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

SUBJECT: Limerick Generating Station, Units 1 and 2
Main Steam Safety Relief Valve/Emergency Core Cooling System Action Plan

On September 11, 1995, Limerick Generating Station (LGS), Unit 1, was manually scrammed in response to an unexpected opening of a Main Steam Safety Relief Valve (MSRV) when the valve could not be closed within two minutes. During the response to this event, Operations observed indications of suction strainer fouling on the Residual Heat Removal (RHR) pump being used for suppression pool cooling. Inspection of the MSRV revealed that steam erosion due to pilot disc leakage resulted in failure of the pilot valve which equalized pressure across the main disc and caused the valve to open. Inspection of the RHR pump suction strainer identified a brown, fibrous material covering approximately 70% of the strainer. Chemical analysis identified the material as polypropylene fibers, and iron and zinc oxide corrosion products. The polypropylene fibers are not a constituent of any permanent Primary Containment equipment.

On September 13, 1995, the NRC sent a team of three inspectors to LGS to review the details of these two events, including PECO Energy Company's identification of the causes and corrective actions. On September 21, 1995, the NRC Team conducted their inspection exit meeting, and requested that PECO Energy provide the NRC with a letter describing the details of the following action plans for LGS, Units 1 and 2: 1) MSRV tailpipe temperature, 2) Emergency Core Cooling System (ECCS) pump suction strainer differential pressure, and 3) suppression pool water cleanliness. The Attachment to this letter provides the details of these action plans.

If you have any questions or require additional information, please contact us.

Very truly yours,

Walter G. MacFarland

Attachment

cc: T. T. Martin, Administrator, Region I, USNRC w/attachment
N. S. Perry, USNRC Senior Resident Inspector, LGS "

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Main Steam Safety Relief Valve (MSRV) Tail Pipe Temperature Action Plan

For any MSRV temperature ≥225°F (Alert Level):

Operations shall log the affected MSRV tail pipe temperature every 12 hours while operating at power (and every six hours during startup).

Engineering shall trend the affected MSRV tail pipe temperature versus time and project when the temperature is expected to reach 275°F. This projection shall be based on historical trends (of the Unit 1 "M" MSRV from March 1994 to September 1995) and industry experience. In addition, preparations for a planned outage to replace the affected MSRV will be initiated.

For any MSRV temperature ≥250°F (Action Level):

Based on tail pipe temperature trends and suppression pool heat input, Engineering shall provide specific recommendations of when to schedule a planned outage to replace the affected MSRV, i.e., before the MSRV tail pipe temperature is expected to reach 275°F. In the event of sudden and significant temperature increases, operability of the affected MSRV would be evaluated along with potential mitigating actions.

Basis:

The alert level of 225°F was selected since it represents a minor MSRV leak (i.e., approximately 20 lbm/hr).

The action level of 250°F was selected since it represents a more significant MSRV leak (i.e., 500-1000 lbm/hr). However, based on historical tail pipe temperature trends, there is adequate time to schedule a planned outage to replace the affected MSRV. The Unit 1 "M" MSRV lift event occurred after the tail pipe temperature gradually increased to 295°F over an 18 month period of time due to severe pilot stage leakage and erosion. In particular, the rise in tail pipe temperature from 250°F to 275°F took over nine (9) months. Additionally, from a suppression pool heat-up standpoint, 250°F is a conservative action level based on analysis that if all 14 MSRV's leaked on a particular unit at 1000 lbm/hr per MSRV, the resultant heat input would be well within the capability of the suppression pool cooling system.

The temperature of 275°F was selected since this temperature provides adequate margin to 295°F based on historical tail pipe temperature trends for conducting a planned orderly shutdown to replace the affected MSRV. For example, the Unit 1 "M" MSRV tail pipe temperature rise from 275°F to 295°F took six months.

Sudden and significant increases in MSRV tail pipe temperatures are atypical. The pilot stage steam erosion of the significance that led to the Unit 1 "M" MSRV lifting event would take a long period of time to occur.

The temperature levels specified above apply for MSRV pilot stage leakage which is the worst case MSRV leakage condition, and one which in the most severe condition could potentially lead to spurious MSRV actuation. Since Limerick Generating Station (LGS) as currently configured cannot distinguish between pilot stage versus main seat leakage, all MSRV leakage shall

conservatively be assumed to be pilot stage leakage and the above plan shall be followed. A design change to distinguish between pilot stage versus main seat leakage shall be evaluated. If such a design change is determined to be feasible, and is successfully incorporated, this MSRV Tail Pipe Temperature Action Plan shall only apply to MSRV pilot stage leakage.

Emergency Core Cooling System (ECCS) Pump Suction Strainer Differential Pressure Action Plan

Current ECCS/Reactor Core Isolation Cooling (RCIC) Pump, Valve and Flow (PV&F) operability tests shall trend suction strainer differential pressure (DP) values versus baseline suction strainer values. An increase of 0.5 psid for the suction strainer will currently be the alert level. At this level, Engineering shall perform an evaluation to project when the affected ECCS suction strainer DP will reach the maximum allowable DP based on DP versus time trends, and shall recommend appropriate actions.

The maximum allowable DP across an ECCS/RCIC pump suction strainer is that required to satisfy design net positive suction head requirements at rated flow. The specific design calculations are currently being reviewed by Nuclear Engineering Division. The finalized action values will be available by November 1, 1995. This acceptance criteria shall be incorporated into each ECCS/RCIC PV&F operability test. If any value is exceeded, the associated ECCS shall be declared inoperable and the appropriate Technical Specifications (TS) action followed.

In special circumstances where extended operation of an ECCS pump is required, such as suppression pool cooling mode of the Residual Heat Removal (RHR) system, additional suction strainer data trending will be evaluated and recommended by Engineering.

Suppression Pool Water Cleanliness Action Plan

Chemistry shall sample and trend suppression pool water for fibrous content on a monthly basis. This fiber sampling will be used for information only. Actions shall only be taken on the basis of suction strainer DP as described above.