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April 19, 1985

Docket Nos. 50-352
50-353

Mr. Richard W. Starostecki, Director
Division of Reactor Projects
United States Nuclear Regulatory Commission
Region 1
631 Park Avenue
King of Prussia, PA 19406

SUBJECT: Limerick Generating Station, Units 1 and 2
Technical Review of the AC and DC Electric
Power Systems by Brookhaven National Laboratory (BNL)

REFERENCE: Letter, R. W. Starostecki to S. L. Daltroff
dated March 21, 1985

Dear Mr. Starostecki:

This letter provides Philadelphia Electric Company's response to the subject letter. We believe that BNL's selection of these systems for their technical review is a credible use of the Probabilistic Risk Assessment (PRA).

Response to Open Items listed in Section 12.1 of the BNL Report

In accordance with our discussion with R. M. Gallo of your staff April 15, 1985, our staff will be prepared to discuss the following open items listed in Section 12.1 of the BNL Technical Report during the BNL inspection scheduled for the the week of April 22, 1985.

1. Loose metal components in 4KV switchgear.

2. Broken floor grating in Diesel Generator (D/G) rooms.

3. D/G ventilation panel labels.

4. Debris in D/G rooms.

6. Alarm response cards for local safety related panels.

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11. D/G vent fan discharge damper position/indication.

13. Refueling cycle D/G maintenance procedures.

14. Vendor recommended D/G operational checks.

15. D/G physical condition discrepancies.

16. Verification of D/G cooling system within design limits.

17. Trending of D/G operating parameters not performed.

19. Loss of offsite power procedure items.

20. Station blackout procedure items.

Our comments and actions addressing the remainder of the open items listed in Section 12.1 of the BNL Technical Review report are as follows:

5. Battery Charger Load Testing Less Than Required.

Response

The apparent discrepancy exists because the wording used to describe the load in Preop Test 2.1 is incomplete. It should state its purpose as a verification that the charger can recharge the battery from a fully discharged condition while supplying normal, shutdown, or post accident loads. The fact that the test did prove this capability is evident based on a comparison of the load values used in the preop test against FSAR Tables 8.3-18 through 8.3-26, which list the emergency loads. This comparison shows that the loads used encompassed the normal, shutdown or post accident loads.

7. Sufficient Completion of 33KV Offsite Power Source.

Response

Section 8.2.1.1 of the Limerick FSAR describes the 33KV line as a potential third offsite source for emergency use in the event that either of the normal offsite sources is lost. The degree of completion of this potential offsite source is further explained in FSAR Section 8.2.1.1 as follows:

a) A spare 14MVA 13.2/33-4.16KV transformer is located onsite.

b) Underground conduit is installed to connect each safeguard transformer location with the 33KV circuit breaker terminal yard.

The work required to complete the installation is recognized in FSAR Section 8.2.1.1 as follows:

a) The faulty safeguard transformer will be removed and physically replaced by the spare.

b) 33KV cable will be pulled into the underground conduit.

c) A 33KV aerial tap will be made.

d) Reconnection of control and protective relaying is required.

Paragraph 8.2.1.1 does not state that the control and protective relay wiring would be previously installed. It states that in the event of a failure of either Unit 1 or Unit 2 safeguard transformer requiring a repair time greater than 72 hours, the faulty transformer will be removed and physically replaced by the spare.

The reference to a 72 hour restoration time in FSAR Section 8.2.1.1 is intended as Philadelphia Electric Company's estimate of a reasonable time period for accomplishing the required actions to connect the third offsite power source to avoid the shutdown that is required by the Technical Specifications upon loss of one offsite power source. Technical Specification 3.8.1.1 establishes that two offsite sources are a limiting condition for operation for operational conditions 1, 2, and 3. Action 3.8.1.1.f requires the plant to be removed from service to at least hot shutdown within 12 hours and cold shutdown within 24 hours after the initial 72 hours allowed for the restoration of two offsite power sources. The provision for the third offsite power source is only to maximize plant availability should equipment failure cause a long-term loss of one of the existing offsite sources. Therefore, no credit has been taken in any accident analysis for the 72 hour restoration.

8. Physical Independence of 33KV and 220KV Sources.

Response

As shown in FSAR Figure 8.2-3, the 33KV feed to the plant transformer does not go through the 220KV switchyard. A radial feed from the 33KV line provides auxiliary power to the 220KV switchyard. This radial feed is one of 3 sources of auxiliary power, and all auxiliary load in the switchyard can be powered from either of the other two sources. The radial feed is aerial to a point immediately inside the switchyard fence where it makes a transition to underground duct. If it becomes necessary to use this potential offsite source, the present feed to the switchyard auxiliary equipment will be disconnected, an aerial tap made, and cables to the 33KV oil circuit breaker and the replacement transformer will be pulled through existing duct. With the exception of the auxiliary power feed, which will be disconnected if it is used as an offsite source, there is no other 220KV substation equipment in close proximity to the 33KV circuit.

