Progress Energy Carolinas, Inc (PEC) Comments on TIA 2003-05 NRC Policy Questions on Technical Specification Adequacy and Related Technical Specification Operability At Brunswick Nuclear Plant		
Comment Number	**TIA Statement & Location**	**PEC Comment**
1	Page 1, Paragraph 1 first sentence. ...the inspection team identified a finding and unresolved item (URI) related to the **adequacy of the Technical Specification** (TS) Table 3.3.5.1-1 allowable value for the Condensate Storage Tank (CST) Level - Low function.	This is contrary the finding in inspection report 05000325/2003008 and 05000324/2003008 which states: ...The team identified **a violation of 10 CFR 50, Appendix B, Criterion III, Design Control requirements.** The Technical Specification (TS) allowable value for the Condensate Storage Tank (CST) Level - Low function, for automatic high pressure coolant injection (HPCI) pump suction transfer to the suppression pool, was not adequately supported by design calculations. The calculations did not adequately address the potential for air entrainment in the HPCI process flow due to vortexing. This finding is in the licensee's corrective action program as Action Request 102456. This finding is unresolved pending further NRC review of the requirements for the CST Level - Low function and of the corrective actions related to restoration of compliance with **10 CFR 50, Appendix B, Criterion III, Design Control requirements.**
2	Page 1, Paragraph 1, last sentence. The calculation included both analysis and measurement errors.	This statement would be more correct if stated in terms of "analysis and dimensional errors". The dimensional errors included not accounting for constructions tolerances and overlooking the need to include the tank baseplate thickness. No erroneous "measurement" values were used in the calculation.
3	Page 1, Paragraph 2, next to last sentence. The licensee's analysis was based on informal testing by a licensee engineer using a scale model made and operated by the engineer	This statement is not entirely accurate. The original analysis was based, in part on the informal testing, but the test method was later identified to be inadequate during a self assessment. The analysis was then updated based on the best available information at the time. In early 2001, the utility performed another review of the issue. Although another search of industry papers found none that provided an equation applicable to the BNP geometry, a valid engineering paper was found that provided a qualitative description of the phenomena. This paper indicated that the results of the informal testing were not unreasonable. This was combined

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		with an assessment of the conditions that require switch actuation to conclude that the setpoint was adequate based on best available engineering information
4	Page 2, Paragraph 2, first sentence. The NRC inspection team identified ... reliance on informal/inappropriate tests and research papers,	The research papers referenced as being "inappropriate" for use were the best representation of the physical conditions of the CST at the time that the calculation was being developed.
5	Page 3, Entire paragraph starting "Licensee's Position" Licensee's Position: **The licensee's position was that there were no licensing/design basis events that would result in a low CST level that would challenge the CST Level - Low function.** They stated that the HPCI pump would not be running at its automatic flow rate of 4300 gpm with a low CST level because; 1) The TS-required Suppression Chamber Water Level – High function would activate first and would automatically transfer the HPCI pump suction from the CST to the suppression pool or 2) Operators could manually operate the HPCI pump with a low CST level, but would then manually stop the pump in response to a high reactor vessel water level and before any entrained air would reach the pump. **Consequently, the licensee's operability determination stated: The Low CST level setpoint does not need to provide any protection for LOCA events.** It does provide protection when either an operator action in accordance with existing procedures, suppression Pool level reduction is considered, or when early MSIV closure is not assumed." The licensee considered that the existing TS allowable value for the CST Level - Low function was adequate and did not need to be changed. The licensee planned to leave the TS allowable value unchanged.	• AR 106230-10 page 6 and page 7 state that the "Backup to RCIC Function" is a Design and Licensing basis requirement for HPCI. On page 9 in the "Overall Conclusions" section, AR 106230-10 stated: "The Tech Spec instrument function is however required for HPCI when it is providing the backup to RCIC function. This function can require extended HPCI operation, either at a reduced flow rate or intermittently. The potential for an acceptable operator action in accordance with existing procedures (reducing suppression pool level) could result in pump damage if the setpoint is not adequate. Additionally, if early MSIV closure does not occur, a loss of feedwater event may result in CST depletion. For this backup to RCIC function, operator actions for manually controlling vessel level late in the event are appropriate. Either the HPCI flow rate would be reduced acceptably or HPCI would be operated at full flow for only 60 seconds. For the full flow case, no air would reach the pump during the last injection with CST suction and the HPCI suction swap would then be completed prior to the next HPCI injection. This provides the protection that is needed to prevent continued HPCI operation with the suction lined up to a depleted CST." • Lack of reliance on HPCI for a LOCA is based on the following, as stated in AR 106230-10 Operability

