September 14, 2008

Mr. Robert E. Brown
Senior Vice President, Regulatory Affairs
GE Hitachi Nuclear Energy
3901 Castle Hayne Road MC A-50
Wilmington, NC 28401

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 257 RELATED TO ESBWR DESIGN CERTIFICATION APPLICATION

Dear Mr. Brown:

By letter dated August 24, 2005, GE-Hitachi Nuclear Energy (GEH) submitted an application for final design approval and standard design certification of the economic simplified boiling water reactor (ESBWR) standard plant design pursuant to 10 CFR Part 52. The Nuclear Regulatory Commission (NRC) staff is performing a detailed review of this application to enable the staff to reach a conclusion on the safety of the proposed design.

The NRC staff has identified that additional information is needed to continue portions of the review. The staff's request for additional information (RAI) is contained in the enclosure to this letter.

If you have any questions or comments concerning this matter, you may contact me at 301-415-6256 or Dennis.Galvin@nrc.gov or you may contact Amy Cubbage at 301-415-2875 or Amy.Cubbage@nrc.gov.

Sincerely,

/RA/

Dennis Galvin, Project Manager
ESBWR/ABWR Projects Branch 1
Division of New Reactor Licensing
Office of New Reactors

Docket No. 52-010

Enclosure:
Request for Additional Information

cc: See next page

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Distribution: See next page

ACCESSION NO.: ML082560501 NRO-002

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DATE	09/12/2008	09/14/2008

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SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 257 RELATED TO ESBWR DESIGN CERTIFICATION APPLICATION DATED SEPTEMBER 14, 2008

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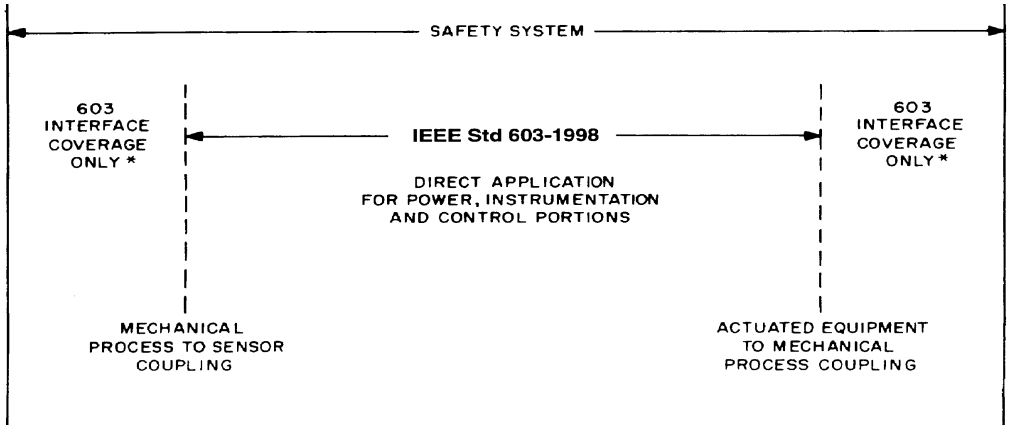
Requests for Additional Information (RAIs):
ESBWR Design Control Document (DCD) Revision 5

RAI Number	Reviewer	Question Summary	Full Text
7.1-109	Taneja D	Address “mechanical process to sensor coupling” and “actuated equipment to mechanical process coupling” in DCD Tier 2 Section 7 and Tier 1 Section 2.2	The scope section of IEEE Std 603 states, “The criteria contained in this standard establish minimum functional and design requirements for the power, instrumentation, and control portions of safety systems for nuclear power generating stations. To satisfy the criteria in this standard, interface requirements may be imposed on the other portions of the safety system as shown in Figure 1.  DCD Tier 1 or Tier 2 do not fully address the scope of IEEE Std 603 since they do not provide any discussion on mechanical process to sensor coupling, or actuated equipment to mechanical process coupling. The DCD is primarily focused on instrumentation and provides limited information on sensing and actuation lines. For example, conformance to RG 1.151, “Instrument Sensing Lines” is stated in Tier 2 Section 7.1.6.4, however no discussion is provided on separation, independence, single failure, etc. for sensing lines associated with reactor protection system (RPS), engineered safety feature system (ESF) instruments. This type of discussion should be provided under the

