From: Neff, David B:(GenCo-Nuc)
To: Ennis, Rick
Cc: Helker, David P:(GenCo-Nuc)
Subject: [External_Sender] PB MUR Draft Safety Evaluation Comments
Date: Monday, November 13, 2017 2:48:58 PM
Attachments: PB MUR SER Draft Comments for NRC FINAL 111317.pdf

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As requested in your letter dated 10/30/17 (ML17289A324), attached are Exelon's comments on the Draft Safety Evaluation for the PBAPS MUR Uprate Amendment. The is no proprietary information contained in this response. The vendors who submitted proprietary information contained in the original LAR have concluded that no additional information in the draft SE needs to be marked as proprietary. Comment 12 corrects the proprietary makers in Section 3.3.2 by reducing the text to be withheld. Comment 14 identifies a need to correct information contained within the proprietary markers in the table in Section 3.3.3 based on Attachment 10 of the original LAR. There were no significant errors identified which would require additional technical review.

Please let me know if you have additional questions.

Thank you,
Dave

PEACH BOTTOM MUR NRC DRAFT SAFETY EVALUATION COMMENTS
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Item #	SE Section	Comment	Suggested Comment Resolution
1	1.1/p3	First sentence of last paragraph of this section should be revised to state: "…a differential pressure for a venturi is proportional to **the square of** the FW velocity in the pipe.	Technical Clarification.
2	1.2/p3	Second sentence of first paragraph should be revised to state that the LEFM system was installed in U2 in 2002.	Factually Incorrect. See LAR Attachment 1 Section 1.0 p2
3	2.1.2/p13	Third paragraph, second sentence should be "**burnable poison**" vice "bundle poison"	Editorial
4	3.1/p10	Bullet for TSAR Section 11.0 incorrectly includes 'TSAR Section 12.0'	Editorial. Delete "TSAR Section 12.0" from last bullet.
5	3.2.4/p17	5th paragraph: The paragraph should be clarified since the term "SLMCPR protection confirmation," is not used in the TSAR.	Technical Clarification. See TSAR 2.4.1 Suggested wording: "The plant-specific application demonstrates that the analyses and evaluations supporting DSS-CD are applicable to the fuel loaded in the core and the new operating power domain. ~~TPO may also affect the SLMCPR protection confirmation slightly. The SLMCPR protection calculation is dependent upon the core and fuel design~~ **and The DSS-CD confirmation checklist based on the demonstrated applicability extension for TPO is used to demonstrate applicability** ~~performed~~ for each reload. ~~These features will be analyzed for the first reload analysis that incorporates the new rated power level.~~
6	3.3.1/p20	1st paragraph, 2nd sentence states: "As discussed in TSAR Section 3.1, the licensee stated that the steam flow associated with the TPO uprate can be regulated adequately by adjusting the turbine control valve (TCV) position;…" This discussion is not explicitly discussed in Section 3.1 of the TSAR. A more appropriate reference is TSAR Section 5.2.1.	Editorial. Suggest revise sentence as follow: "As discussed in TSAR Section **5.2.1**, the licensee stated that the steam flow associated with the TPO uprate can be regulated adequately by adjusting the turbine control valve (TCV) position;…"

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7	3.3.1/, p.20	First sentence of 2nd paragraph states: "Evaluations and analyses for PBAPS *were performed (emphasis added)* at 102 percent of CLTP to demonstrate that the reactor vessel conformed to ASME and plant TS requirements." Current ASME analysis, however, is performed at 100% CLTP with 2% power uncertainty consideration. TSAR therefore states that … the current ASME overpressure analysis *accounts for ≥102% of CLTP*. Suggest revise sentence as follows: "Evaluations and analyses for PBAPS **account for** 102 percent of CLTP … and plant TS requirements."	Technical Clarification. See TSAR 3.1 p3-1 4th bullet
8	3.3.2/p27	In the 2nd paragraph on the page, the 1st sentence states: "The current licensing basis 32 EFPY and 54 EFPY P-T limits for PBAPS, Units 2 and 3, were calculated based on the licensee's plant-specific application of the methodology documented in Topical Report NEDO-33178-A." The 32 EFPY is not current licensing basis. The data (from BWRVIP05) for 32 EFPY in TSAR Tables 3-4a and 3-4b are provided as bounding value goals for the 54 EFPY plant-specific evaluation.	Factually Incorrect. See TSAR 3.2.1 (c) and Tables 3-4a and 3-4b Recommend re-writing the sentence as: "The current licensing basis 54 EFPY P-T limits for PBAPS, Units 2 and 3 were calculated based on the licensee's plant-specific application of the methodology documented in Topical Report NEDO-33178-A."
9	3.3.2/p28	Second to last line should be revised as follows: "including locations where **they** intersect"	Editorial
10	3.3.2/p30	In the subsection "RPV Structural Evaluation," the 1st paragraph, last sentence states, in part: "…the shroud support attachment to the RPV component is within the allowable limits for acoustic loads and is, therefore, structurally qualified…" Suggest this phrase be clarified as follows: "…the shroud support attachment to the RPV component is within the allowable **stress and fatigue** limits, **including** acoustic loads, and is therefore structurally qualified…"	Technical Clarification. See TSAR Section 3.2.2.3 and Table 3-5
11	3.3.2/p30	In the subsection "RPV Structural Evaluation," 2nd paragraph, 3rd line, change "1,02" to "1.02" (i.e., change comma to point).	Editorial.

