

February 14, 2001

MEMORANDUM TO: James W. Clifford, Section Chief
Project Directorate I-2
Division of Licensing Project Management, NRR

FROM: Robert L. Dennig, Section Chief */RA/*
Content and Applications Section
Technical Specifications Branch (RTSB)
Division of Regulatory Improvement Programs, NRR

SUBJECT: LIMERICK GENERATING STATION, UNITS 1 AND 2 - ISSUANCE OF
AMENDMENTS REGARDING AUTOMATIC DEPRESSURIZATION
SYSTEM SURVEILLANCE REQUIREMENTS (TAC NOS. MB0027 AND
MB0028)

Plant Names: Limerick Generating Station, Units 1 and 2
Utility: PECO Energy Company
TAC Numbers: MB0027, and MB0028
Docket Numbers: 50-352 and 50-353
Project Directorate: PD I-2
Project Manager: C. Gratton
Review Branch: RTSB
Review Status: Completed

PECO Energy Company, the licensee, submitted a request, by letter dated July 31, 2000, for an amendment to the technical specifications for Limerick Generating Station (LGS) Units 1 and 2 regarding changes to the Automatic Depressurization System Surveillance Requirements.

The amendments revise LGS Technical Specifications to replace the existing Automatic Depressurization System (ADS) TS Surveillance Requirement (SR) 4.5.1.d.1, a 31 day channel functional test of the accumulator backup compressed gas system low pressure alarm system, with a 31 day verification of the ADS accumulator gas supply header pressure. The existing TS SR 4.5.1.d.1 and SR 4.5.1.d.2.c, a 24 month channel calibration of the accumulator backup compressed gas system low pressure alarm system, is to be relocated to the Technical Requirements Manual (TRM).

A copy of the Safety Evaluation is enclosed. This completes RTSB review and work on TACs MB0027, and MB0028

Attachments: as stated

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. _____ TO FACILITY OPERATING LICENSE NO. NPF-39

AND AMENDMENT NO. _____ TO FACILITY OPERATING LICENSE NO. NPF-85

PECO ENERGY COMPANY

LIMERICK GENERATING STATION, UNIT 1 AND UNIT 2

DOCKET NOS. 50-352 AND 50-353

1.0 INTRODUCTION

PECO Energy Company (PECO Energy) is requesting Technical Specifications (TS) changes which will revise Limerick Generating Station (LGS) TS to replace the existing Automatic Depressurization System (ADS) TS Surveillance Requirement (SR) 4.5.1.d.1, a 31 day channel functional test of the accumulator backup compressed gas system low pressure alarm system, with a 31 day verification of the ADS accumulator gas supply header pressure. The existing TS SR 4.5.1.d.1 and SR 4.5.1.d.2.c, a 24 month channel calibration of the accumulator backup compressed gas system low pressure alarm system, will be relocated to the Technical Requirements Manual (TRM).

2.0 BACKGROUND

Fundamentally, approval of the license amendment request (LAR) will have two effects: (1) the equipment used for determining TS OPERABILITY of key safety components will be changed and (2) this change will eliminate the chance of an unnecessary forced reactor shutdown in 12 hours that would result from failure of that equipment under the current TS.

The LAR does not change in any way the design or operation of any safety or non-safety related systems/components previously reviewed by the NRC staff and found to be acceptable, in particular the ADS. What the LAR proposes is an alternate means of assuring the OPERABILITY of the ADS valves:

Replace Emergency Core Cooling System (ECCS) ADS TS SR 4.5.1.d.1, performing a Channel Functional Test at least once per 31 days of the accumulator backup compressed gas system low pressure alarm system, with a new TS SR 4.5.1.d.1, verifying at least once per 31 days that the ADS accumulator gas supply header pressure is ≥ 90 psig.

In deciding the acceptability of this element of the LAR, we used the following requirements, guidance, and information:

- (1) The definition of OPERABILITY in the LGS TS,

Attachment

- (2) The definition of SR in 10 CFR Part 50.36(c)(3),
- (3) The description of the design basis function of the ADS valves as discussed in LGS TS bases,
- (4) The description of the ADS and its air supply system as provided in the LAR; and
- (5) Precedent as contained in NUREG-1433, Revision 1, "Standard Technical Specifications, General Electric Plants, BWR/4" dated April 1995.

The alternative means of assuring operability of the ADS valves eliminates reliance on the accumulator backup compressed gas system low pressure alarm system for Limiting Condition for Operation (LCO) 3.5.1.d. It follows that any SRs for that LCO using that system can be deleted. Thus, in addition to the change in SR 4.5.1.d.1, the LAR proposes a related deletion:

Delete ECCS ADS TS SR 4.5.1.d.2.c, performing a Channel Calibration at least once per 24 months of the accumulator backup compressed gas system low pressure alarm system.

