated valves shall be measured to at least the nearest second.
ISTC 4.2.8 requires test results to be compared to the initial reference values or reference values established in accordance with ISTC 3.4 and ISTC 3.5.

Basis for Relief:

These valves are in starting air lines that are designed as ASME III Class 3, but were furnished with the Diesel Generator assemblies and are not designed to ASME Class 3 requirements. Although these valves are therefore considered to be outside the scope of 10 CFR 50.55a, they have been optionally classified as Safety Class 3 and included in the IST Program commensurate with their importance to safety.
These valves are not equipped with any position indicating devices. Measurement of valve stroke time would require costly and time-consuming test methods which would impose undue burden without providing any increase in safety or assurance that the valves were capable of performing their required function.
Section 3.4 of NUREG 1482 discusses "skid-mounted components and component subassemblies" and specifically mentions valves in diesel air-start subassemblies as examples. The NUREG states that testing of the major component is an acceptable means for verifying the operational readiness of the skid-mounted and component subassemblies if the licensee documents this approach in the IST Program.

Alternate Testing:

Monthly surveillance testing of each Emergency Diesel Generator per LGS Units 1 and 2 Technical Specification requirements assures its ability to start and accelerate to at least 200 rpm within 10 seconds. Degradation of these valves or their failure to operate would be indicated by an increased starting time or failure to start. Failure of any Emergency Diesel Generator to start within the specific time limit shall be evaluated to determine the cause. If it is determined that these starting air valves are suspect, they shall be declared inoperable and repaired or replaced as required.

RELIEF REQUEST NO. 41-VRR-6, REVISION 0

System: Nuclear Boiler

Valve(s): PSV-41-1F013E, H, K, M, S
PSV-41-2F013E, H, K, M, S

Category: C

Function: Automatic Depressurization System (ADS) valves.

Testing Requirements:

Appendix I, Paragraph I 3.2.1 requires that safety valves and pilot-operated pressure relief valves equipped with auxiliary actuating devices be remotely actuated at reduced and normal system operating pressure to verify open and close capability.

Appendix I, Paragraph I 3.4.1(d) requires each valve that has been maintained or refurbished in place, removed for maintenance and testing, or both, and reinstalled to be remotely actuated at reduced system pressure to verify open and close capability of the valve before resumption of electric power generation.

Basis for Relief:

The paragraphs referenced above require in-situ testing of Class 1 Main Steam Pressure Relief Valves with auxiliary actuating devices. Paragraph I.3.2.1 applies to testing after installation, but prior to power generation, of valves not of the same manufacture and type. Paragraph I 3.4.1(d) provides requirements following maintenance or periodic testing of valves after they have been in service. Relief is requested from both requirements because both will apply during the 2nd Interval.

The testing specified above has been determined to be detrimental to the leak tight integrity of the valves and creates a condition which could threaten plant safety. If any of these valves failed to reclose after testing, the plant would be placed in a condition equivalent to a LOCA. Depending on the severity of the failure, this could range from a small-break equivalent up to a fairly substantially sized break (i.e., 6-inch). Even relatively small amounts of leakage could require a plant shutdown based on Technical Specification leakage limits or Suppression Pool temperature requirements.

BWR Owner's Group Evaluation of NUREG-0737, Item II.K.3.16, "Reduction of Challenges and Failures of Relief Valves" recommended that the number of ADS openings be reduced as much as possible. Recent ASME Code development has recognized that unnecessary challenges to ADS valves should be avoided. NUREG-1482, Section 4.3.4, references NUREG-0123 and NUREG-0626, in which the NRC staff also recommended reducing the number of challenges to dual-function ADS valves.

Adequate demonstration of ADS/SRV operability is still provided by periodic SRV testing to ASME OM Code-1990, Appendix I, and additional ADS surveillance testing.

RELIEF REQUEST NO. 41-VRR-6, REVISION 0 (cont.)

Alternate Testing:

The testing described in this section includes both Code-compliant and alternate (TS surveillance) testing in order to present an integral description of the program of tests applied to ADS valves.

The valves covered by this relief request are pilot-actuated safety/relief valves. Following their placement into service, these valves shall be periodically tested in accordance with all applicable requirements of Appendix I of the ASME OM Code-1990 for Class 1 Main Steam Pressure Relief Valves with auxiliary actuating devices, except as stated in this relief request. In accordance with Technical Specification Surveillance Requirement 4.4.2.2, once per 24 months, at least 1/2 of the safety relief valves shall be removed, set pressure tested and reinstalled or replaced with spares that have been previously set pressure tested. Testing shall be performed on the entire valve, including the main seat and pilot assemblies, at a certified test facility, using steam as the test medium.
The as-found set pressure testing of the removed valves in accordance with ASME OM Code-1990 ensures that the main disc can freely operate.

In addition the following surveillance testing is performed on the ADS valves:

A. MSRV Cyclic Test
This test, performed each refuel and each time maintenance is performed on the SRV, verifies proper operation of the ADS solenoid valves, air operator and pilot assembly.

B. ADS Leak Test
This test, performed each refuel and each time maintenance is performed on the ADS valve, verifies that ADS instrument gas/accumulator leakage is low enough to ensure that there will be sufficient pneumatic pressure for design basis ADS/SRV operation.

C. ADS Logic System Functional Testing
Division 1 and 3 ADS logic system functional testing as required by TS Sections 3.3.3 and 4.5.1d.2a verifies the ECCS logic for actuating the ADS, not including actual stroking of the instrument gas/accumulator solenoids.

The combined ASME OM Code-1990, Appendix I and Technical Specification surveillance tests described above verify all required ADS critical component performance requirements.