UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

May 7, 2021

LICENSEE: Entergy Operations, Inc.

FACILITY: Waterford Steam Electric Station, Unit 3

SUBJECT: SUMMARY OF APRIL 14, 2021, PARTIALLY CLOSED OBSERVATION MEETING WITH ENTERGY OPERATIONS, INC. REGARDING LICENSE AMENDMENT REQUEST TO INSTALL DIGITAL UPGRADE IN ACCORDANCE WITH DIGITAL INSTRUMENTATION AND CONTROL INTERIM STAFF GUIDANCE NO. 06, REVISION 2, "LICENSING PROCESSES" (EPID L-2020-LLA-0164)

On April 14, 2021, the U.S. Nuclear Regulatory Commission (NRC) staff held a virtual Observation public meeting with representatives from Entergy Operations, Inc. (the licensee) and its contract support staff. The purpose of the meeting was to discuss the licensee's amendment request dated July 23, 2020, as supplemented by letters dated January 22, January 29, March 5, and March 19, 2021 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML20205L588, ML21024A005, ML21029A156, ML21064A535, and ML21082A393, respectively), for the Waterford Steam Electric Station, Unit 3, regarding a replacement to an existing digital core protection calculator system (CPCS). The upgrade, if approved, would replace the existing CPCS with a Common Q-based system. The meeting notice and agenda, dated December 22, 2020, are available in ADAMS under Accession No. ML21036A265. A list of attendees is provided in Enclosure 1.

During the meeting, the NRC staff discussed its open items list, which is a list of NRC staff questions and informal licensee responses regarding the license amendment request for the NRC staff to track and eventually disposition as requests for additional information, requests for confirmation of information, audits, or as needing no additional action. The proprietary version of the open items list, which is being withheld from public disclosure, is in Enclosure 2. A redacted copy of the open items list is in Enclosure 3.

Enclosure 2 to this letter contains proprietary information. When separated from Enclosure 2, this document is DECONTROLLED.

During the public portion of the meeting, the NRC staff and licensee discussed the status of Open Item Nos. 24, 26, 33, 38, and 40. The NRC staff clarified that for Open Item No. 38, the staff will need information submitted on the docket that describes the licensee's change control process for the vendor oversight plan. The licensee discussed its plans to supplement its amendment request. The licensee also clarified that, regarding statements in the amendment request regarding Institute of Electrical and Electronic Engineers (IEEE) standards (Stds), the modification will meet IEEE Std 603-1991, "Criteria for Safety Systems for Nuclear Power Generating Stations," to be consistent with Interim Staff Guidance (ISG)-06, Revision 2, "Licensing Process," dated December 2018 (ADAMS Accession No. ML18269A259) but that its licensing basis requires the licensee to meet IEEE Std 279-1971, "Criteria for Protection Systems for Nuclear Power Generating Stations."

During the closed portion of the meeting, the licensee and its contract staff gave a presentation on a corrective action related to the CPCS design that does not affect the CPCS safety function. The NRC staff and licensee also discussed NRC's audit of the licensee's vendor oversight plan implementation of the requirements phase.

The NRC staff has determined that the open items list contains proprietary information pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 2.390, "Public inspections, exemptions, requests for withholding." The proprietary information is indicated by bold text enclosed within **[[double brackets]]**. The proprietary version of the open items list is provided as Enclosure 2. Accordingly, the NRC staff has also prepared a nonproprietary version of the open items list which is provided as Enclosure 3.

The NRC staff did not make any regulatory decisions or commitments at the meeting. No members of the public identified themselves on the teleconference. The NRC staff did not receive any Public Meeting Feedback forms.

Please direct any inquiries to me at 301-415-1383 or by e-mail to Perry.Buckberg@nrc.gov.

/RA Audrey L. Klett for/

Perry H. Buckberg, Senior Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-382

Enclosures:
1. List of Attendees
2. Open Items List (Proprietary)
3. Open Items List (Non-proprietary)

cc w/o Enclosure 2: Listserv

Enclosure 1

List of Attendees

LIST OF ATTENDEES

APRIL 14, 2021, VIRTUAL PUBLIC MEETING

WITH ENTERGY OPERATIONS, INC., ET AL.

WATERFORD STEAM ELECTRIC STATION, UNIT 3,

LICENSE AMENDMENT REQUEST TO INSTALL DIGITAL UPGRADE

U.S. Nuclear Regulatory Commission
Brent Ballard, NRR[1]/DORL[2]/LPL1[3]
Perry Buckberg, NRR/DORL/LPL4[4]
Samir Darbali, NRR/DEX[5]/ELTB[6]
Jennifer Dixon-Herrity, NRR/DORL/LPL4
DaBin Ki, NRR/DRO[7]/IOLB[8]
Audrey Klett, NRR/DORL/LPL1
Shiattin Makor, RIV[9]/DRS[10]
Richard Stattel, NRR/DEX/EICB[11]
Tarico Sweat, NRR/DSS[12]/STSB[13]
Dan Warner, NSIR[14]/DPCP[15]/CSB[16]
Tom Wengert, NRR/DORL/LPL4
Deanna Zhang, NRR/DRO/IQVB[17]
Jack Zhao, NRR/DEX/EICB

Members of the Public
None introduced

Entergy Operations, Inc.
Jacob Champagne
Phil Couture
Remy DeVoe
Ron Gaston
Loren Miller
Roger Rucker
John Schrage
Christopher Talazac
William Truss

Jensen Hughes, Inc.
Alan Harris

Sargent and Lundy
Pareez Golub

Westinghouse Electric Company, LLC
Warren Odess-Gillett
John Wiesemann

[1] Office of Nuclear Reactor Regulation
[2] Division of Operating Reactor Licensing
[3] Plant Licensing Branch I
[4] Plant Licensing Branch IV
[5] Division of Engineering and External Hazards
[6] Long Term Operations and Modernization Branch
[7] Division of Reactor Oversight
[8] Operator Licensing and Human Factors Branch
[9] Region IV
[10] Division of Reactor Safety
[11] Instrumentation and Controls Branch
[12] Division of Safety Systems
[13] Technical Specifications Branch
[14] Office of Nuclear Security and Incident Response
[15] Division of Physical and Cyber Security Policy
[16] Cyber Security Branch
[17] Quality Assurance and Vendor Inspection Branch

Enclosure 3
(Non-proprietary)

Open Items List

Proprietary information pursuant to Section 2.390 of title 10 of the *Code of Federal Regulations* has been redacted from this document.

Redacted information is identified by blank space enclosed within [[double brackets]].

No.	IMS ID	Topic & (Reviewer)	LAR/LTR Section	LAR/ LTR Page	NRC Comment / Open Item Description	Licensee Response	Status	Audit, RAI or RCI No.
					Acronyms and abbreviations are defined on the last page of this document.			
-	-	-	-	-	**Certrec IMS Request ID Format (second column of this table)** A- Audit (Generic/Multiple Documents) CCF-Common Cause Failure/D3 EQ- Equipment Qualification HFE – Human Factors Engineering PSAI- Plant Specific Action Items RC- Regulatory Commitments RT- Response Time SA- System Architecture SDOE- Secure Development and Operational Environment ST- Surveillance Testing/Self-Diagnostics/SR Elimination SDP- System Development Processes, including SPM PSAIs TS- Technical Specifications VOP- Vendor Oversight Plan	Updated by Entergy on 10/19/20 Proprietary Documents will be uploaded to the Westinghouse Sharepoint site at the below address **[[** **]]**	-	-
1	ST-01	Self-Tests (Jack Zhao, Richard Stattel, Samir Darbali)	B.2.5	B-5	The BTP 7-17 Evaluation conclusion states that "*It is not possible to test self-diagnostics as part of surveillance testing because it would require creating destructive faults within the I&C system, such as Random-Access Memory (RAM) errors.*" Though this is a quote out of the Vogtle LAR safety evaluation, it is a statement made by the licensee and not the NRC to address this criterion in BTP 7-17, "self-test functions should be verified during periodic functional tests." The interpretation being made that the BTP criterion calls for complete functional testing of the self-diagnostic functions is incorrect. Instead, the BTP states that the licensee should "confirm the execution of self-diagnostic tests during plant operation" and the NRC staff believes that it is possible to do so by implementing the following necessary plant monitoring activities as already included in the Enclosure for this LAR. The licensee (Waterford) has addressed this in the LAR as follows: "Post installation, CPCS operability will be verified using 1) the automated diagnostics credited in this LAR (i.e., as described in LTR Appendix B), 2) Technical Requirements Manual (TRM) 3/4.3.1, "Reactor Protective Instrumentation" and associated surveillance procedures; and 3) Waterford TS 6.5.1.8, "Surveillance Frequency Control Program (SFCP)." A failure of credited automated diagnostics to detect a fault will be either detected by other diagnostics in the system or by checker(s) of diagnostics. This condition will be alarmed and displayed on the main control room (MCR) operator modules (OM) and/or the main control room annunciators. Upon receipt of an alarm or abnormal conditions, the station operating procedures will require the operators to perform system checks and verify operability of the CPCS deviation / function. The procedure will direct the operator to dispatch a maintenance technician to determine the source of the alarm as needed."	(Entergy 11/3/20 Update) The LAR Enclosure Section 2.3, Reason for the Proposed Changes, will be revised as follows: "Crediting Self-Diagnostics for TS Surveillance Requirement Elimination The Common Q design also provides additional reliability and operational margin via the self-diagnostics. These self-diagnostics are continually monitoring the health of the hardware and software. Appendix B to the Licensing Technical Report (LTR) (Attachment 4) and the Waterford System Engineer and Operations Actions Supporting TS SR Reduction (LAR Enclosure Section 3.4) provides the justification to remove selected SRs." Note: "and the Waterford System Engineer and Operations Actions Supporting TS SR Reduction (LAR Section 3.4) provides the justification to remove selected SRs" is new inserted text. The LAR Enclosure Section 2.4, Description of the Proposed TS Changes, for TS 3.3.1/Table 4.3-1, will be revised as follows: For row TS 3.3.1/Table 4.3-1, the sentence "LTR Appendix B provides the detailed justification that demonstrates that the self-diagnostics meet the requirements of 10 CFR 50.36 for the CPCS..." with "LTR Appendix B along with the Waterford System Engineer and Operations Actions Supporting TS SR Reduction (LAR Enclosure Section 3.4), provides the detailed justification that demonstrates that	Closed (V)	This is a proposed change to the LAR enclosure and not to the WCAP. Therefore I am unable to verify changes as of 2/25/2021.

					(W3F1-2020-0038 Page 18 of 27) The NRC staff agrees with the licensee's proposed actions in the LAR. So, for this LAR the licensee should cite both the credited self-diagnostic functions in Appendix B and proposed monitoring activities to justify the SR elimination in Section 2.2 of the LAR, not just the Appendix B. However, since Section 2.2 of the LAR cites Appendix B to WCAP-18464 as the sole justification for SR elimination (see Enclosure W3F1-2020-0038, Page 5 of 27) and Appendix B does not include any plant monitoring activity, it could lead to the misunderstanding that if the NRC accepts this LAR, it would also be accepting Appendix B as the only basis for the SR elimination. In addition, the LAR says on Page 18 of 27, in part, that "while LTR Appendix B states that monitoring is not required in order to credit self-diagnostic features". The NRC staff does not agree with this statement to address the above criterion in BTP 7-17. Furthermore, Appendix B says to leverage the Vogtle LAR for the SR elimination. But, the Vogtle LAR included plant monitoring activities as one of bases for the SR elimination. Therefore, the SR Elimination basis in both Section 2.2 of this LAR and Appendix B will need to include the licensee's commitment to perform self-diagnostic monitoring activities and the appendix B interpretations should be revised to establish consistency with the LAR.	the self-diagnostics meet the requirements of 10 CFR 50.36 for the CPCS..."		
2	ST-02	Self-Tests (Jack Zhao, Richard Stattel, Samir Darbali)	B.2.5	B-6	The bullet item on this page states the following: **[[** **]]**	(Entergy 11/3/20 Update) **PROPRIETARY RESPONSE** A. **[[** **]]** B. **[[** **]]**	Closed	Verified these changes are present in Revision 1 of WCAP 18484 on share point 3/11/2021.

						[[ ]]		
3	ST-03	Self-Tests (Jack Zhao, Richard Stattel, Samir Darbali)	TS BASES mark-up	52/377 81/377	Insert C includes the following statement: "The performance of channel checks validates that the self-diagnostics are continuing to perform their self-checking functions." It is not clear how a channel check can validate performance of self-diagnostics. Please provide clarification to allow the NRC staff to understand how channel checks can validate performance of self-diagnostics.	(Entergy 11/3/20 Update) **PROPRIETARY RESPONSE** The LTR Appendix B will be revised as follows: [[ ]] A Channel Check to review that these screens contain no alarms verifies that the system is functioning correctly.	Closed	Verified that changes are in Revision 1 of WCAP-18484 on 3/3/2021
4	ST-04	Self-Tests (Jack Zhao, Richard Stattel, Samir Darbali)	B.7.1	B-39	Appendix B of WCAP 18464 contains the following statement: [[ ]]	(Entergy 11/3/20 Update) **PROPRIETARY RESPONSE** This is correct. The sentence in the LTR will be revised as follows: [[ ]]	Closed	Verified that changes are in Revision 1 of WCAP-18484 on 2//25/2021. Noted that page numbering in Appendix B resets to 0

					[[ ]]	[[ ]]		after page B-37.
5	ST-05	Self-Tests (Jack Zhao, Richard Stattel, Samir Darbali)	B.3.2.1	B-10	The WCAP 18464 states: “IEC 60880 is comparable to IEEE 7-4.3.2, and the staff has found IEC 880 to be an acceptable equivalent”. This was a statement in the NRC original safety evaluation of Common Q which has been superseded. The statement has been removed from the current Common Q platform TR safety evaluation report. The NRC does not consider IEC 880 to be an equivalent to IEEE 7-4.3.2. As such, the NRC evaluates all digital systems to the criteria of IEEE 7-4.3.2.	Consistent with Westinghouse WCAP-18461, the following text will be deleted from the LTR (WCAP-18464): "B.3.2.1 Common Q Topical Report – NRC Safety Evaluation “The Common Q Platform diagnostics were developed under a robust process that was reviewed by the NRC. In 2000, the NRC issued a safety evaluation report (ML003740165, Bibliography 8) on the Common Q Topical Report (CENP-396-P, Rev. 01 which is the predecessor to WCAP-16097-P-A, Reference 4). In that report the NRC acknowledged receipt of Westinghouse document GKWF700777, "Design and Life Cycle Evaluation Report on Previously-Developed Software in ABB AC160, I/O Modules and Tool Software" (Bibliography 9) in support of the commercial dedication of the AC160. The safety evaluation report states that the, “AC160 PDS [Previously Developed Software] is composed of the AC160 software, S600 I/O Module(s) software, and ABB Tool software. The evaluation is based on the requirements specified in International Electrotechnical Commission (IEC) standard IEC-60880, "Software for Computers in the Safety Systems of Nuclear Power Stations." IEC 60880 is referenced in IEEE 7-4.3.2-2003, "IEEE Standard Criteria for Digital Computers in Safety Systems of Nuclear Power Generating Stations". IEC 60880 is comparable to IEEE 7-4.3.2-2003, and the staff has found standard IEC 880 to be an acceptable equivalent.” The Design and Lifecycle Evaluation (DLCE) applies to all aspects of the PDS including the system software that executes the nuclear application program and the diagnostics integrated with the system software. In other words, the same software quality approach applied to both aspects of the system software. The results of this report were discussed with the NRC staff during the licensing of the Common Q platform. The NRC also reviewed this document as part of their review of LAR 19-001 for Vogtle 3&4 (Reference 42)."	Closed	Verified that Section B.3.2.1 was deleted in Revision 1 of WCAP-18484. Note: The NRC did not ask for whole section to be deleted. Instead the staff only commented on one statement within the Section.
6	SA-01	Sys. Req. Spec. (Samir Darbali,	LAR 3.1 LTR 3		The licensee provided two CPCS System Requirements Specification (SyRS) documents: the reference CPCS design (Palo Verde) SyRS (00000-ICE-30158 (LAR Attachment 7 and LTR Reference 2)) and the WF3-specific	(a) As previously described to the NRC during the Acceptance Review discussions:	(a) Closed (a.1)	RAI for 6(b)