RAI Number	Reviewer	Question Summary	Full Text
			"Instrumentation and Control Requirements" subsections, such as, 7.2.1.5, 7.3.3.5, etc.
7.1-110	Taneja D	Q-DCIS Platforms	Tier 2 Section 7.1.2 states that the Q-DCIS uses three diverse platforms, namely: 1. Reactor Tip and Isolation Function (RTIF) function – NUMAC 2. Safety System Logic and Control/Engineered Safety Features (SSLC/ESF) function – TRICON 3. Anticipated Transient without Scram/Standby Liquid Control (ATWS/SLC) and Vacuum Breaker Isolation Function (VBIF) functions – independent logic controllers There are a number of contradicting statements in Tier 1 and Tier 2 related to Q-DCIS platforms that require clarification. Some of the examples are: ▪ DCD Tier 1 Table 2.15.1-1c, note 1 states that safety-related controls for VBIF are provided by control system independent of Q-DCIS [safety-related distributed control and information systems] and DPS [diverse protection system]. This statement can be interpreted to state that the independent logic controllers are not a part of the Q-DCIS, which is inconsistent with DCD Tier 2 Section 7.1.2. ▪ Figure 7.1.2 and Section 7.1.2 indicate that ATWS/SLC and VBIF functions are being performed by the same platform. DCD Tier 2 Section 7.3.6.2 identifies that the VBIF automatic actuation logic is performed by a control system with components similar to those used in the ATWS/SLC control system. DCD Tier 2 Section 7.3.6.2 also identifies that each VB isolation function ATWS/SLC division can be placed into manual bypass status that is automatically indicated in the MCR. Clarify whether and how the ATWS/SLC and VBIF function are being implemented on a single platform. Identify any affects of combining the

RAI Number	Reviewer	Question Summary	Full Text
			ATWS and containment cooling functions on the same platform on the topical report NEDO-33251, "ESBWR I&C Diversity and Defense-in-Depth Report," analyses. ▪ Per ATWS rule, the ATWS/SLC function is not required to be performed by safety grade components. For ESBWR, it appears that ATWS/SLC functions are being classified as safety-related. If such is the case then independent logic controllers must also comply with same regulations applicable to RTIF and SSLC/ESF platforms. For example, conformance to IEEE 603 for the ATWS function is not included in DCD Tier 2 Section 7.8.3.1.
7.1-111	Beacom, R	Commitment to remove reference to TRICON and NUMAC topical reports	In MFN 08-129, dated February 15, 2008, GEH committed to remove the TRICON licensing topical report (LTR), NEDO-33388 "ESBWR I&C TRICON (SSLC/ESF) Platform Application," Revision 0, September 2007 and the NUMAC LTR, NEDO-33288, "Application of Nuclear Measurement Analysis and Control (NUMAC) for the ESBWR Reactor Trip System," Revision 0, March 2007, from the design certification scope. This was to be completed in Revision 5 but was not done.
7.1-112	Beacom, R	Deviations to Triconex Topical Report and analysis	DCD Tier 2 Section 7.3.5.2 identifies that the SSLC/ESF architecture is presented in ESBWR DCD Tier 2 Reference 7.3-1, Triconex Topical Report 7286-545-1-a, "Qualification Summary Report." However, no additional discussion of the applicability of this report to the ESBWR design is provided. The applicant is requested to provide the deviations to the life cycle processes, hardware and software of the ESBWR SSLC/ ESF platform from that which was originally approved by the staff in the Triconex Topical Report safety evaluation report (SER). Importantly, these proposed deviations should be evaluated in an analysis against appropriate regulatory criteria identifying why the deviations are acceptable. In lieu of identifying and evaluating deviations in the design certification, a commitment in the form of a specific DAC/ITAAC would be acceptable. Also, DAC/ITAAC should be provided for verifying the implementation of the plant specific requirements identified in section 5.2 of Triconex Topical Report SER.