We believe that the potential 33KV offsite source meets the physical separation requirements of General Design Criteria 17 of 10 CFR 50 Appendix A.

9. Switchyard Disconnect Position.

Response

Limerick electrical drawing E-1, Rev. 12 shows disconnect switches Nos. 4B7 and 4B5 open with an associated note, "Blocked Open". Procedure S35.8.0 Rev. 0 calls for disconnect switch No. 4B7 to be closed. Our review of this discrepancy has concluded that it is acceptable for either one or both of these switches to be open to block power flow via the 4B autotransformer. Therefore, it is of no operational consequence that disconnect switch No. 4B7 was closed rather than open. Accordingly, Philadelphia Electric Company has taken action to remove the note "Blocked Open" from drawing E1.

10. D/G Vent Fan Capability and D/G Operability.

Response

In accordance with our commitment to the BNL technical specialist during his tour, an engineering evaluation, which shows that for outside temperatures up to 75 degrees Fahrenheit one fan will suffice, has been formally transmitted to Limerick Generation.

12. D/G Exhaust into Reactor Building Ventilation Intake.

Response

The phenomena of diesel generator exhaust gases entering the reactor enclosure intakes was first observed during preoperational testing. While this problem is not a nuclear safety concern (since the reactor enclosure intakes will isolate upon a LOCA signal), a concern has been expressed by Philadelphia Electric Company regarding the potential personnel hazards of inhaling the exhaust fumes and the spurious fire alarms which result from the presence of smoke inside the reactor enclosure.

A program was developed by Philadelphia Electric Company to determine a cost-effective solution to this problem. The program consisted of wind tunnel model testing to determine the optimum stack configuration, analysis of the results to determine the critical windspeeds and directions, and implementation of modifications to the exhaust stacks.

The results of the wind tunnel testing have shown that an unimpeded vertical discharge of the effluent will produce a substantial decrease in exhaust concentrations at the reactor enclosure intakes. Modification Design Change Package (MDCP) No. 416, Revision 1, has therefore been issued to remove the existing 90 degree elbows on the exhaust stacks above the diesel generator roof leaving a 7-1/2 foot vertical stack. The MDCP also includes appropriate automatic drainage provisions on the exhaust silencers to ensure the continuous removal of water which may accumulate at the base of the stacks. This MDCP is currently being implemented in the field, with completion on all four diesel generator units expected by April 30, 1985. Further extension of the stack height will be considered based on additional analysis of test results and operating experience.

18. Positioning of ESW Throttle Valve for D/G Cooling.

The Emergency Service Water (ESW) return from each diesel generator skid passes through a manual globe valve (11-1005A, B, C, D, as applicable). The inspection report presented three finding related to these valves.

a) The Limerick Probabilistic Risk Assessment (PRA) AC Power fault trees lists the valves as normally open-fail closed.

Response

Figure 8, Sheet 4 of 11 of the Limerick PRA System Level Fault Trees correctly shows a normal open-fail closed designation for these valves. This is an analytical convention intended to assign a numerical probability (for PRA analysis) associated with the possibility of flow interruption due to mispositioning of this valve, or failure of the valve stem in the closed position. Analogous conventions are used throughout all System Level Fault Trees for representing the probability of failure associated with manual valves.

b) Procedure S11.1.A Check Off List-1 (COL-1) states that the valves for the 4 D/G's are throttled open (2-1/8, 2, 2-1/10, and 2 turns respectively).

Response

The Emergency Service Water System requires flow balancing (throttling of certain manual valves) to ensure that adequate cooling water flow is provided to all heat exchangers in the system. Procedure S11.1.A (COL-1) indicates the currently approved positions of these valves based upon system flow analyses and flow balancing test results.

c) Procedure S92.1.N (COL-1) states that these valves are open (i.e., full open).

Response

Procedures S92.1.N (COL-1, 2, 3, 4), which are the individual diesel generator checkoff lists, will be revised to reflect the appropriate positions of these valves as listed in S11.1.A (COL-1).

If you should have any questions, please do not hesitate to contact us.

Very truly yours,

cc: J. T. Wiggins, Site Inspector
A. Schwencer, Division of Licensing, USNRC
(See Attached Service List)

cc: Judge Helen F. Hoyt
Judge Jerry Harbour
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