

December 12, 1996

NOTE TO: Docket File 50-352/353

FROM: Joseph W. Shea, Project Manager /S/
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

SUBJECT: BACKGROUND DOCUMENT REGARDING EVENT REPORT ON FIRE PROTECTION ANALYSIS ASSUMPTIONS FOR SAFETY RELIEF VALVE OPERATION, LIMERICK GENERATING STATION, UNITS 1 AND 2

The attached document was provided by PECO Energy Company on December 10, 1996. The document discusses the licensee's response to concerns with the operation of main steam safety relief valves in the event of certain postulated fires at Limerick Generating Station. The concerns were reported to the NRC in an event notification (Event Number 31416) on December 6, 1996. The material responds to verbal questions posed by the staff to the licensee upon receipt of the event notification.

Please place the attached document in the Limerick Generating Station Docket File.

Attachment: As stated

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UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

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A handwritten signature in cursive script, appearing to read "Joseph W. Shea", written over the typed name in the "FROM:" field.

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ANALYSIS ASSUMPTIONS FOR SAFETY RELIEF VALVE OPERATION, LIMERICK
GENERATING STATION, UNITS 1 AND 2

The attached document was provided by PECO Energy Company on December 10, 1996. The document discusses the licensee's response to concerns with the operation of main steam safety relief valves in the event of certain postulated fires at Limerick Generating Station. The concerns were reported to the NRC in an event notification (Event Number 31416) on December 6, 1996. The material responds to verbal questions posed by the staff to the licensee upon receipt of the event notification.

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Background

The inability to depressurize via the Main Steam Relief Valves (MSRVs) controlled from the Remote Shutdown Panel (RSP) has no effect on the Unit(s) ability to achieve Hot Shutdown. Per regulation, Cold Shutdown must be achieved within 72 hours following the fire event. Fire Areas 22 (Unit 1 Cable Spreading Room), 23 (Unit 2 Cable Spreading Room), 24 (Common Main Control Room), 25 (Auxiliary Equipment Room) are the only Fire Areas for which the Remote Shutdown method is required. Several other methods of depressurization control are proceduralized and included for operator training including Automatic Depressurization System (ADS), High Pressure Coolant Injection (HPCI), Reactor Core Isolation Cooling (RCIC), and several balance of plant systems (e.g.: Main Turbine Bypass Valves, Reactor Feed Pump Turbines, Steam Jet Air Ejectors, etc.).

With the exception of RCIC, these redundant depressurization methods have not been shown to satisfy the separation criteria of BTP CMEB 9.5.1 (C.5.a), Revision 2. Based on this lack of demonstrated separation, Technical Requirements manual (TRM) Section 3/4.7.7 "Fire Rated Assemblies" is not satisfied. The action statement requires continuous fire watches for areas without operable detection, and hourly firewatches for areas with operable detection. All of the affected fire areas are protected by smoke detection. In addition, the Auxiliary Equipment Room is protected by automatic under-floor halon which also protects the individual equipment panels. The Cable Spreading Rooms are protected by automatic sprinklers and manually-initiated total flooding CO₂. The Main Control Room is protected by manual CO₂ hose reels, and is continuously manned (a continuous firewatch). Strict transient combustible controls are in place in these Fire Areas, in addition, the Cable Spreading Rooms are designated as Transient Free Zones.

The ability to maintain Hot Shutdown indefinitely is assured, since RCIC and the Suppression Pool Cooling Mode of RHR are protected for the Remote Shutdown scenario. To achieve Cold Shutdown existing Trip procedures provide for the low pressure operation of the RCIC system (T-101 and T-247), allowing a direct transition to the Shutdown Cooling mode of RHR, without the operation of the Main Steam Relief Valves. The Shutdown Cooling mode of the RHR system is also protected for the Remote Shutdown scenario.

Based on the defense in depth philosophy, discussed in BTP CMEB 9.5.1 (B.1), Revision 2, a reduction in one defense echelon may be accommodated by a heightened level of protection somewhere else ("...strengthening any one can compensate in some measure for weaknesses, known or unknown, in the others."). The action above of adding a firewatch to the existing detection and suppression systems and alternative depressurization methods are in accordance with this philosophy.

Since the provisions of the Fire Protection Program, as described in the Limerick Generating Station Fire Protection Evaluation Report has not been maintained (license condition 2.C.3), the NRC was notified per Operating License section 2.F

1. Has the Licensee developed temporary procedure(s) to instruct the operators on regaining air/gas to the valves?

Guidance is provided to the operators using existing EOP's therefore, no temporary procedures have been initiated. Remote shutdown and alternative shutdown share the same panels at LGS. Existing EOP's (SE-1-1, SE-6) which are based from the RSP provide guidance to either establish alternate sources of compressed air, or utilize accumulator-supplied ADS valves (these alternatives were reinforced via a Shift Training Bulletin issued 12/06/96). This temporary resolution to the noncompliance is preferred, since the operators have been trained in the EOPs and are familiar with their use. The alternate methods of de-pressurizing include equipment that under the postulated scenario would not remain free of fire damage because adequate separation between the redundant equipment is not maintained. In addition to the fixed fire suppression available, a fire watch (compensatory measure) has been implemented to augment the local fire detection located within the plant areas of concern and provide an early warning for the manual fire fighting team. This compensatory measure has been deemed appropriate for temporary situations where less than adequate separation exists.

2. Are any temporary repairs (plant changes) needed?

Based on the availability of proceduralized redundant methods of depressurization, no temporary plant change or additional staging of equipment for a safe shutdown (cold) repair is required to perform the depressurization function. In addition, significant time is available to achieve cold shutdown (up to 72 hours) such that expert guidance from the TSC and maintenance resources would be available to effect a repair, if needed, following fire damage. Until the permanent plant change is implemented, hourly fire watches are enhancing the area fire detection in the MCR, CSR, and AER due to inadequate redundant train separation.

3. If other methods of depressurization are to be used, are they free from fire damage?

The equipment available to: (1) achieve safe shutdown, (2) remain free from fire damage, and (3) be separated from the redundant train for the fire areas of concern, must be controlled from the remote shutdown panel. The ability to maintain Hot Shutdown indefinitely is assured, since RCIC and the Suppression Pool Cooling Mode of RHR are protected for the Remote

Shutdown scenario. To achieve Cold Shutdown, existing Trip procedures provide for the low pressure operation of the RCIC system (T-101 and T-247), allowing a direct transition to the Shutdown Cooling mode of RHR, without the operation of the Main Steam Relief Valves. Tech Spec table 3.3.2-2 allows RCIC operation down to 64.5 psig steam pressure. The Shutdown Cooling mode of the RHR system is also protected for the Remote Shutdown scenario.

4. Has a 50.59 review been completed? If so, the NRC wants to see it.

The temporary solution to the noncompliance has neither required a physical plant change nor a change to a procedure therefore, a 50.59 determination or safety evaluation has not been performed. The permanent solution to the noncompliance requires both a physical plant change and a change to a procedure and as appropriate, the 50.59 review(s) will be performed.

5. What are the permanent fixes?

Currently being evaluated is a design for a Cold Shutdown repair to allow the ADS nitrogen gas bottles to back-up the Primary Containment Instrument Gas (PCIG) header. This design requires the permanent installation of a fitting in the PCIG header to enable the connection of bottled gas and the staging of equipment necessary to connect the gas bottle to the PCIG header.