RAI Number	Reviewer	Question Summary	Full Text
7.1-113	Beacom, R	Reference to any previous NUMAC SE and analysis	As noted in RAI 7.1-111, the NUMAC LTR will not be used to define the NUMAC used in the ESBWR application. However, several DCD Tier 2 Sections continue to refer to the NUMAC platform. DCD Tier 2 should clarify that the NUMAC platform being proposed for the RTIF functions has not been previously submitted for review by the staff and should therefore be considered by the staff as a new platform. (Note that an entirely new platform dictates that an entire set of licensing documents should be submitted to the staff for review and approval to support a safety evaluation of the platform. Use of an existing platform allows safety analysis of the differences in addition to addressing any application specific items. The staff refers to the NRC DI&C TWG #6 for guidelines as what is to be submitted for new vs NRC staff approved digital I&C platforms.) No reference has been made to any of the previously NRC approved topical reports for a “NUMAC” platform. Importantly, no deviations, with the resulting “gap” analysis, or a commitment to do so, identifying the impact to the original safety evaluation of any NUMAC platform done by the NRC staff, have been submitted. When or if a reference is made, the utility or “plant specific” actions must also be addressed as identified in the last NUMAC SER.
7.1-114	Beacom, R	How does Section 7.1.3.4 meet the guidelines of IEEE Std. 7-4.3.2 and BTP 7-17.	DCD Tier 2 Section 7.1.3.4, Q-DCIS Testing and Inspection Requirements states that the Q-DCIS meets the self-diagnostics for digital computer based protection recommended by IEEE Std. 7-4.3.2 but does not address all characteristics. For example, but not limited to, IEEE Std. 7-4.3.2 states “The reliability requirements of the safety system shall be used to establish the need for self-diagnostics.” The concern is diagnostics can adversely affect the system to perform its safety function. In many cases the diagnostic software is more complex and extensive than the safety function software itself. The standard does not address, nor advocate, the addition of diagnostics solely for the use to support surveillance testing. This should be addressed.

RAI Number	Reviewer	Question Summary	Full Text
			While DCD Tier 2 Section 7.1.6.5 identifies that the Q-DCIS design conforms to BTP HICB-17, DCD Tier 2 Section 7.1.3.4 does not mention BTP HICB-17 or discuss its applicable criteria. Address in DCD Tier 2 Section 7.1.3.4 the applicable self-diagnostics criteria identified in IEEE Std. 7-4.3.2 and BTP HICB-17.
7.1-115	Beacom, R	NUMAC watchdog timer	a) DCD Tier 2 Section 7.1.3.4 identifies NUMAC having "a" watchdog timer. Developed digital I&C platforms have watchdog timers, for example, in the Bus Controllers, CPUs and I/O modules. Clarify the watchdog timers used in NUMAC. b) The NUMAC watchdog timer discussion identifies a "channel trip and alarm" while the instrument resets. This incorrectly suggests the channel is resetting by itself. (IEEE Std. 603-1991, Criterion 5.2)
7.1-116	Beacom, R	Self diagnostics vs. cyclically monitored items	DCD Tier 2 Section 7.1.3.4 lists self-diagnostic "capabilities" then lists cyclically monitored items: a) Is this a total listing of "capabilities" and actual diagnostics will be chosen from this list? b) Does this mean all the self diagnostics will not be cyclically monitored? c) There is no identification of what self diagnostics take place during system initialization. IEEE Std 7-4.3.2 identifies that when self-diagnostics are applied, self-diagnostics during computer system startup shall be incorporated into the system design. Clarify what self diagnostics take place during system initialization.
7.1-117	Beacom, R	Equipment vs operator initiated self diagnostics	DCD Tier 2 Section 7.1.3.4 does not identify which diagnostics have equipment vs operator initiated capabilities. Please clarify.

