PECO NUCLEAR

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Ms. Mary Drouin
Office of Nuclear Regulatory Research
Mail Stop T-10 E50
United States Regulatory Commission
Washington, DC 20555-0001

Subject: Comments Concerning Draft NUREG-1560, "Individual Plant Examination Program: Perspectives on Reactor Safety and Plant Performance"

Dear Ms. Drouin:

This letter is being submitted in response to an NRC request for comments regarding draft NUREG-1560, "Individual Plant Examination Program: Perspectives on Reactor Safety and Plant Performance." This request for comments on draft NUREG-1560 was published in the Federal Register (i.e., 61FR58429, dated November 14, 1996). PECO Energy appreciates the opportunity to comment on this draft NUREG.

In a letter dated December 12, 1996, from F. J. Miraglia (NRC) to D. M. Smith (PECO Energy), the NRC requested that both volumes of the draft NUREG be reviewed and comments be provided, as appropriate. Accordingly, PECO Energy has reviewed both volumes of the NUREG and offers the attached comments for consideration by the NRC. Our comments encompass the overall conclusions and address points specific to each of our nuclear power plant facilities, i.e., Limerick Generating Station (LGS) and Peach Bottom Atomic Power Station (PBAPS). Plant-specific comments are included as Attachment 1 to this letter.

Draft NUREG-1560 is a very comprehensive compilation of the findings and results of the Individual Plant Examination (IPE) analyses, and as such, represents a wealth of information available to assess similarities and differences among plants. PECO Energy believes that draft NUREG-1560 is an appropriate document to illustrate the impact of plant-specific design and operational differences and the subsequent impact on risk.

PECO Energy supports the use of Probabilistic Safety Assessment (PSA) within the regulatory framework, and as such, believes some generic insights from draft NUREG-1560 can be used to identify and focus the application of risk-informed regulatory activities. Generic insights and comparison can be useful; however, we do not advocate the application of plant-specific "vulnerabilities" to any other plant. The uniqueness of design and operation at each plant coupled with the information supplied in the IPE submittals may not provide sufficient detail for applying results generically to other plants or vintages of plants. In many cases, the comparison of plant results can result in misleading conclusions unless investigation into the details is undertaken. This is true for PECO Energy operated plants, LGS and PBAPS, both of which are categorized as similar vintages in draft NUREG-1560 but possess key differences in design. Attachment 2 illustrates this perspective.

The development of the PECO Energy IPEs in response to Generic Letter 88-20, "Individual Plant Examination for Severe Accident Vulnerabilities - 10 CFR50.54(f)," and the subsequent use of PSA as a tool to support decision-making continue to satisfy the objectives of GL 88-20 by identifying and understanding severe accident behavior on a plant specific basis.

The issue of quality is a central theme in draft NUREG-1560. The quality of the IPEs as a whole is questioned because of the perceived variability of results due to differences in boundary conditions, plant design/operation, or assumptions. This conclusion appears to result from "backfitting" a vision of standardization among PSAs rather than reaffirming the purpose of the GL 88-20, namely, that each plant is unique and, therefore, requires a unique assessment of risk.

PECO Energy has been involved in the development and implementation of the Boiling Water Reactor Owners' Group (BWROG) "PSA Peer Review Certification Implementation Guidelines." These guidelines reflect an approach that recognizes the different "quality" grades of a PSA as a function of its application. Chapter 14 of draft NUREG-1560 defines the quality attributes of a PSA that encompass the "state of the art" rather than recognizing that a different set of quality requirements may exist depending on the application of the PSA model. We believe current PSAs can be used for specific applications and strongly support the BWROG peer review process using utility peer reviewers as a mechanism to address the issue of quality for PSA applications.

If you have any questions or require additional information, please contact Mr. Alan J. Marie, PSA Branch Manager, at (610) 640-6580.

Very truly yours,

G. A. Hunger, Jr.

G. A. Hunger
Director - Licensing

Attachments

ATTACHMENT 1

Limerick Generating Station (LGS)

NUREG-1560 Page, Section, Location	Comment
p. 2-16, Sec. 2.3.1	Table 6.2-2 of the LGS IPE submittal committed to a cross-tie between the fire water system and the Residual Heat Removal (RHR) system to provide an AC independent external injection source to the reactor vessel using the diesel driven fire pump. This plant improvement has been implemented using a 6" fire hose and not a hard pipe. A hard pipe cross-tie exists between the Residual Heat Removal Service Water (RHRSW) system and the RHR system for RPV injection from an external water source.
p. I-4 Vol. 1, I-9 Vol. 2, Index	The index is extremely useful when searching for specific plants within the report. There are, however, a few reference discrepancies that require changing. Namely, p. 3-17 should be changed to 3-16, and reference to p. 5-17 should be deleted. No discussion referencing LGS appears on pages 9-35, 9-36, 9-51, and 9-60. Discussion referencing LGS does appear on pages 9-21, 9-23, and 9-40 but is not referenced in the index.
p. 9-21, Table 9.10	Table 9.10 indicates all of the plant improvements identified by the LGS IPE were implemented as of the date of the IPE submittal. Table 6.2-2 of the LGS IPE submittal clearly indicates that only 1 of the 4 planned improvements were implemented at the time of the IPE submittal in July 1992. All of the planned improvements listed in the IPE submittal have since been implemented at both LGS units.
p. 9-23, Sec. 9.3.1.2	LGS only cited procedural enhancements to improve AC system reliability by cross-tying 4KV electrical buses. Hardware upgrades were not required to implement this improvement as stated in the text of draft NUREG-1560.
p. 9-40, Sec. 9.4.3.1	A connection between the fire water system and RHR for use in spraying the drywell did not exist as of the IPE submittal date. Section 6.2 (p. 6-1) and Table 6.2-1 of the LGS IPE submittal state that although a cross-tie exists between the RHRSW system and the RHR system, a plant improvement will be implemented to allow fire water to spray the drywell through the RHR system. This plant improvement has been subsequently implemented.
p. 10-8, Table 10.2	Although not specifically mentioned, LGS is designed with 3 automatically initiated Standby Liquid Control (SLC) pumps. Table 10.2 states that the SLC system is a two train system for all BWR vintages.
p. 10-9, Table 10.2 p. 10-13, Sec. 10.2.1.4	LGS is categorized as a BWR 4 with 4 LPCI pumps and 2 loops for injection. LGS design uses 4 LPCI trains, each with its own suction, pump, and injection nozzle into the RPV.