As a result, the ongoing operation and maintenance of the accumulator backup compressed gas system low pressure alarm system would no longer be required by LGS TS. Instead the LAR would:

Relocate the existing SR 4.5.1.d.1 (Channel Functional Test) and SR 4.5.1.d.2.c (Channel Calibration) to the Technical Requirements Manual (TRM).

The TRM is a licensee controlled document that can be changed without the NRC staff review if the change meets the test of 10 CFR Part 50.59. In deciding whether an item can be removed from the TS, the staff NRC staff uses 10 CFR Part 50.36(c)(2) LCO, which spells out what equipment must be included in TS. Given a finding that the accumulator backup compressed gas system low alarm system is not required for ADS valve OPERABILITY, does it serve any other purpose that requires it to remain in TS? If not, relocation to the TRM is acceptable.

Finally, the LAR includes conforming changes to the TS Bases. We reviewed these for agreement with the reasoning in support of its TS, but we are not required to formally accept or approve them.

3.0 EVALUATION

The ADS at Limerick requires the operation of five of the fourteen main steam safety relief valves (MSRVs). These five MSRVs are referred to as the ADS valves. All of the pilot operated MSRVs are self-actuated for automatic overpressure protection of the reactor vessel and attached piping, and can also be remotely actuated via main control room hand switches. The five ADS valves can also be remotely actuated automatically or manually via the ADS control logic. The remote actuation of the MSRVs requires the application of an external compressed gas supply to the MSRV actuators. This gas pressure is normally supplied by the primary containment instrument gas (PCIG) system.

The PCIG system consists of two non-safety related compressor packages with separate receiver tanks and two separate supply loops. Each of these loops split into two separate headers outside of containment and each header has a separate containment penetration. One header from each loop is designed as a separate safety-related and seismic Category 1 supply to the appropriate ADS valves (three ADS valves are supplied from the A loop header and two ADS valves are supplied from the B loop header). The other two headers are non-safety related and non-seismic Category 1 and both of these headers are each hard piped inside of containment to the nine non-ADS MSRVs. These headers are also hard piped to the ADS valves such that either the 'A' PCIG loop or the 'B' PCIG loop can provide the gas supply to each of the five ADS valves when either of the PCIG compressors and/or receiver tanks are adequately pressurized. The instrument air system and the station compressed air system can also be aligned to the PCIG system as backup pneumatic sources.

The PCIG system also includes a backup compressed gas system that consists of two additional safety-related backup headers in the reactor enclosure, with each header connected to three standard 2200 psi nitrogen bottles with regulators. Each backup header is connected to one of the two safety-related PCIG supply headers outside of containment and is normally isolated from the PCIG supply header by a normally closed solenoid valve (fail open). When the normal PCIG supply header pressure drops to 85 psig, the solenoid valve on the backup header opens and another solenoid valve on the PCIG supply header closes and isolates the safety-related portion of the PCIG supply header and the safety-related backup header from the non-safety related portion of the PCIG supply header. This re-alignment connects the backup supply bottles to the ADS valves and accumulators inside containment. Each set of three bottles provides sufficient gas volume to assure up to 100 actuations of the ADS valves on that header. This satisfies the short term need for ADS control (i.e., six hours through day seven of an accident) without any operator action outside of the control room. During this time period, additional bottles or a compressor can be connected to the safety-related external connection (outside of the reactor enclosure) which is provided at the end of one backup supply header. This external connection will allow for long term safety-related makeup for up to 100 days if required.

The backup compressed gas system includes a low pressure alarm system. This alarm function is provided by pressure switches installed on the 'A' and 'B' ADS accumulator backup compressed gas supply headers. These switches initiate the low pressure alarms in the main control room when the gas pressure in either of the backup supply headers decreases to below 90 psig. These alarms are for indication only and do not impact the operation, capability or operability of the ADS accumulators since a loss of pressure in the backup header does not indicate a loss of pressure in the ADS accumulator supply header or the ADS accumulators due to the normally closed solenoid valve in the backup header.

The current ECCS TS surveillance requirements link a channel functional test and calibration of the ADS accumulator backup compressed gas low pressure alarm system to the TS operability of the ADS. Since there is no TS allowed out-of-service time for the alarm system, a failure of the alarm test requires entering a 12 hour shutdown ACTION statement for two or more ADS valves inoperable (TS LCO 3.5.1.d.2). However, a plant shutdown based on a failure of this alarm is not appropriate. As indicated previously, the alarm is for indication only and does not impact the operation, capability or operability of the ADS accumulators. The design basis for ADS, as described in the ECCS TS Bases 3/4.5.1, is to depressurize the reactor vessel so that

flow from the low pressure core cooling systems can enter the core in time to limit fuel cladding temperature to less than 2200°F. A loss of pressure in the backup header does not indicate a loss of pressure in the ADS accumulator supply header or the ADS accumulators due to the normally closed solenoid valve in the backup header. Without a loss of pressure in the ADS accumulators, the ADS valves are fully capable of meeting the ADS depressurization function described in the TS Bases. Therefore, the appropriate parameter to monitor is the ADS accumulator gas supply header pressure.