7.1-118	Beacom, R	Description of TSM	DCD Tier 2 Section 7.1.3.4 states the technical specifications monitor (TSM) uses a hardware/ software platform different from NUMAC and TRICON. DCD Tier 2 Section 7.1.5.2.4 indicates that the TSM is part of the plant computer function (PCF). However, the TSM is not listed with the PCF on DCD Tier 2 Figure 7.1-4, ESBWR Hardware/Software (Architecture) Diversity Diagram. Identify and describe the TSM hardware and software in the DCD. Include the TSM in DCD Tier 2 Figure 7.1-4. DCD Tier 2 Section 7.1.3.4, under the heading, "Channel Check," indicates that the self-diagnostic features of NUMAC/TRICON, in conjunction with the TSM, perform the technical specification surveillances. As the TSM is non-safety-related, clarify measures to ensure that the TSM performs the technical specification surveillances properly and to detect degradation in performance or failure of the TSM.
7.1-119	Beacom, R	Frequencies, durations of individual self-diagnostics and overall channel tests	DCD Tier 2 Section 7.1.3.4 describes the periodic testing performed to support surveillance requirements of the Technical Specifications, including channel checks, functional tests, logic system functional tests or response times. However, DCD Tier 2 Section 7.1.3.4 does not identify the required durations and frequencies of the individual self-diagnostics. Also, this section does not identify the overall time it takes to complete the series of diagnostics or which diagnostics are necessary to complete a channel check, functional test, logic system functional test or response time test. Provide this information to support the values included in the technical specifications.
7.1-120	Beacom, R	Calibration of automatic test equipment	IEEE Std 7-4.3.2 identifies that when self-diagnostics are applied, periodic self-diagnostics while the computer system is operating shall be incorporated into the system design. DCD Tier 2 Section 7.1.3.4 does not identify if the capability exists to periodically test and calibrate the automatic test equipment within the cabinets. Please clarify.
7.1-121	Beacom, R	Clarify Q-DCIS logic system functional test	The discussion of "Logic System Functional Test" in this DCD Tier 2 Section 7.1.3.4 is different than that identified in the definition in Chapter 16 Section 1.1. The DCD should explain the differences.

7.1-122	Beacom, R	Failure detection	Failures detected by hardware, software, and surveillance testing should be consistent with the failure detectability assumptions of the single-failure analysis and the failure modes and effects analysis. No comparable statement was found in DCD Tier 2 Section 7.1.3.4. This should be explicitly called out in the DCD.
7.1-123	Beacom, R	Power supply diagnostics	DCD Tier 2 Section 7.1.5.4 states, "similar to the functionality of the Q-DCIS platforms described in Section 7.1.3.4, the N-DCIS controllers are equipped with on-line diagnostic capabilities for cyclically monitoring the operability of I/O signals, buses, power supplies, processors, and interprocessor communications." However, DCD Tier 2 Section 7.1.3.4 does not discuss power supply diagnostics. Please clarify.
7.1-124	Beacom, R	Explain what "similar" means for diagnostic tests in N-QCIS	DCD Tier 2 Section 7.1.5.4 states, "Similar to the tests described for Q-DCIS in Section 7.1.3.4, the N-DCIS online diagnostic features described below support the technical specification surveillance requirements." The use of the word, "similar," is vague and implies that there may be differences. Clarify in the DCD the differences or at least where the potential for differences exist between Q-DCIS and N-DCIS online diagnostic features that support the technical specification surveillance requirements.
7.1-125	Beacom, R	Safety or non-safety MCR and RSS VDUs	Clarify in DCD Tier 2 Section 7.1.4.8.4, Plant Computer Functions Description Summary, that the item "MCR and RSS VDUs [main control room and remote shutdown system video display units]" is non-safety related.
7.1-126	Beacom, R	Reference to HFE vs I&C software plans	DCD Tier 2 Section 7.1.6.6.1.4 identifies that the safety related I&C systems "conform to the quality requirements described in IEEE Std. 7-4.3.2 as described in the software plans described in LTR, "ESBWR Man-Machine Interface System and Human Factors Engineering Implementation Plan," NEDO-33217 (Reference 7.1-13)." However, most of the information on the software plans was removed from NEDO-33217 in Revision 4. This section should instead reference the software LTRs, namely NEDE-33245P and NEDE-33226P.
7.1-127	Hardin R	Mistakes in references to internal procedures in LTRs NEDO-33226 and NEDO-33245.	The staff found multiple issues in the software LTRs NEDE-33226P and NEDE-33245P where the internal procedure reference was not correct. Please correct all references in these documents. One possible solution would be to use the same reference list in both documents – as appears to be the case for the Software Conformance Review – Appendix A – contained in both LTRs.

			For example the procedure, “Reporting of Defects and Noncompliance Under 10 CFR Part 21” is referenced as 3.g on numbered page 9 of NEDE-33226P, Rev 3. However, on numbered page 22, this procedure is footnoted as 2.g. Likewise, the procedure “Deferred Design Verification,” is referenced as 2.g on numbered page 6 of NEDE-33226P, Rev 3. However, on numbered page 28, this procedure is footnoted as 2.q. “Design Review” has a similar problem. It is referenced as 2.c on numbered page 6 of NEDE-33226P, Rev 3, but footnoted as 2.e throughout the document. 2.e also refers to “Material Request.” 2.c does not appear as a footnote anywhere in the document. In NEDE-33245P, 2.e refers to “Design Review.”
7.1-128	Hardin R	Clarify the GEH documents that may be revised as described in NEDE-33226P, Section 2.3.	LTR NEDE-33226P, Section 2.3 lists several documents which are identified as subject to revision to remain current with GEH internal procedures, and do not require the NEDE-33226P to be updated when they are revised. The staff has identified several documents that are not subject to revision as described in NEDE-33226P: NEDE-33245P; NEDE-33295P, “ESBWR Cyber Security Program Plan”; and NEDO-33275, “ESBWR HFE Training Development Implementation Plan” are incorporated by reference into the DCD and subject to specific controls. IEEE 610.12-1990 and EPRI TR-106439 are not GEH documents. Clarify the GEH documents that may be revised as described in NEDE-33226P, Section 2.3.
7.1-129	Hardin R	Organizational/ Functional Independence	NEDE-33245P, Rev. 3, Figure 2, the first footnote says: “This represents the organization at the time of SMPM and SQAPM development to reflect the independence of the I&C, SPE and SQA organizations. The organization is subject to change. However, independence of these functions shall be maintained.”

			In a teleconference, GEH informed the staff that Figure 2 is already obsolete. NRC expects GEH to make NEDE-33245P Tier 2* and accordingly Figure 2 should be revised and presented at a level that will have minimal changes over time while showing the independence of software development, verification and validation, and quality assurance functions. GEH should also identify the criteria it will use to maintain appropriate independence in future organizational changes.
7.1-130	Hardin R	Software Upgrade/Maintenance /Retirement Activities	NEDE-33226P, Rev. 2 provides a discussion of the retirement phase of software but does not identify whether replacement updating/upgrading) software can be run concurrent with existing software such that there is a period of dual operation using both systems. Clarify the methods by which dual operations will take place during the retirement phase (5.13). The TR does not clearly show the process by which the installation of software on installed systems in operating plants is performed. Affected functions should be declared inoperable according to the plant's technical specifications before proceeding with installation, and appropriate return-to-service testing should be conducted before declaring the new/upgraded/replacement software operable. In general, there is an overall concern over risks during maintenance activities, especially those risks that may compromise safety. Please provide further details on how these maintenance/upgrade activities, both during the retirement phase and/or operation and maintenance phase are managed in a manner that minimizes risks to the safety systems.
7.2-68	Taneja D	RMU Designations	In DCD Tier 2 Section 7.2.1.2.4.2 a new parameter was added in Rev. 5, namely; "Feedwater Temperature Biased Simulated Thermal Power." In this paragraph references are made to the RPS remote multiplexer units (RMU). Is this device same as the RTIF RMU? In Section 7.1, RPS designations have been replaced with RTIF when discussing the RMU, and Figure 7.1-2 only shows RTIF RMU. DCD Tier 2 Section 7.2.1.2.4.1 also discusses the RTIF RMU. GEH should verify that consistent device designations are presented throughout the DCD.