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		Evaluation: On March 29 1989, CP&L submitted an evaluation to the NRC for revised LOCA licensing basis and to update the demonstration of conformance to the criteria provided in 10CFR50.46, as modified by SECY-83-472, Emergency Core Coolant System Analysis Methods. This evaluation, Brunswick Steam Electric Plant, Units 1 & 2, SAFER/GESTR-LOCA Loss-of-Coolant Accident Analysis, NEDC31624P, assumed less performance from ECCS systems to allow for relaxation of some selected requirements; **specifically, 0 gpm HPCI flow.** On June 1, 1989, the NRC issued a Safety Evaluation for the CP&L submittal. This SER included "Lastly the staff notes that significant system or component assumptions included no offsite power, **no high pressure coolant injection system**, two SRV/ADS valves out of service and a SRV setpoint tolerance of 3%. The assumptions are acceptable." It also provided the following "On this basis, the analysis contained in the GE report can be used to provide a revised LOCA licensing basis for both Brunswick units, and can be referenced in future submittals."
6	Page 3, bottom of page, page 4, top of page. Based on this, the Region II position is that the CST Level - Low suction transfer function needs to ensure that its design basis requirements will be met **regardless of the circumstances** that call it into use.	HPCI can produce 6000 to 8000 gpm with vessel pressure in the 800 to 1000 psig range applicable to most expected HPCI injections. If a "regardless of circumstances that call it into use" approach was taken, it would require that these flow rates be considered even though they are above the published design flow and no "accident evaluation" relies upon them. A "regardless of circumstances that call it into use" requirement for individual components is well beyond standard design practices.

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7	Page 4 top two paragraphs. CST Level - Low suction transfer function needs to ensure that its design basis requirements will be met regardless of the circumstances that call it into use. The design criteria does not appear to be dependent on any analysis of the sequence of licensing or design basis events. The Region II staff did not attempt to review the sequence of all licensing/design basis events to check the licensee's contention that none would challenge the CST Level - LOW function with the HPCI pump operating in automatic at 4300 gpm. However, an important point to note is that the CST is considered non-safety; and as such is not designed to withstand high winds, missiles, or seismic events. Additionally, the non-safety CST is not subject to the same quality of design, construction, and testing as safety-related equipment. The fact that the CST is considered non-safety may have been a significant factor related to the TS operability requirement for the CST Level - Low function for automatic transfer of the HPCI pump suction.	These statements are not based in fact and contain assumptions that have not been validated; • **"transfer function needs to ensure that its design basis requirements will be met regardless of the circumstances that call it into use."** o No guidance can be found to support this position. In fact, all guidance on operability requirements state the opposite. • **The design criteria does not appear to be dependent on any analysis of the sequence of licensing or design basis events.** o This statement has not been validated and is opinion only • **However, an important point to note is that the CST is considered non-safety; and as such is not designed to withstand high winds, missiles, or seismic events. Additionally, the non-safety CST is not subject to the same quality of design, construction, and testing as safety-related equipment.** o Accidents and transient analysis is independent of seismic and external events. There is no requirement to review together. • **The fact that the CST is considered non-safety may have been a significant factor related to the TS operability requirement for the CST Level - Low function for automatic transfer of the HPCI pump suction.** o This statement has not been validated and is opinion only.

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8	Page 4, Question 3 May the licensee use 10 CFR 50.59 to add an operator action (without NRC approval) to assist the CST Level -Low function in protecting the HPCI pump from air entrainment (e.g., an operator action to manually reduce the HPCI flowrate if the CST water level becomes too low)?	This condition is no different than any other long term accident response where we rely on operator action (e.g., ECCS NPSH control post 10 min./long term containment cooling, as discussed in Section 6.2.1.1.3.2 of the BSEP UFSAR). Manual action with ECCS is allowed and assumed for long term cooling events. UFSAR, section 6.3.2.8 states, "The ECCS have been designed to start automatically in the event of an accident that threatens the adequacy of core cooling. Manual operations are required to maintain long term cooling." No operator action is assumed for the first 10 minutes of an event. CST depletion/HPCI throttling would be expected to occur approximately 4 hours into an event. Additionally, the proposed procedure change is not a new operator action, but merely clarification of existing actions in procedure 1/2OP-19, "High Pressure Coolant Injection System Operating Procedure." OP-19 contains a step in both the automatic actuation and manual actuation sections which requires operators to "adjust turbine speed and system flow, using HPCI FLOW CONTROL, as needed for reactor vessel level control." Since operator actions would take place well into the event and these actions are already proceduralized, this does not represent a new manual action or crediting of a manual action as discussed in Information Notice 97-78, "Crediting of Operator Actions in Place of Automatic Actions and Modifications of Operator Actions, Including Response Times." In addition, UFSAR section 6.3.2.8 states the following, "The operator can manually initiate the HPCI and RCIC systems from the Control Room before the Level 2 automatic initiation level is reached. The operator has the option of manual control or automatic initiation and can maintain reactor water level by throttling system flow rates."