		Deanna Zhang)	LTR 5	5-1	"delta" SyRS (WNA-DS-04517-CWTR3 (LAR Attachment 8 and LTR Reference 21)). The staff noticed that the SyRS for the reference CPCS design (00000-ICE-30158) revision is Revision 14. The SyRS that was reviewed as part of the Palo Verde CPCS upgrade is Revision 7. The LAR and LTR make several inaccurate statements regarding which revision of 00000-ICE-30158 was previously reviewed by the NRC. For example: LAR Section 3.1 states: "The SyRS project document has a reference design document (Attachment 7), which has been previously reviewed by the NRC, and a "delta" document (Attachment 8) which describes differences for the Waterford project." LTR Section 5, item b. states: "The base system requirements for the WF3 CPCS is the CPCS System Requirements Specification (Reference 2), which have already been reviewed by the NRC as part of the Palo Verde CPCS replacement." LTR Section 5.2.4 states "As stated earlier, the reference design for the WF3 CPCS replacement is documented in Reference 2. These requirements and their traceability have already been reviewed and approved by the NRC as part of the Palo Verde CPCS replacement." Again, these statements are inaccurate because the SyRS that was reviewed for the Palo Verde CPCS upgrade review is Revision 7 of 00000-ICE-30158. The staff has not reviewed nor performed traceability of requirements for 00000-ICE-30158 after Revision 7. Additionally, the licensee has not demonstrated in the LAR or LTR that they have performed these activities. Clarification questions: • (a) Are the statements that the NRC staff had previously reviewed the SyRS (00000-ICE-30158) meant as background information, or for crediting the previous evaluation? • (b) Is the licensee performing independent design quality, traceability and other oversight activities for: o 00000-ICE-30158 Revision 7? o 00000-ICE-30158 Revisions 8 thru 14? o or only for the WF3-specific "delta" SyRS (WNA-DS-04517-CWTR3)? • (c) Slide 37 of the March 19, 2020 pre-application meeting identified the SyRS as a living document, as defined in ISG-06 (i.e., a document that will be revised as system development activities progress). Please clarify if this statement refers to 00000-ICE-30158, WNA-DS-04517-CWTR3, or both documents. 10/28/2020 Update:	• The intent of the statements in the Enclosure and LTR, as well as the entire paragraph in the Enclosure, was to communicate that the NRC has reviewed the overall design of the replacement CPC system in a previous license amendment (i.e., PVNGS 1, 2, and 3, Amendment No. 150; ML033030363). • It was not Entergy's intent to state, or even suggest, that the specific revision of the reference design document that was used for the Waterford CPC replacement (i.e., Revision 14) has been reviewed by the NRC, or that the NRC's review of the previous revision (i.e., Revision 7, submitted in ML032830027) could be used for the NRC's review of the Waterford project. However, Entergy understands how the wording of the statement is ambiguous in this respect. (b) 00000-ICE-30158, Rev 14, System Requirements Specification for the Common Q Core Protection Calculator System, is the basis document for WNA-DS-04517-CWTR3, System Requirements Specification for the Core Protection Calculator System. WNA-DS-04517-CWTR3 is the WF3 delta document for WF3. Requirements traceability is to WNA-DS-04517-CWTR3. When WNA-DS-04517-CWTR3, Rev 0, was reviewed and approved for owners acceptance per procedure EN-DC-149, the applicable sections of 00000-ICE-30158, Rev 14, were reviewed. Based on the regression analysis for n-th of kind systems described in WCAP-16096-P, "Software Program Manual for Common Q Systems," the only requirements traceability will be for the modified sections provided in WNA-DS-04517-CWTR3. There is a VOP audit action to compare the non-modified sections of 00000-ICE-30158, Rev 14, to the Requirements Traceability as part of the Requirements Traceability Matrix (RTM) VOP Audit. A regression analysis of the software is at a lower level of review than doing a regression analysis of the System Requirements Specification, and WF3 considered this review to be of greater value that a document review since this include the complete implementation of any changes. WF3 performed a regression analysis VOP audit of the current Palo Verde code (release 6.7), which was the base line for the WF3 project, to the Palo Verde initial code (release 5.0) to confirm the SPM was followed for design quality, requirements traceability, and IV&V including testing. 00000-ICE-30158, Rev 7 to Rev 13 were not specifically reviewed or audited, since these were not credited for any vendor oversight activity or project activity. The VOP audit of the regression analysis of the software was considered by WF3 to be the best method to access the difference from the Palo Verde software to be used as the baseline for the WF3 software. (c) Slide 37 of the March 19, 2020 pre-application meeting identified the SyRS as a living document, as defined in ISG-06 (i.e., a document that will be revised as system development activities progress). This statement refers to only WNA-DS-04517-CWTR3	Closed (b) Closed (c) Closed	

					(a.1) The last sentence of the response states that “However, Entergy understands how the wording of the statement is ambiguous in this respect.” Please explain if the LAR and LTR will be revised to address the ambiguous wording.	(a.1) Yes, the LAR Enclosure will be revised per the response to SA-01a. Yes, the LTR Section 3.3.4, System Requirements Documentation (D.2.3.3 and D.2.3.3.1), will be revised as follows: From: "Reference 2 is the CPCS System Requirements Document. It is the system requirements specification for the reference design for the Common Q CPCS. The reference design system requirements is based on two requirements documents that define the legacy CPCS functionality: - Functional Design Requirements for a Core Protection Calculator (Reference 36) and - Functional Design Requirements for a Control Element Assembly Calculator (Reference 37) The Common Q CPCS reference design system requirements specification (Reference 2) was developed to migrate the functional requirements of References 36 and 37) to a Common Q CPCS architecture. The result was the Palo Verde CPCS implementation. The existing Waterford CPCS is based on the same two functional design requirements documents (References 36 and 37). Therefore, the CPCS reference design is also applicable to the Waterford CPCS replacement plus additional changes to accommodate plant interface differences, requested licensee improvements, and changes in technology in the Common Q platform." To: "Reference 2 is the CPCS System Requirements Document for the reference design for the Common Q CPCS. The reference design system requirements is based on two requirements documents that define the legacy CPCS functionality: - Functional Design Requirements for a Core Protection Calculator (Reference 36) and - Functional Design Requirements for a Control Element Assembly Calculator (Reference 37) The Common Q CPCS reference design system requirements specification (Reference 2) was developed to migrate the functional requirements of References 36 and 37 to a Common Q CPCS architecture. The result was the Palo Verde CPCS implementation. *Note that Revision 7 of Reference 2 (ML032830027) was reviewed by the NRC.* The existing Waterford CPCS is based on the same two functional design requirements documents (References 36 and 37). Therefore, the CPCS reference design is also applicable to the Waterford CPCS replacement plus additional changes to accommodate plant interface differences, requested licensee improvements, and changes in technology in the Common Q platform. *Reference 2 is the current*		

						revision of the CPCS System Requirements Document for the reference design."		
7	SDP-01	SW Dev Plan (Deanna Zhang Samir Darbali)	LTR	Section 5.1.1	This section of the LTR states, "Any exceptions to the SPM would be documented in the WF3 CPCS Software Development Plan (Reference 25). The Software Development Plan also includes clarifications to particular items to make clear how certain aspects of the SPM are being fulfilled." For the ARP, ISG-06, Rev 2 provides guidance on what should be submitted. This includes a summary of the application software planning and processes. The LTR does not provide sufficient information to summarize the differences between the SPM and the WF3 CPCS Software Development Plan in accordance with the guidance of ISG-06, Rev. 2. Please summarize the differences between the SPM and the WF3 CPCS Software Development Plan.	Entergy Update 11/3/20 The LTR will be revised to include the following: The WF3 CPCS Software Development Plan (WNA-PD-00594-CWTR3) documents the following alternatives to the Common Q SPM (WCAP-16096-P-A): Section 5.6.1 of the SPM states: " 1. IV&V phase summary reports: These reports are issued after each life cycle phase of the IV&V task to summarize the IV&V review. Phase summary reports may be consolidated into a single report if desired. These reports shall contain the following: a. Description of IV&V tasks performed b. Summary of task results c. Summary of discrepancies and their resolution d. Assessment of software quality e. Recommendations" Alternative: The IV&V activities will be performed at their respective phases per the Software V&V Plan (SVVP); however, the IV&V team will not issue phase summary reports after each life cycle phase. The results of individual tasks are documented, and anomalies are reported in the RITS system for their resolution. A final IV&V report will be issued encompassing all software development phases. Justification: Due to the limited scope of the project, which is based on a previously completed reference design, the Concept, Requirements, Design, and Implementation phases are impacted concurrently and iterated frequently. Therefore, having intermediate summary reports does not produce additional value to the stakeholders than what is already being provided through underlying task reports and RITS. The Phase Summary Report (PSR) is not the only method of gatekeeper for design progression to the next phase. The design can proceed based on the result of the individual tasks. Therefore, the PSR will be produced only once for this project, which will report on all activities, and will serve as the Final IV&V Report. This is an acceptable alternative to SPM Section 5.6.1, since the feedback to design team is provided timely based on formally issued anomalies and other underlying reports. Section 6.3.2 of the SPM states: "Project-specific software goes to the Lead SW engineer for approval/rejection. …the Lead SW engineer determines the feasibility and appropriateness of project-specific software changes. They sign the form for approval / rejection."	Closed	No RAIs

						Alternative: All software modifications shall be documented with a Software Change Request (SCR) via Global Instrumentation and Control Issue Tracking System [RITS]. All functional deviations shall be documented with RITS. Modifications can be initiated because of a change in functional requirements or because of a functional deviation from the intended functional requirements. The RITS system does not include a method for the Lead SW engineer to approve a software change request; therefore, an alternative approach for approval by the Lead SW engineer or subsystem lead will be taken. Justification: RITS that are identified as functional RITS require approval by a software lead and/or subsystem lead for inclusion in a baseline. The initiator of the functional RITS shall: • Require a detailed evaluation of the RITS. • Route the RITS to the software lead or designated subsystem lead for formal approval of the RITS in a baseline through the detailed evaluation.		
8	SDP-02	Common Q Changes (Deanna Zhang Samir Darbali)	LTR	Section 5.1.6	LTR Section 5.1.6 states in part, “Appendix 5 of the Common Q Topical Report (Reference 13) is the output document for the change process described in Reference 12. The document provides a summary of changes and then detailed recording of analysis and/or qualification documents, and a conclusion statement on the status of the change relative to the NRC safety conclusions. Reference 13 can be audited by the NRC staff...” The response to SPM PSAI 6 refers to the Common Q PSAI regarding the record of changes, but it does not address the validity of the previously derived safety conclusions *if changes have been made to the Common Q SPM*. The response to SPM PSAI 1 refers to the WF3 CPCS Software Development Plan and does not identify if there are any exceptions to the SPM (see the previous open item). LTR Section 6.2.2.16 provides a list of the current product revisions used for the WF3 CPCS project. However it does not describe whether the new revisions invalidate any of the safety conclusions in the safety evaluation of the Common Q platform. This section also states that WF3 will review the topical report record of changes document in Reference 13 for adequate qualification documentation that the changes do not invalidate safety conclusions in the safety evaluation of the Common Q platform. It is not clear whether the WF3 review will verify that safety conclusions for the differences will only be on qualification or whether it would include other topics (e.g., software quality, etc.).	The LTR Section 5.1.6 will be revised as follows: “There have been no changes to the SPM since its approval by the NRC. As a result, the Common Q Record of Changes document will not include any assessments of changes to the SPM.”	Closed	No RAIs