The licensee has proposed to revise the following changes and clarifications to the TSs:

Replace ECCS ADS TS SR 4.5.1.d.1, performing a Channel Functional Test at least once per 31 days of the accumulator backup compressed gas system low pressure alarm system, with a new TS SR 4.5.1.d.1, verifying at least once per 31 days that the ADS accumulator gas supply header pressure is ≥ 90 psig. This new surveillance requirement ensures that the ADS valves are capable of performing the ADS depressurization function described in ECCS TS Bases 3/4.5.1.

Delete ECCS ADS TS SR 4.5.1.d.2.c, performing a Channel Calibration at least once per 24 months of the accumulator backup compressed gas system low pressure alarm system.

Add to TS Bases 3/4.5.1 and 3/4.5.2, the bases for the new SR verification of the ADS accumulator gas supply header pressure.

Relocate the existing SR 4.5.1.d.1 (Channel Functional Test) and SR 4.5.1.d.2.c (Channel Calibration) to the TRM.

The current LGS ECCS TS Surveillance Requirements for the ADS includes the performance of a Channel Functional Test at least once per 31 days and a Channel Calibration at least once per 24 months of the ADS accumulator backup compressed gas system low pressure alarm system. This alarm function is provided by pressure switches installed on the 'A' and 'B' ADS accumulator backup compressed gas supply headers. These switches initiate the low pressure alarms in the main control room when the gas pressure in either of the backup supply headers decreases to below 90 psig. These alarms are for indication only and do not impact the operation, capability or operability of the ADS accumulators in supporting the TS required ADS depressurization function. A loss of pressure in the backup header does not indicate a loss of pressure in the ADS accumulator supply header or the ADS accumulators due to the normally closed solenoid valve. Without a loss of pressure in the ADS accumulators, the ADS valves are fully capable of meeting the ADS depressurization function described in the ECCS TS Bases 3/4.5.1. The proposed TS verification that the pressure in the ADS accumulator compressed gas header is at least equal to the ADS accumulator's minimum required charging pressure of 90 psig, is a direct indication that the pressure in the ADS accumulators meets the design basis and that the ADS valves are fully capable of performing the TS required ADS depressurization function for the initial six hours of an event. The proposed surveillance frequency is in accordance with NUREG-1433, Rev. 1, Surveillance Requirement 3.5.1.3 and allow the equipment to meet its intended function of as stated in the LGS definition of OPERABILITY. Therefore the staff finds this change acceptable.

Including the channel functional test and channel calibration requirements for the ADS long term backup gas supply system alarm system in the TRM will ensure that the long term gas supply system continues to meet its design requirements specified in the UFSAR and in addition will be governed by the requirements stated 10 CFR Part 50.59. In addition, this will help to eliminate potential confusion regarding TS operability of the ADS valves if the long term gas supply system is unavailable. Allowed outage times and appropriate actions for when portions of the long term gas supply to the ADS valves become unavailable are also being included in the TRM. In deciding whether an item can be removed from the TS, the staff NRC staff uses 10 CFR Part 50.36(c)(2) LCO, which spells out what equipment must be included in TS. The accumulator backup compressed gas system low alarm system is not required for ADS valve OPERABILITY according to the LGS definition of OPERABILITY or 10 CFR Part 50.36(c)(2) and does not serve any other purpose that requires it to remain in TS. The relocation of SR 4.5.1.d.1 and SR 4.5.1.d.2.c to the TRM and the deletion of SR 4.5.1.d.2.c is acceptable.

The proposed change was evaluated by the licensee in relation to the LGS Probabilistic Safety Assessment (PSA). The licensee concluded that the change has no impact on core damage frequency since the ADS depressurization function is not impacted by the proposed change. In addition, these changes as stated above are consistent with the requirements in NUREG-1433 Standard Technical Specification General Electric Plants, BWR/4 and have been adopted by several other plants recently during Improved Technical Specification (ITS) conversions.

4.0 SUMMARY

The NRC finds that the proposed changes will allow safe operation with these modifications to the ADS TS Surveillance Requirement. The NRC staff also finds that the proposed changes are consistent with the previously approved ITS conversions to NUREG-1433, Revision 1. The NRC staff, therefore, concludes that the proposed TS changes are acceptable.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Pennsylvania State official was notified of the proposed issuance of the amendments. The State official had no comments.

6.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and change surveillance requirements. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (64 FR 67337). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

7.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (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 amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: J. Foster

Date: