PWROG comments on the NRC Draft Safety Evaluation for Topical Report (TR), WCAP-17867-P, Revision 1
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COMMENT NUMBER	DSE AND LINE NUMBER	COMMENT	JUSTIFICATION
1	Page 13, Lines 23-24	Revise the text from: Different keys are provided for Train A and Train B cabinets (to allow administrative control of access). To: Each train is capable of being locked to allow for administrative control of access.	Not all SSPS' have different keys for each train.
2	Page 13, Lines 24-25	Revise the text from: Each train consists of three cabinets: Input, Logic, and Output. To: For a 3-bay SSPS, each train consists of three cabinets: Input, Logic, and Output. For a 4-bay SSPS, each train consists of four cabinets: Input, Logic, and two Output.	Some 4-loop SSPS plants require additional Slave Relays to accomplish all ESFAS protection functions. This is done by adding a second Output Relay Cabinet.
3	Page 13, Lines 24-25	Revise the text from: The new-design boards will be installed into the Logic cabinets. To: Additionally, each train is provided with a Demultiplexer cabinet to interface with the main control board and plant computer (if applicable). The new-design boards will be installed into the Logic and Demultiplexer cabinets.	The changes reflect the as-built system, i.e., new design boards will be installed in the Logic Cabinet, as well as Demultiplexer Cabinet.
4	Page 13, Line 40	Revise the text from:	By design, the ULB outputs provide decision logic signals to the UVD input. The UVD provides a nominal 48vdc output to the

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		The undervoltage coils of the reactor trip breakers are supplied directly from the logic. To: The undervoltage driver (UVD) board receives inputs signals from the ULB voting logic circuits. The undervoltage coils of the reactor trip breakers are supplied directly from the UVD board located in the logic bay of the associated train	UVTA UV coil in the reactor trip and bypass breakers.
5	Page 14, Lines 1-2	Revise the text from: The logic boards also operate master relays which then operate slave relays for engineered safety features actuation. To: The safeguards driver (SGD) board receives inputs signals from the ULB voting logic circuits. The SGD boards operate master relays which then operate slave relays for engineered safety features actuation.	By design, the ULB outputs provide decision logic signals to the SGD input. The SGD provides output signals to energize the assigned Master Relays.
6	Page 14, Line 12	Revise the text from: The analog portion of the protection system, the logic… To: The process instrumentation portion of the protection system…	Some plants (e.g., Watts Bar) use the Eagle digital instrumentation system equipment for process channel inputs; i.e., not all plants are analog.
7	Page 14, Lines 19-20	Revise the text from: …under test are inhibited; however, these	While the original design basis assumed that the logic testing could be performed in a very short period of time (about thirty minutes or less), the realities of today's plant requirements, administrative controls, and

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		tests can be performed in less than ten minutes. To: …under test are inhibited. The typical time to complete a logic test is about two – three hours. The time allowed to complete logic testing is defined by the plant-specific Technical Specifications.	human performance measures result in a typical test time of 2-3 hours. The Technical Specification bypass test time and Completion Time for SSPS testing and maintenance are defined based on the plant-specific licensing bases, including the NRC approved versions of WCAP-10279 and Supplements 1 & 2, WCAP-14333, and/or WCAP-15376.
8	Page 14, Lines 22-23	Revise the text from: The logic is tested semi-automatically, one trip or control function at a time, using fast pulse testing techniques. To: The logic is tested semi-automatically, one trip or ESF protection function at a time, using fast pulse testing techniques.	While there are a few "control" types of functions generated by the SSPS (e.g., NIS SR HV Cutout and RCP Bus UF Trip of the RCP Breakers), the logic for most voting logic circuits are reactor trip or ESF functions. Regardless, all of the voting logic functions (reactor trip, ESF, and control) are tested.
9	Page 14, Lines 31-32	Revise the text from: Means are provided for testing the multiplexers for testing the operability of the test circuit. To: Means are provided in each train for monitoring test switch positions, multiplexing and input inhibit switch positions, circuit board connector seating, bypass breaker position, and master relay testing configuration.	These are critical parameters being monitored for system operation by the GW Alarm (or equivalent) circuit. The testing of the semi-auto tester is discussed in 7.b above. This test is performed at the beginning of every Tech Spec Actuation Logic test to ensure the tester is operating correctly.
10	Page 14, Lines 34-36	Revise the text from: An alarm system and an annunciator in the control room are provided for each train. If trouble in both trains should develop simultaneously, the alarm system will	The GW is a separate circuit hardwired to the MCB for annunciation and interlocked in the train to provide a reactor trip.

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		automatically trip the reactor. To: A system status alarm for each train is annunciated in the control room. The alarm is generated by the associated train General Warning circuit. If a General Warning condition should develop simultaneously in both trains, the General Warning circuits will automatically trip the reactor. This design feature is in addition to the bypass breaker interlock trip feature discussed in No. 4	
11	Page 19, Lines 38-40	Revise this statement to: …addressed vendor controls with regard to the design vendor of the circuit boards, as well as the manufacturing vendors of the circuit boards.	The names of the design and manufacturing vendors where deleted so that the FSE will not contain any Proprietary information.
12	Page 20. Line 16	Revise this statement to: …the Westinghouse documented interactions with the design vendor.	The name of the design vendor was deleted so that the FSE will not contain any Proprietary information.
13	Page 20, Line 31	Revise this statement to: …programmable logic device to be a CPLD.	The name of the CPLD vendor was deleted so that the FSE will not contain any Proprietary information.
14	Page 21, Lines 19-25	Revise these statements to: Also, there are five critical characteristics (CCs) listed in Westinghouse's CDI document sent to the manufacturing vendor of the circuit boards through purchase orders for each type of new-design board. The manufacturing vendor of the circuit boards is responsible for performing "product verifications," "physical	The names of the design and manufacturing vendors where deleted so that the FSE will not contain any Proprietary information.

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		inspection," and evaluation of "performance characteristics" of the new-design boards. The last of the five CCs is "configuration control" which is verified by Westinghouse through a Method 2, "Commercial Grade Survey," of the manufacturing vendor of the circuit boards, which verifies that their manufacturer practices have acceptable supplier controls.	
15	Page 31, Lines 37-41	Revise the text from: The NRC staff considers the post installation test as an effective means of providing an additional measure of independent testing assurance to meeting the requirements. Therefore, the NRC staff is recommending a plant specific action item to ensure a post installation test is performed to demonstrate proper system function(s) associated with the affected card slots of each new circuit board installed. To: The NRC staff considers the post installation test as an effective means of providing an additional measure of independent testing, i.e., assurance to meeting the requirements. Therefore, the NRC staff is recommending a plant specific action item (4.2.3) to ensure a post installation test is performed to demonstrate proper system function(s) associated with the affected card slots following the installation of one or more new design ULB, UVD, SGD and/or SAT printed circuit boards in either SSPS train. The post installation test is satisfied by the performance of	The revised text clarifies when a post installation test is required to be performed, based on replacing specific SSPS boards that could impact SSPS operability, and also identifies that the post installation test is satisfied by the performance of an Actuation Logic Test Surveillance, or an equivalent logic test. The plant specific action item number was also added to the text.

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		an Actuation Logic Test Surveillance, or an equivalent logic test, which demonstrates the operability of the SSPS, as required by the plant Technical Specifications.	
16	Page 32, Lines 37-44	Revise the text from: The NRC staff concludes with reasonable assurance that the V&V effort has adequately traced acceptance criteria for each testable requirement and concluded that no issues have been introduced in the design process that may affect the new design circuit boards from meeting the requirements and operating conditions of the original circuit boards. Also, sufficient independence has been demonstrated with regards to the entities performing the checking function inclusive of the Utility Beta Test Program and the site specific action item to demonstrate operability using logic test surveillance procedures following the installation of any new redesigned SSPS circuit board. To: The NRC staff concludes with reasonable assurance that the V&V effort has adequately traced acceptance criteria for each testable requirement and concluded that no issues have been introduced in the design process that may affect the new design circuit boards from meeting the requirements and operating conditions of the original circuit boards. Also, sufficient independence has been demonstrated	The revised text clarifies when a post installation test is required to be performed, based on replacing specific SSPS boards that could impact SSPS operability, and also identifies that the post installation test is satisfied by the performance of an Actuation Logic Test Surveillance, or an equivalent logic test. The plant specific action item number was also added to the text.

COMMENT NUMBER	DSE AND LINE NUMBER	COMMENT	JUSTIFICATION
		with regards to the entities performing the checking function inclusive of the Utility Beta Test Program and the plant specific action item (4.2.3) to demonstrate SSPS operability following the installation of one or more new design ULB, UVD, SGD and/or SAT printed circuit boards in either SSPS train. The post installation test is satisfied by the performance of an Actuation Logic Test Surveillance, or an equivalent logic test, which demonstrates the operability of the SSPS, as required by the plant Technical Specifications.	
17	Page 32, Lines 44-47	Revise the text from: …as a secondary or second verification, a post installation logic test to demonstrate different characteristics or requirements are met. This verification is the post installation system logic test to be done following the installation of any new redesigned SSPS circuit board. To: …as a secondary or second verification, a post installation actuation logic test to demonstrate that different characteristics or requirements are met. This verification is the post installation system test that will be performed following the installation of one or more new design ULB, UVD, SGD and/or SAT printed circuit boards in either SSPS train. The post installation test is satisfied by the performance of an Actuation Logic Test Surveillance, or an equivalent	The revised text clarifies when a post installation test is required to be performed, based on replacing specific SSPS boards that could impact SSPS operability, and also identifies that the post installation test is satisfied by the performance of an Actuation Logic Test Surveillance, or an equivalent logic test. The plant specific action item number was also added to the text.

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		logic test, which demonstrates the operability of the SSPS, as required by the plant Technical Specifications. This is plant specific action item 4.2.3.	
18	Page 34, Line 18	Revise the text from: …circuit boards is inclusive of the post installation test as a plant specific action item. All… To: … circuit boards is inclusive of the post installation test as a plant specific action item (4.2.3). The post installation test will be performed following the installation of one or more new design ULB, UVD, SGD and/or SAT printed circuit boards in either SSPS train. The post installation test is satisfied by the performance of an Actuation Logic Test Surveillance, or an equivalent logic test, which demonstrates the operability of the SSPS, as required by the plant Technical Specifications.	The revised text clarifies when a post installation test is required to be performed, based on replacing specific SSPS boards that could impact SSPS operability, and also identifies that the post installation test is satisfied by the performance of an Actuation Logic Test Surveillance, or an equivalent logic test. The plant specific action item number was also added to the text.
19	Page 35, Lines 22-24	Revise the text from: The intent to require no system input or output interface changes and integration, to no limit, of old vs. new-design boards has been a controlling point throughout the development and manufacturing process. To: The intent to require no system input or output interface changes and the integration/replacement of the current	The revision clarifies that the objective of the design and manufacturing process was to replace some, or all, of the original design boards with the new design boards.

COMMENT NUMBER	DSE AND LINE NUMBER	COMMENT	JUSTIFICATION
		design boards with the new design boards was the objective of the development and manufacturing process.	
20	Page 35, Lines 26-28	Revise the text from: …discussions with Westinghouse NRC staff yielded a conclusion these are technical issues that have no safety concerns associated. To: …discussions with Westinghouse lead to a conclusion that these are multiplexing technical issues associated with plant-specific operating procedures and computers that have no safety concerns associated with them.	The revision clarifies that this issue is related to plant-specific equipment (i.e., plant computers) and the operating practice to operate with the SSPS in the A+ B multiplexing mode.
21	Page 37, Lines 3-5	Revise the text from: However, the NRC staff has considered the additional independent activities conducted under the Utility Beta Test Program and the logic test surveillances to be performed as site-specific testing. To: However, the NRC staff has considered the additional independent activities conducted under the Utility Beta Test Program and the post installation test that will be performed following the installation of one or more new design ULB, UVD, SGD and/or SAT printed circuit boards in either SSPS train. The post installation test is satisfied by the performance of an Actuation Logic	The revised text clarifies when a post installation test is required to be performed, based on replacing specific SSPS boards that could impact SSPS operability, and also identifies that the post installation test is satisfied by the performance of an Actuation Logic Test Surveillance, or an equivalent logic test. The plant specific action item number was also added to the text.

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		Test Surveillance, or an equivalent logic test, which demonstrates the operability of the SSPS, as required by the plant Technical Specifications. This is plant specific action item 4.2.3.	
22	Page 51, Lines 42-45 Page 52, Lines 5-8	Delete the text: There are still a few plants for which an additional evaluation is required to confirm whether the seismic testing completed can be considered to envelope the vertical direction seismic requirements…. A few plants still require additional analyses to conclude the seismic testing completed can be considered to envelope the vertical direction seismic requirements. See Plant Specific Action Item No. 4.2.6 (Section 4.2.6).	An additional evaluation was performed and is referenced in the TR (WCAP-17867-P Rev. 1) in Section 8.2.4 - EQ-EV-93 (Reference 62). See EQ-EV-93 Section 5, the 3rd paragraph.
23	Page 53, Lines 29-33	Delete the text: The NRC staff agrees with this reasoning; however, licensees should perform site-specific evaluations to verify that the location of the SSPS cabinets into which the new-design boards will be installed are not near any magnetically sensitive equipment. See Plant Specific Action Item No. 4.2.2 (Section 4.2.2).	The terms such as “near” and “magnetically sensitive equipment” allow for subjective, non-quantitative engineering judgment. The basis for the specific action is not clear. The acceptance criteria for RE101 is based upon magnetic field magnitudes measured at 7 cm. This effectively is the SSPS cabinet boundary, thereby allowing for a generic fleet evaluation. This supports the Westinghouse position for exempting this test.
24	Page 55, Lines 11-14	Delete the text: Licensees should confirm that the expected levels of EMI/RFI within the vicinity of their site-specific locations of SSPS cabinets will not exceed the levels depicted in the table. See Plant Specific Action Item No. 4.2.3 (Section 4.2.3).	While each plant must assure by some method that the SSPS cabinets operate in areas that do not exceed the limits defined by the EQ tests, plant-specific EMI/RFI mapping is not required. The Westinghouse testing shows that the new design boards meet the guidelines of RG 1.180. RG 1.180 references EPRI TR-102323 (which the Staff has endorsed via an SE in 1996). EPRI TR-102323 is a generic report used to support the installation of digital components in NPPs.

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			The report and guidelines are in part based on "composite" data from 7 typical power plants. Plant-specific procurement and design processes are based on the TR-102323 guidance. Each plant should not be required to provide plant-specific EMI/RFI mapping data.
25	Page 64 Line 47-48	Revise the text from: The independence between these two trains is maintained by existing features outside the new-design boards; therefore no… To: The independence between these two trains of protective functions is maintained by existing features outside the new design boards; therefore no…	The new design ISO boards continue to provide electrical separation and thus independence between the two trains for functions unrelated to protective actuations.
26	Page 65, Line 15	Add a conclusion to the text: Therefore, the two independent trains of the SSPS continue to meet the single failure criterion. Add the following text: The new design boards do not introduce a CCF or new failure mode; therefore, the redundant trains continue to meet to the single failure criterion.	With respect to single failure criterion the conclusion for this section should also note that new design boards do not introduce a CCF or new failure mode; therefore, the redundant trains continue to meet to the single failure criterion. This is because one Staff concern with of implementation of new design SSPS boards at Shearon Harris was the potential introduction of a CCF that could impact both trains. If this conclusion is not added here, then it should be added elsewhere.
27	Page 69, Lines 47-48	Revise the text from: Since the SSPS does not include connections between redundant portions, this evaluation only considers applicability between…	This is not accurate, since the SSPS includes connections between the redundant portions. Page 68 Line 35 states that the redundant portions connect to each other but through isolation devices. Therefore, page 69 lines 34-39 contradicts Page 68 Line 35, and is inaccurate.

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		To: Since the SSPS does not include non-isolated connections between redundant portions, this evaluation only considers the applicability between…	The isolation boards provide a barrier between the two trains for the clock sync, counter sync, and A+B signal. The synchronizing of the clock and counter ensures the indication functions work appropriately.
28	Page 71, Lines 5-7	Revise the text from: The DEC board is involved in testing to the extent that the DEC board outputs to the main control board indicators and to the plant computer are inhibited during testing. To: The ISO board is involved in testing to the extent that the ISO board outputs to the main control board Demultiplexer and to the plant computer Demultiplexer (if applicable) are inhibited during testing.	The DEC board supplies the addresses to the ULB for multiplexing. The addresses do not pass to the Demultiplexer. The addresses in the multiplexer are generated by the DEC board in the Demultiplexer from the clock signals from the train. The ISO board outputs are inhibited for the multiplexing data. The DEC manual test switch provides a means to stop on a specific address which could assist in troubleshooting a multiplexing issue.
29	Page 80, 7-9, Page 80, Lines 18-19	Revise the text to: The configuration management of the CPLD is controlled by the assembly drawing, artwork drawings, artwork Gerber files, configuration file and the chip manufacturer software tool, all of which are archived in EDMS. The chip manufacturer software tool is included in the CPLD configuration file in EDMS.	The name of the CPLD vendor was deleted so that the FSE will not contain any Proprietary information.
30	Page 83, Lines 32-	Revise the text from:	This is not part of the GW alarm, since two GW alarms are required trip the plant. The

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	33	…includes test failure reporting through board edge LEDs and the general warning alarm, if so configured. To: … includes test failure reporting through board edge LEDs.	alarm (e.g. Train trouble) is separate such that it will be annunciated by a train and not result in a trip, if both trains that have a test error. The annunciator response will be same as a GW alarm. This change is not part of this TR and should be deleted from the DSE.
31	Page 86, Line 43	Add the following text prior to the first paragraph: The continued operation of the Westinghouse SSPS is dependent on the availability of new design printed circuit boards. The original SSPS circuit boards have been redesigned using programmable logic devices (i.e., a CPLD). Based on the evaluations, audits, and technical reviews summarized in this Safety Evaluation, the NRC staff concludes that the new design SSPS boards can be used to replace the original design boards. The NRC staff's evaluation of the Westinghouse processes implemented during the development and production of the new design boards represent a modification to the NRC staff's evaluation process currently applied to the review of digital safety systems. Therefore, the NRC staff's evaluation focused on a review of the evidence provided by Westinghouse to make a determination as to whether the regulatory requirements for a high-quality development process have been adequately addressed. The following provides a summary of the NRC staff's	The additional text contains excerpts from the DSE and provides a summary of the NRC key NRC Staff conclusions discussed in the body of the DSE.