7.2-69	Taneja D	Simulated Thermal Power Scram	In DCD Tier 1 Table 2.2.7-2 and in the list of initiating circuits in DCD Tier 2 Section 7.2.1.2.4.2 (page 7.2-8), two new reactor scram initiators related to the simulated thermal power (STP) were added in Rev. 5, namely: ▪ High STP (feedwater (FW) temperature biased) ▪ FW temperature exceeding allowable STP vs. FW temperature domain The associated description is provided in DCD Tier 2 Section 7.2.1.2.4.2 under the heading of Nuclear Boiler System in a paragraph titled, "Feedwater Temperature Biased Simulated Thermal Power." However, only the 2nd reactor scram initiator is described. GEH should verify and provide a concise description of these parameters consistent with Tier 1.
7.2-70	Taneja D	RPS scram initiating signals safety classification	As described in DCD Tier 2 Section 7.2.1.2.4.2, some of the RPS scram initiating signals originate from the non-safety related components, such as, turbine stop valve (TSV), turbine closure valve (TCV), turbine bypass valve (TBV), main condenser, FW pump power sources, etc. While DCD Tier 2 Section 7.2.1.2.4.2 identifies the TSV and TBV position switches as part of the RPS, it is not clear that these switches are safety-related since they are attached to non-safety-related components. The DCD should clarify the safety classification of these scram initiating sensors/circuits. The DCD should also describe any special treatment of the associated non-safety-related components so as to prevent adverse impacts on the safety-related portions of the RPS. This discussion could be provided in Section 7.2.1.5, "Instrumentation and Control Requirements." Similar discussion should be provided for the pressure transmitters identified for the TCV hydraulics and the main condenser. DCD Tier 2 Section 7.2.1.2.4.2, in the discussion under the heading, "Loss of Power Generation Bus," does not identify any associated RPS interface for the FW pump power sources. Identify the RPS component that interfaces with the power generation bus.
7.3-15	Taneja D	VBIF and ESF systems relationship	Discussion provided in Section 7.3 does not clearly define the boundaries of the ESF systems. In Rev. 5, the VBIF was added as Section 7.3.6; however, there is no leading/introductory discussion in Section 7.3 that establishes this function as a part of the ESF systems.

7.3-16	Taneja D	VBIF Design Bases	Section 7.3.6.1 does not provide the functional design bases for the VBIF. DCD Tier 2 Section 6.2.2.2.1 identifies that the DW and WW vacuum breaker must fully close after each demand to support the PCCS operation. If the vacuum breaker does not close, a backup isolation valve closes. However, no additional details are provided and this function is not discussed in DCD Tier 2 Section 7.3.6. If the VBIF function is to assure passive containment cooling, then identify the relevant the performance requirements, such as, isolation initiating logic, isolation valve reset/open logic to allow for vacuum breaker functionality, response time, power supply requirements, etc. GEH should also provide the basis for selecting an independent digital I&C platform for this application, and need for hardwired manual controls for these VB isolation valves.
7.7-9	Eagle E	Revise DCD Tier 1 Table 2.2.3-2 to address the missing "lock-up" voter function described in Tier 2 Section 7.7.3.2.1.	In ESBWR DCD Tier 2, with Revision 5 changes Section 7.7.3.2.1 states, "If an fault tolerant digital controller (FTDC) channel detects a discrepancy between the field voter output and the FTDC channel output, a "lock-up" signal is sent to a "lock-up" voter which causes the feed pump adjustable speed drive (ASD) to maintain the current pump speed and activates an alarm in the main control room (MCR)." DCD Tier 1, Revision 5, Table 2.2.3-2 has added the one-way blocking function of the high pressure FW heater bypass values and the one-way blocking of the seventh FW heater steam heating valves, but does not mention the "lock-up" voter function. Revise Tier 1 Table 2.2.3.-2 to add the "lock-up" voter function described in Section 7.7.3.2.1 to assure that this important protective function is verified in ITAAC testing.
7.7-10	Eagle E	Revise DCD Tier 2 Section 7.7.3.5.2 to address missing components of the FWCS.	DCD Revision 5 added significant information to Tier 2, Section 7.7.3 on the feedwater control system (FWCS) FW temperature control functions including the required temperature measurement signals. However, this information is not reflected in DCD Tier 2, Section 7.7.3.5.2, Equipment. Revise DCD Tier 2, Section 7.7.3.5.2 to address the missing components of the FWCS.
7.8-9	Beacom R	Ensure that DCD Tier 2 ATWS and DPS functions and initiators are included in Tier 1 and vice versa.	The staff is unable to verify that the functions and initiators identified in the DCD Tier 1 Tables 2.2.14-2 & 3 for the diverse instrumentation and control systems corresponds to DCD Tier 2 Section 7.8. RAI 14.3-433 addresses the footnote to change this table as necessary. However, if that information will be subject to change the staff's recommendation is that Tables 2.2.14-2 & 3 be moved into Tier 2 and a DAC/ ITAAC added for the information to be updated later in the design cycle.

			a. DCD Tier 2 Section 7.8 does not have table or list that corresponds to DCD Tier 1 Tables 2.2.14-2 and 3. It would be useful to create corresponding tables or lists in Tier 2 and provide a roadmap to the sections to where the functions and initiators are identified and described. b. The functions and initiators have significantly different names in Tier 1 and Tier 2 which is difficult to track. Items identified as functions in Tier 1 are alternatively identified as functions, trips or logic. c. DCD Tier 2 section 7.8.1.1.2 (5th bullet) indicates that a manual ATWS mitigation signal initiates SLC System, ARI and FWCS runback of feedwater flow. The manual ATWS initiator has been included in DCD Tier 1 Table 2.2.14-2 for ARI but not for SLC System and FWCS runback. d. The "SCRRI/SRI signal and power levels remain elevated" initiator for ARI was deleted in revision 5 from DCD Tier 2 Section 7.8.1.1.2 but retained in Tier 1. DCD Tier 2 Section 7.8.1.1.4 still refers to the deleted text. e. DCD Tier 2 section 7.8.1.1.2 list manual ATWS mitigation initiation signal in bullets 1 and 5. These appear to be the same signal. The DCD Tier 2 section 7.8.1.1.2 bullets are nominally a list of command signals but the 1st bullet has 3 signals, the 2nd and 3rd bullet have 1 signal and the 4th and 5th signal appear to be descriptive text. Clarify the ATWS ARI initiation signals. f. DCD Tier 1 provides an inconsistent treatment of manual initiations identified in Tier 2. A manual ATWS initiation signal is retained in the ATWS ARI function while the manual scram was deleted for the DPS scram. Various DCD Tier 2 sections indicate that there are diverse manual initiators for SCRRI/SRI, ADS inhibit, GDCS, ADS, ICS and SLC. DCD Tier 2 Section 7.8.3.3 reiterates the requirements but then concludes it conforms without substantiation. It appears 7.8.3.3 relies on manual system initiations in conformance with Item II.Q of SECY 93-087 and SRM on SECY 93-087. It is not clear whether DCD Tier 1 Tables 2.2.14-2 & 3 are intended to have distinct initiators or whether there is