9	SDP-04	SW Requirements (Deanna Zhang Samir Darbali)	LTR	Section 5.2.5	This section states in part, "The allocation of CPCS reference design system requirements (Reference 2) to software have already been accomplished as part of the NRC-approved Palo Verde CPCS replacement. The WF3 delta requirement from the reference design are documented in Reference 21. These are allocated to software as described in Section 5, item c and documented in the SRS....Similar to the WF3 system requirements specification, the SRS is independently reviewed, approved and baselined as input to the ongoing life cycle activities. In addition, the RTM is updated showing the tracing of software requirements to the WF3 system requirements specification (Reference 21)." (a) Based on this description, it is not clear whether the RTM only include requirements on the differences between the WF3 CPCS replacement system/corresponding software requirements and the system requirements/corresponding software requirements in Westinghouse Rev 14 baseline of the CPC system requirements specification or whether it includes all CPCS system requirements. (b) Given that (1) the WF3 system requirements specification only includes deltas between the WF3 CPCS project and the referenced System Requirements Specification of the Common Q Core Protection Calculator System (0000-ICE-30158), Revision 14, and (2) the System Requirements Specification of the Common Q Core Protection Calculator System (0000-ICE-30158) version that was reviewed and approved during the referenced Palo Verde CPCS Digital Upgrade LAR is Revision 7, it is unclear what types of regression analysis have been performed between the Revision 7 and Revision 14 of the System Requirements Specification of the Common Q Core Protection Calculator System to use Revision 14 as the new baseline for the WF3 CPCS project? (c) It is also not clear whether Entergy performed appropriate oversight on the activities related to addressing the differences between Revision 7 and Revision 14 of the System Requirements Specification of the Common Q Core Protection Calculator System.	(a) The RTM only includes requirements on the differences between the WF3 CPCS replacement system/corresponding software requirements and the system requirements/corresponding software requirements in the Westinghouse Rev 14 baseline of the CPCS requirements specification. (b) (Entergy 11/3/20 Update) The following summarizes the revisions to 00000-ICE-30158 since Revision 7. Revision 08 This revision was to change the state of the Operating Bypass Contact annunciator outputs as a result of field installation. Some additional typographical errors and inconsistencies were also corrected. Change Summary: Text Main Body Changes 1. Corrected Figure 2.1-1. 2. Section 2.2.1.5.2.2.1: Deleted "or CPP" from the third bullet. 3. Section 2.3.9.6.3: Revised discussion of Operating Bypass relays so that form A contacts are used on all outputs. 4. Table 3.1.1.1.7-1: Deleted CPC Trouble for CEAC processor global memory failure. 5. Section 3.5.3: Revised to define that an availability analysis shall be performed not a reliability analysis. 6. Added requirement for ANSIN45.2.2 Level B storage in new section 3.6. Appendix Changes: None Revision 09 This revision only changed page A121 in the Appendix. The change was to clarify the calculation of the row index. Revision 10 This revision incorporates changes to various display pages based on customer comments. Change Summary: Text Main Body Changes 1. Moved table of Contents prior to the Revision Abstract and increase number of entries. 2. Revision 09 was issued with various bookmarks printed as "Error! Reference source not found". Corrected these or removed the reference (pgs 23, 30, 103, 210). 3. Section 1.4.2: Removed revision level on CEAPD SysRS (Ref. 1.4.2.9) and added footnote. 4. Section 2.1: Reworded last bullet and removed Reference to CEAPD SysRS. 5. Section 2.1.1.4.3.4: Clarified and added reference to CEAPD data	Closed	9(c) Closed by RAI