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		conclusions regarding this TR. The validation testing identified no issues that would preclude the new design boards from meeting the requirements and operating conditions of the original design circuit boards. The NRC staff concludes with reasonable assurance, that the V&V effort has adequately traced the acceptance criteria for each testable requirement and concluded that no issues have been introduced in the design process that may affect the new design circuit boards from meeting the requirements and operating conditions of the original design circuit boards. A comprehensive set of functional and system operational tests was conducted on the prototypes from the design vendor to ensure that the design of the new design boards met the requirements to be used as circuit board replacements in the SSPS. The design cannot be changed without affecting the revision level of the controlled file, and the CPLD configuration files are controlled by design processes. The results of the manufacturing tests provide reasonable assurance that the manufacturing process has not introduced an error or deficiency that could ultimately affect the safety function of the new circuit board. The required functionality of the SSPS new design circuit boards has been tested to demonstrate that their performance is identical to the original design circuit boards' functional requirements. The design specification	

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		included the system requirements from the original SSPS system description, system standard, and the circuit board schematic drawings. The system testing was consistent with the current safety system design description and the new design boards were verified to operate within the same system parameters as the original design boards. The NRC staff has reasonable assurance that the functionality of the new design circuit boards has been evaluated and tested to meet the system requirements. The calculated MTBF for the new design circuit boards is greater than the MTBF for the original design circuit boards. The NRC staff evaluation of the qualification program included: (1) atmospheric, (2) power supply fluctuations, (3) radiation, (4) seismic, and (5) electromagnetic/radiofrequency interference. The temperature and humidity qualification tests were performed consistent with the approved test methodology. The power supply qualification testing and power quality analysis was determined to be acceptable. The SSPS cabinets are located in very low radiation dose zones and the WCAP-8587(R6)-A (NP) analysis continues to be applicable. The seismic qualification was performed in accordance with the recommended practices and the requirements of GDC-2 and Appendix A to 10 CFR Part 100 have been appropriately addressed. The EMI/RFI qualification testing was performed	

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		consistent with the intent of RG 1.180 and RG 1.209, and the requirements of GDC-4 have been appropriately addressed for EMI/RFI effects. Therefore the appropriate conditions and procedures for qualification have been appropriately applied to the environmental qualification of the new design boards. The performance of the new design boards have time responses that are within the bounding times allowed for in the time response testing elimination analysis in a manner that is consistent with the NRC staff's Safety Evaluation for WCAP-14036-P-A, Rev. 1. This conclusion applies to as-built configurations with only new design boards or combinations of new and original design boards used to provide reactor trip or ESF actuation functions. For the purpose of minimizing the potential for a CCF from the new design boards, Westinghouse performed various analyses. The new design ULB, SGD, and UVD boards process the SSPS safety-related signals. These three boards each contain a main CPLD and a test CPLD. Each main CPLD was analyzed to determine if there was a potential of a design feature that could result in a CCF. In addition, each of the three test CPLDs was analyzed for potential adverse impacts on the main CPLD. In addition, a failure modes and effects analysis was performed for each board by an independent group to determine the impact of component failures. The analyses that were performed are	

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		consistent with good engineering practices and eliminate the potential for a CCF. In addition, Westinghouse performed an analysis of all the circuits on the CPLD using the appropriate vendor supplied tool, with the intention of demonstrating that the testing performed met the "testability" criteria in BTP 7-19, Section 1.9(2), in order to eliminate the consideration of a CCF. This analysis demonstrated that not all possible sequences were tested, and included an additional analysis that the untested sequences did not need to be tested, since they were functionally irrelevant. These analyses and testing are sufficiently rigorous and complete to allow the NRC staff to eliminate the consideration of a CCF. No diverse actuation system is required to address CCF of the new, CPLD-based SSPS boards. There are no digital communications between the redundant trains (divisions) of the SSPS. Each independent train communicates to the main control board and (if applicable) the plant computer demultiplexers. This communication is through multiplexed data lines that are electrically isolated by ISO boards. In addition, the communication is one way out from the SSPS through an LED/Photo-diode circuit. Since the new design boards do not change the SSPS design, which does not allow interdivisional communication, the new design boards meet the Independence criterion. The Westinghouse FMEA studies	

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		demonstrated that there are no non-detectable failures that when considered with a detectable failure, would cause a loss of safety function, and that the new design boards do not produce a different failure mode than has been previously analyzed. The FMEAs demonstrated that here are no undetectable failures that could inhibit the safety function, and therefore demonstrate that the single failure criterion is met. The FMEAs also demonstrate that the SSPS, with the new design boards installed, will fail in the specified fail-safe state or into a state demonstrated to be acceptable on some other defined basis. Since the FMEAs show there are no undetectable failures that could adversely impact the safety functions of the new design SSPS boards, the two independent trains of the SSPS continue to meet the single failure criterion. The reliability assessment demonstrates that the reliability of the new design boards is at least as good as the reliability of the original design boards; therefore the reliability of the new design boards is acceptable. The new design boards are relatively simple, such that it is possible to completely analyze and test the safety functions of these boards to detect any unwanted logic configuration. Through the analysis of the final design CPLD logic configuration using the vendor supplied chip viewer tool, and through almost complete testing by Westinghouse, as well as independent Beta testing that was performed by	

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		PWROG, the applicant has ensured that there is no unwanted logic configuration in the final controlled version of the new design boards that perform the safety functions. Since there are no digital communications to the new CPLD-based design SSPS boards while they are installed in the SSPS cabinets, there are no electronic integrity threats (when the SSPS is required to be operable) that must be addressed. The SSPS consists of two independent trains, the complete failure of either one will not prevent the SSPS from accomplishing its safety functions. The independence between these two trains of protective functions is maintained by current features that are outside of the new design boards. In addition, periodic testing ensures that the SSPS is capable of performing its safety functions, and that there are no failures in the system that would inhibit the safety functions from being performed. Based on this review, the NRC staff has reasonable assurance that the new design SSPS printed circuit boards are a more reliable upgrade to the original design circuit boards, and include the necessary functional characteristics for the safety system to perform its safety function.	
32	Page 86, Lines 45-48 Page 87, Lines 1-5	Revise the text from: In general, the NRC staff finds that the new-design boards can be used to replace the vintage boards. However, the NRC staff finds that because each plant's configuration and operating	Beginning the Conclusion with the phrase "In general," does not provide a positive confirmation of the NRC Staff's determination that the installation of the new design SSPS boards is acceptable, as long as each licensee meets the plant specific action items contained in the DSE, and the OEM requirements.

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		conditions are unique, a licensee must confirm (before installing the new-design boards) that the tested qualification levels envelop the extreme conditions expected at its plant. The NRC staff also finds that the unique configuration of each plant makes it imperative that each licensee analyze whether the new-design boards can be installed under 10 CFR 50.59. Therefore, this SE addressed only the generic issues associated with installing the new-design boards. Licensees may reference this SE, as applicable, when performing a 10 CFR 50.59 determination. To: Based on the evaluations and technical reviews discussed herein, the NRC staff finds that the new-design SSPS boards can be used to replace the vintage boards. However, the NRC staff finds that because each plant's configuration and operating conditions are unique, a licensee must confirm (before installing the new-design boards) that the tested qualification levels envelop the extreme conditions expected at its plant. The NRC staff also finds that the unique configuration of each plant makes it important that each licensee analyze whether the new-design boards can be installed under 10 CFR 50.59 without prior NRC approval. Therefore, this SE addressed only the generic issues associated with installing the new-design boards. Licensees may reference this SE, as applicable, when performing a 10 CFR 50.59 Evaluation.	The use of the word " imperative" is excessive. If the Staff requires a plant to perform a plant-specific evaluation to determine if the new design boards can be installed under 10 CFR 50.59, then each licensee must do this; i.e., it is not optional. In fact, that is the purpose of performing a 10 CFR 50.59 Evaluation.

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33	Page 87, Lines 30-35	Delete the text: 4.2.2 Proximity to Magnetically Sensitive Equipment Prior to the installation of the new-design boards licensees should perform site-specific evaluations to verify that the location of the SSPS cabinets into which the new-design boards will be installed are not near any magnetically sensitive equipment. See Section 3.5.1.5, "Electromagnetic Interference/Radio Frequency Interference."	See the Justification for Comment 23: The basis for the specific action is not clear. The acceptance criteria for RE101 is based upon magnetic field magnitudes measured at 7 cm. This effectively is the SSPS cabinet boundary, thereby allowing for a generic fleet evaluation. This supports the Westinghouse position for exempting this test. The external emissions are less than those in RG 1.180.
34	Page 87 Lines 37-41	Delete the text: 4.2.3 Expected Levels of EMI/RFI Licensees should confirm that the expected levels of EMI/RFI within the vicinity of their site-specific locations of SSPS cabinets will not exceed the levels depicted in Table 8-4. See Section 3.5.1.5, "Electromagnetic Interference/Radio Frequency Interference."	See the Justification for Comment 24: While each plant must assure by some method that the SSPS cabinets operate in areas that do not exceed the limits defined by the EQ tests, plant-specific EMI/RFI mapping is not required. The Westinghouse testing shows that the new design boards meet the guidelines of RG 1.180. RG 1.180 references EPRI TR-102323 (which the Staff has endorsed via an SE in 1996). EPRI TR-102323 is a generic report used to support the installation of digital components in NPPs. The report and guidelines are in part based on "composite" data from 7 typical power plants. Plant-specific procurement and design processes are based on the TR-102323 guidance. Each plant should not be required to provide plant-specific EMI/RFI mapping data.
35	Page 88, Lines 14-19	Delete the text: 4.2.6 Additional Seismic Analysis A few plants **…** still require additional analyses to conclude the seismic testing completed can be considered to	See the Justification for Comment 22: An additional evaluation was performed and is referenced in the TR (WCAP-17867-P Rev. 1) in Section 8.2.4 - EQ-EV-93 (Reference 62). See EQ-EV-93 Section 5, the 3rd paragraph.

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		envelope the vertical direction seismic requirements. See Section 3.5.1.4, "Seismic Qualification."	
36	Page 88, Lines 21-30	Revise the text from: 4.2.7 Logic Test Surveillance Test Procedures Installation of one or more new redesigned circuit boards in either SSPS train requires performance of a Logic Test Surveillance procedure normally used to demonstrate operability of the SSPS within the plant Technical Specifications. This is typically performed but in the situation where it has not been planned, it is recommended to be completed. This is in support of the NRC staff's reasonable assurance finding with regards to the independent verification and equivalency testing of the manufactured circuit boards with the original design verification testing. See Section 3.4.3.1, "V&V Analysis and Reports" and Section 3.4.3.2, "Testing Activities." To: Technical Specification Actuation Logic Test Surveillance Installation of one or more new design ULB, UVD, SGD and/or SAT printed circuit boards in either SSPS train requires performance of an Actuation Logic Test Surveillance, or equivalent logic test, to demonstrate operability of	This revision makes the plant specific action item consistent with the revisions discussed in Comments 15, 16, 17, 18, and 21. The revised text clarifies when a post installation test is required to be performed, based on replacing specific SSPS boards that could impact SSPS operability, and also identifies that the post installation test is satisfied by the performance of an Actuation Logic Test Surveillance, or an equivalent logic test.

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		the SSPS, as required by the plant Technical Specifications. The performance of an Actuation Logic Test, or an equivalent logic test, supports the NRC staff's reasonable assurance finding with regards to the independent verification and equivalency testing of the manufactured circuit boards with the original design verification testing. See Section 3.4.3.1, "V&V Analysis and Reports" and Section 3.4.3.2, "Testing Activities."	