NUREG-1560 Page, Section, Location	Comment
p. 10-11, Sec. 10.2.1.2	The text describing the SLC systems at BWRs does not recognize the unique features of the system at LGS. As mentioned previously, the LGS SLC system contains 3 automatically initiated pumps and can be manually initiated if required. Therefore, the text "only automatically initiated" is not applicable to LGS.
p. 10-12, Sec. 10.2.1.3	The global statement that BWR vintages 3 through 6 all use 3-stage target rock Safety Relief Valves (SRVs) is incorrect. LGS uses 2-stage target rock SRVs.
p. 10-16, Sec. 10.2.1.6	LGS has 4 dedicated diesels per unit (8 for the site)
p. 11-37, Sec. 11.2.2	Online testing of interfacing valves performed during shutdown is mutually exclusive. Delete the term online.
p. 13-17, Sec. 13.3.4.1	Table 3.3.3-1 in the LGS IPE indicates the highest value human failure to depressurize is associated with depressurization to allow condensate injection and is conditional on the failure of high pressure injection systems. The second highest human failure probability is conditional upon the failure of the Automatic Depressurization System (ADS) system. The draft NUREG does not accurately reflect the information in the Limerick submittal.

Peach Bottom Atomic Power Station (PBAPS)

NUREG-1560 Page, Section, Location	Comment
p. I-12 Vol. 1, I-5 Vol. 2, Index	The index is extremely useful when searching for specific plants within the report. There are, however, a few reference discrepancies that require changing. Namely, p. 3-17 should be changed to 3-16, and reference to p. 6-2, 9-9, 9-27, 9-33, 9-35, 9-52 should be deleted. Reference to p. 9-6, 9-18, 9-21, 9-23, 9-34, and 16-7 should be added for PBAPS.
p. 11-37, Table 11.9, Sec. 11.2.2.2	The relatively low Station Blackout (SBO) contribution to the total Core Damage Frequency (CDF) for PBAPS, Units 2 and 3 results from the shared diesel configuration requiring consideration of both units power requirements during a "common" Loss of Offsite Power (LOOP) initiator and the recognition that a higher probability exists for a few diesels (but not all) to be unavailable following a LOOP. This results in LOOP sequences contributing more to the CDF than SBO sequences.
p. 17-2, Table 17.1	PBAPS is a BWR-4 and not a BWR-3 as identified in the table.

ATTACHMENT 2

The uniqueness of design and operation at each plant can create a complex basis for developing generic insights or applying results to other plants or vintages of plants. In many cases, the comparison of plant results can be misleading until investigation into the bases is well understood. This is true for PECO Energy operated plants, Limerick Generating Station (LGS) and Peach Bottom Atomic Power Station (PBAPS), both of which are categorized as similar vintages in draft NUREG-1560 but possess key differences in design. Below are examples where key differences in design and operation provide differences in Human Error Probability (HEP).

Plant Attribute	Parameter/Calculation Impacted	PBAPS	LGS	Result
Standby Liquid Control System (SLCS)	Operator response to ATWS Sequences	2, manually initiated pumps	3, automatically initiated pumps	The operator action associated with initiation of the SLCS system is very different for each plant. The operator failure for initiating SLCS at PBAPS (ranges between [1 in 4] to [1 in 500] depending on conditions and system status) is based on the cognitive recognition of plant parameters identified in the EOPs and the action(s) needed to start the SLCS pumps. The operator failure for LGS (1 in 10) is conditional on the failure of the system to automatically start. This is partially recognized as the reason for the high failure rate in NUREG-1560, p. 13-18. The basic event descriptions are similar but represent different situations, and therefore different failure rates.

ATTACHMENT 2

Plant Attribute	Parameter/Calculation Impacted	PBAPS	LGS	Result
Low Pressure Coolant Injection System (LPCI)	Low Pressure Injection Failure Probability	4, automatically initiated pumps injecting through 2 recirculation loops into the reactor vessel.	4, automatically initiated pumps injecting through 4 separate reactor vessel nozzles.	The number of failures and, therefore, the probability of failing the LPCI system are different for each plant due to the subtle injection point design difference. At Peach Bottom, a few failures, specifically the loop injection valves, can prevent all 4 pumps from injecting. However, injection through a recirculation loop can be provided with opposite loop's pumps using a cross-tie that exists within the RHR system. Therefore, some hardware failures can be mitigated through operator action through cross-tying. At Limerick, additional independent or common cause failures need to occur to prevent LPCI injection into the vessel due to the separate injection flowpaths. The cross-tie capability between opposite divisional (i.e. A pump through B injection nozzle) LPCI trains does not exist at Limerick. The probability of LPCI failing to provide injection differs by an order of magnitude due in part to the design differences. This insight cannot be readily identified from the IPE submittal information.