			intended overlap between the two tables. Example: What functions are initiated as a result of a manual scram (DPS)? Is the initiation of the ATWS ARI included? The manual scram was removed from the initiators for the ATWS ARI in the last revision. g. DCD Tier 2 Section 7.8.1.2.5 identifies that the DPS trips the feedwater pumps on high RPV water level (Level 9). This trip is also identified in DCD Tier 2 Section 7.8.1.2 but was deleted from DCD Tier 1 Table 2.2.14-2 in DCD revision 5. DCD Tier 2 Section 7.8.1.2 includes a feedback runback on high RPV water level (Level 8) that was deleted from DCD Tier 2 Section 7.8.1.2.5 and DCD Tier 1 Table 2.2.14-2 in DCD revision 5. h. ATWS Mitigation Logic Figure 7.8-3 does not show a RPV WR Water Level 1 setpoint initiator for the SLC system initiation. DCD Tier 1 Table 2.2.14-2 does list a Level 1 initiator without inclusion with the SRNM permissive or time delay. The list above should not be considered comprehensive. GEH should ensure that DCD Tier 2 ATWS and DPS functions and initiators are included in Tier 1 and vice versa.
RAI 9.3-43	Hinson C	Verify that the PSS sample stations have been designed to minimize personnel doses and contamination of the facility during operation and inspection. Estimate the annual collective dose associated with the routine use of the PSS sample stations and verify that this	10 CFR 20.1101 (b) states, in part, that the licensee shall use procedures and engineering controls based on sound radiation protection principles to achieve occupational doses that are as low as is reasonably achievable (ALARA). In DCD Section 9.3.2, the applicant states that ALARA is considered in station layout and design and contains a description of several design features to prevent plateout and minimize the buildup of crud in sampling piping lines. However, Section 9.3.2 does not describe how the design of the Process Sampling System (PSS) sample stations incorporate shielding and other design features described in RG 8.8 to minimize personnel doses and to minimize contamination, in accordance with 10 CFR 20.1406. It is also not clear whether the applicant has estimated the doses associated with taking samples from the PSS sampling stations that are described in Section 9.3.2 and whether these doses have been included in the dose assessment tables in Section 12.4 of the DCD.

		dose has been included in the dose assessment tables in Section 12.4 of the DCD.	1) Verify that the PSS sampling stations have been designed to ensure that doses to personnel who must operate, service, or inspect these sampling stations will be ALARA and describe some of the ALARA design features (e.g., radiation shielding and other ALARA features described in RG 8.8) incorporated in these sample stations to minimize personnel doses. 2) Describe some of the design features of the PSS sampling stations that will minimize contamination of the facility during the taking of samples, in accordance with the requirements of 10 CFR 20.1406. 3) Provide an estimate of the annual personnel collective dose associated with the routine use of the PSS sample stations. Verify that the doses associated with taking samples from the PSS sampling stations described in Section 9.3.2 have been included in the dose assessment tables in Section 12.4 of the DCD.
RAI 9.3-44	Georgiev G Sastre-Fuente E	Identify the type and location of process sampling for the spent fuel pool.	To meet the requirements of GDC 60 and 63, SRP 9.3.2 recommends that samples are taken from the spend fuel pool. DCD Tier 2 Section 9.3.2 states that samples are taken from the Fuel and Auxiliary Pools Cooling System (FAPCS) at the reactor building sample station. DCD Tier 2 Section 9.3.2 also list several pools in the reactor building monitored by FACPS but not the spent fuel pool. DCD Tier 2 Table 9.3-1 identifies the types of process measurements are taken from FAPCS. However, as listed in DCD Tier 2 Table 9.1-1, the spent fuel pool is in the fuel building, which no sample station according to DCD Tier 2 Section 9.3.2. Identify what process sampling is being proposed for the spent fuel pool and other fuel building pools and provide the typical process measurements that will be conducted (continuous and grab). Identify where the process samples will be processed.

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