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12	3.3.2/p30	In the subsection "RPV Structural Evaluation," 2nd paragraph, 2nd sentence: the phrase "…the proposed TPO power level of 4016 MWt" is not marked as GEH proprietary information in the TSAR. TSAR Section 3.2.2 states outside of propriery markings: "…the actual TPO operating power level of 4,016 MWt." Note that this comment is written in such a way as to avoid stating proprietary information.	Proprietary Marking Correction. The proprietary marking can end before "the proposed", such that the phrase "the proposed TPO power level of 4016 MWt" is public.
13	3.3.3/p31	The last sentence of the 1st paragraph under Steam Separator and Dryer Performance states that a moisture content of 0.10 weight percent is the current licensing basis at TPO conditions. As discussed in the MELLLA+ Safety Evaluation Report (Reference 6 Attachment 1 of the MUR LAR), Section 3.2.8, 0.10 weight percent is actually the "design basis value" while 0.30 weight percent is the "licensing basis value" used for the bounding analysis for EPU which bounds MELLLA+ and MUR conditions. Suggest revising sentence as follows: "The results of the evaluation demonstrated that the steam separator/dryer performance will be acceptable because the moisture content will remain less than or equal to the **design** basis value of 0.10 weight percent at TPO conditions."	Technical Clarification. See MELLLA+ Safety Evaluation p51 1st paragraph.
14	3.3.3./p32	U3 Dryer component labels do not agree with label in LAR Attachment 10 Table 3-2 on page 19	Factually Incorrect. Proprietary Information Correction WEC Proprietary information
15	3.3.4./p32	2nd paragraph in section states: "The vibration levels for the TPO conditions were estimated from measured vibration data during startup tests on the prototype plant, Browns Ferry Nuclear Plant, Unit 1." The GEH TSAR says: "…NRC designated prototype plant, Browns Ferry….."	Editorial. Add "<u>NRC designated</u>" to the sentence: "The vibration levels for the TPO conditions were estimated from measured vibration data during startup tests on the **NRC designated** prototype plant, Browns Ferry Unit 1."
16	3.3.4/p33	In the 2nd full paragraph on the page, 2nd sentence, change "RPV top head nozzle" to "RPV top head nozzle**s**" (i.e., there is more than one nozzle).	Editorial

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17	3.3.4/p33	In the 2nd to last paragraph, last sentence, consider adding "based on ASME Appendix N criteria" after "analytical evaluations". Suggest revise as follows: "The licensee stated that analytical evaluations **based on ASME Appendix N criteria** have shown that the safety-related piping components and thermowells in the MS, FW, and RRS piping are structurally adequate for TPO conditions."	Editorial
18	3.3.5/35	*Erosion/Corrosion* second paragraph states: *The licensee stated that the CHECWORKS™ SFA 3.0 model is used to calculate potential wall thinning of components susceptible to FAC*. Suggest revise as follows as per TSAR 3.5.1 Erosion/Corrosion p3-12: "The licensee stated that the CHECWORKSTM SFA 3.0 **predictive modeling program** is used to calculate potential wall thinning of components susceptible to FAC."	Editorial .
19	3.3.5/p36	Third to last paragraph first sentence should be revised as follows: MELLA+ should be MELLLA+	Editorial
20	3.4.2/p44	Last line of second paragraph in 3.4.2 should be revised as follows: "Each of these systems is describe**d** below"	Editorial
21	3.4.2/ p 48	SE Section 3.4.2 *TSAR Section 4.2.5.1*, top of p48, states that ECCS pumps suction strainer debris loading occurs during LOCAs and not during special events. However, the ATWS special events and the small steam line break also include ECCS suction strainer loading in NPSH calculations. Suggest revise first sentence as follows: "The ECCS pumps suction strainer debris loading **occurs during LOCAs, the small steam line break, and during the ATWS special event**."	Factually Incorrect. See TSAR 4.2.5.1

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22	3.4.3/ p. 48	SE states in second paragraph, 1st sentence: "The PBAPS LOCA analyses resulted in a licensing basis peak cladding temperature (PCT) of less than 1925 °F for GNF2 fuel…". This was the EPU PCT (see EPU LAR Table 2.8-6). The M+ PCT is 1920 °F. Suggest revise as follows: "The PBAPS LOCA analyses resulted in a licensing basis peak cladding temperature (PCT) of less than **1920** °F for GNF2 fuel…".	Factually Incorrect. See MUR LAR Supplement 5 Reload 21 Revision 0 Table 16.1-1
23	3.4.6/p49	First line of section 3.4.6, should reference TSAR Section **4.6** not 3.4.6.	Editorial
24	3.5.2/p52	Suggest clarifying the wording in second sentence of *TSAR Section 5.2.1 – Pressure Control System* regarding the use of the TBVs in pressure control.	Technical Clarification. Suggest using the information from the UFSAR 11.1 description of the TBVs and revise 2nd sentence as follows:: "The PCS controls reactor pressure by modulating turbine control valve position and through use of the turbine bypass system when **discharge of excess steam directly to the condenser is required**."
25	3.5.4/p53	Sixth paragraph, last sentence, replace "The Cameron LEFM system has..." with "The Cameron LEFM **flow meters have** two operating modes (Normal and Maintenance) and a Fail mode as follows:"	Technical Clarification. The modes of Normal (CheckPlus), Maintenance and Fail are applied to the flow meters. See LAR Attachment 1 Section 3.3.4, p9, 2nd paragraph or Attachment 8 Section 2.0.
26	3.5.4/p54	Suggest revising the last sentence of first bulleted item as follows: "Per the LAR, the plant will be able to operate at up to 4016 MWt when **all three LEFM flow meters are** in CheckPlus mode."	Technical Clarification. The modes of Normal (CheckPlus), Maintenance and Fail are applied to the flow meters. See LAR Attachment 1 Section 3.3.4, p9, 2nd paragraph or Attachment 8 Section 2.0.
27	3.5.4/p54	Suggest revising the last sentence of second bulleted item as follows: "In the event of a failure of one path or plane **in any, or all, of the three LEFM flow meters** that cannot be restored to full functionality within 72 hours, power will be reduced to ≤ 4,010 MWt."	Technical Clarification. The modes of Normal (CheckPlus), Maintenance and Fail are applied to the flow meters. See LAR Attachment 1 Section 3.3.4, p9, 2nd paragraph or Attachment 8 Section 2.0
28	3.5.4/p54	Suggest revising the last sentence of third bulleted item as follows: **"If any of the three LEFM flow meters are in the Fail Mode**, the power level uncertainty reverts to the 2.0 percent associated with the venturi flow meters and power will be reduced to ≤ 3,951 MWt within 72 hours if LEFM functionality cannot be restored."	Technical Clarification. The modes of Normal (CheckPlus), Maintenance and Fail are applied to the flow meters. See LAR Attachment 1 Section 3.3.4, p9, 2nd paragraph or Attachment 8 Section 2.0.

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29	3.5.4/p54	Suggest revising the second sentence of the paragraph under bulleted items as follows: "These diagnostics can identify failure conditions that will cause the LEFM **flow meters** to switch from the CheckPlus mode to the Check (Maintenance) or Fail modes.	Technical Clarification. The modes of Normal (CheckPlus), Maintenance and Fail are applied to the flow meters. See LAR Attachment 1 Section 3.3.4, p9, 2nd paragraph or Attachment 8 Section 2.0.
30	3.5.4/p54	Suggest revising the fourth sentence of the paragraph under bulleted items as follows: The PMS provides a visual alarm upon change **in the status of an LEFM flow meter** on the operator overview visual display screen."	Technical Clarification. The modes of Normal (CheckPlus), Maintenance and Fail are applied to the flow meters. See LAR Attachment 1 Section 3.3.4, p9, 2nd paragraph or Attachment 8 Section 2.0.
31	3.5.4/p55	First paragraph under LEFM Inoperability (p55), last sentence, the "<" in front of 3951 MWt should be a "**≤**".	Factually Incorrect. 3951 is the CLTP, see LAR Attachment 1 Section 1.0; also see SE p54 3rd bullet (Fail Mode)
32	3.5.4/p55	In the table under LEFM Inoperability recommend changing the first heading by inserting "**Flow Meter**" between "LEFM" and "Operating"	Technical Clarification. The modes of Normal (CheckPlus), Maintenance and Fail are applied to the flow meters. See LAR Attachment 1 Section 3.3.4, p9, 2nd paragraph or Attachment 8 Section 2.0. Also see LAR Attachment 1 table on p12.
33	3.5.4/p55	In the table under LEFM Inoperability, recommend replacing "(Normal)" with "(**All in Normal**)" under "CheckPlus".	Technical Clarification. See LAR Attachment 1 table on p12
34	3.5.4/p55	In the table under LEFM Inoperability, recommend replacing "Maintenance)" with "(**One or More in Maintenance and None in Fail**)"	Technical Clarification. See LAR Attachment 1 table on p12
35	3.5.4/p55	In the table under *LEFM Inoperability*, recommend inserting "[**Any**]" under "Fail"	Technical Clarification. See LAR Attachment 1 Section 3.3.4 *LEFM Inoperability*, last two sentences of third paragraph.
36	3.5.4/p56	In sentence under Criterion 1 Conclusion, add "concludes" after "NRC staff"	Editorial
37	3.5.4/p.58	The explanation in the SE on p.58 for the remaining .02% difference between the 2002 LEFM uncertainty and the 2017 uncertainty is not complete.	Technical Clarification. The SE should also state that the largest contributor to the remaining 0.02% difference arises from a correction made to the application of a steam table enthalpy correlation uncertainty term as described in the response to EICB-RAI-1 in Supplement 2.
38	3.6.1/p62	Second paragraph, third sentence. Suggest deleting "only"	Editorial

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39	3.6.1/62	Third paragraph, fourth sentence, states: "...load values at maximum rated generator output are bounded by the projected load values at TPO..." The clauses are reversed. It should state: "...load values at maximum rated generator output bound the projected load values at TPO..."	Factually Incorrect. See TSAR 6.1.1 p6-1, last bullet and Supplement 2 Response to EEOB-RAI-2.
40	3.6.4/ p 65	SE Section 3.6.4, 2nd paragraph states that PBAPS has a safety-related emergency heat sink facility. The Emergency Heat Sink, however, is actually classified as a "special safety system" (UFSAR 1.6.3.3) and seismic Class I structure (UFSAR 10.24.3).	Technical Clarification. UFSAR Sections 1.6.3.3 and 10.24.3 Suggest revising sentence as follows: "The normal heat sink for PBAPS is the Conowingo Pond. **When the Conowingo Pond is not available, cooling water to the ESW and HPSW systems is provided from an emergency sink which is a special safety system and a seismic Class I structure.**
41	3.9.2/p72	In fourth paragraph, "UFSAR Table 14.9-7" should be "UFSAR Table 14.9**.**7" (i.e. dash should be a point)	Editorial
42	3.9.3/ p77	SE 3.9.3 2nd paragraph on p77 states "…the licensee stated in supplement dated August 8, 2017, that limiting ATWS events for peak vessel bottom pressure, ATWS PCT, and ATWSI PCT, are all performed at the same statepoint corresponding to point J for MELLLA+ and point J for TPO on TSAR Figure 1-1a, "Power/Flow Map for TPO."" The MELLLA+ point is J' (i.e. J prime). Suggest revising as follows: "…are all performed at the same statepoint corresponding to point **J'** for MELLLA+ and point J for TPO on TSAR Figure 1-1a, "Power/Flow Map for TPO."	Editorial. TSAR Figure 1-1a
43	3.10.5/p86	First paragraph under Operator Actions, last sentence – "that that" should be "than that".	Editorial
44	END		