						link section 6. Section 2.1.2.2.4.1: added CEA positions to items transmitted to CEAPD. 7. Section 2.1.2.2.4.3: Removed reference to CEAPD SysRS. 8. Section 2.2.1.4.4: Added requirement for CEA trip snapshot page with live CEA position data. 9. Section 2.2.1.4.6: added CRC value to Addressable Constants page. 10. Section 2.2.1.4.7: added CRC value to Change Addressable constants page. 11. Section 2.2.1.4.12: added missing colon for "Page 3". 12. Section 2.2.1.4.19: defined CEA inputs to be displayed as SUBGRPx on this page. 13. Section 2.2.1.4.20: Corrected spelling of capability. 14. Section 2.2.1.5.2.1.2: clarified trouble alarm occurs for loss of other display. 15. Section 2.2.1.5.2.2: Added alarm icon label to sentence. 16. Section 2.2.1.5.2.2.1 and 2, added OM and MTP CRCs do not agree to trouble list. 17. Section 2.2.2.4: changed heading text and changed requirements for AI calibration testing for CPC, CPP1, and CPP2 functional tests. 18. Section 2.2.2.4: Removed requirement to enable the Exit Functional test icons only if the associated AI calibration is complete. This section was modified to reflect the as implemented software. 19. Section 2.2.2.4.6: added section to describe functional test interlock requirements. 20. Section 2.3: corrected CEAPD description and removed reference. 21. Section 2.3.4.1.3: added missing period to end of sentence. 22. Section 2.3.4.4.3.2: corrected description since CEAPD does not use trip buffer data. 23. Section 3.1.1.1.6.3.1: added "minimum" to description. 24. Section 3.1.1.1.9.13: removed reference to CEAPD and added reference to applicable sections. 25. Section 3.1.1.1.9.13.1: Clarified data being sent to CEAPD. 26. Section 3.1.1.1.10.3: defined the CEA position data being sent to CEAPD and usage. 27. Section 3.1.1.1.10.8: added CEA positions to CEAPD cross channel comparison information. Appendix Changes: 1. Corrected Table of contents to remove "symbol" link after Sec. 3.2.5.6. 2. Pg 116: Added IRPC decision statement to reflect text description. 3. Pg 217: Added definition of CEAIW. 4. Pg 217, 219: Moved all variable definitions to end of section 3.2.6.1.1 5. Pg 220: Clarified that CPOS(i,1) is the CEA position of the current execution cycle. Revision 11 Change Summary:		

						Text Main Body Changes 1. Pg 59 clarified the conditions for taking the CEAC snapshot. 2. This revision incorporated changes to the Reactor Power Cutback detection algorithm in Appendix A. Revision 12 Change Summary: Appendix Changes 1. Pg A224, added footnote for starting the RPC timer. Revision 13 Change Summary: Text Main Body Changes 1. Page 150, incorporated CAPs Commitment 07-285-W006.02 for both CEACs inoperable. Revision 14 Change Summary: Text Main Body Changes 1. Re-numbered Sections to match Table of Contents per CAPAL 100074239. Appendix Changes: 1. Correct QHOT definition in Sections 3.2.4.5 & 3.2.4.16 of Appendix A per CAPS #08-315-W001. 11/16/20 Update: Entergy did not perform a regression analysis between the 00000-ICE 30158 Revision 7 and 00000-ICE 30158 Revision 14 documents. Entergy performed a lower level regression analysis audit of the Palo Verde CPCS software changes between the initial release of the software that was approved by the NRC and the current baseline of the Palo Verde CPCS software. This VOP audit included all software change requests for the Palo Verde CPCS software. These software changes in some cases required a revision to the 00000-ICE 30158. This regression analysis audit is documented in an Entergy regression analysis audit report (AUD-WF3-2019-236-CA058). There were no hardware design changes to the CPCS since NRC approval. (c) Reference SA-01a and SA-01b 00000-ICE-30158, Rev 14, System Requirements Specification for the Common Q Core Protection Calculator System, is the basis document for WNA-DS-04517-CWTR3, System Requirements Specification for the Core Protection Calculator System. WNA-DS-04517-CWTR3 is the WF3 delta document for WF3. Requirements traceability is to WNA-DS-04517-CWTR3. When WNA-DS-04517-CWTR3, Rev 0, was reviewed and approved for owners acceptance per procedure EN-DC-149, the applicable sections of 00000-ICE-30158, Rev 14, were reviewed. Based on the regression analysis for		

						n-th of kind systems described in WCAP-16096-P, “Software Program Manual for Common Q Systems," the only requirements traceability will be for the modified sections provided in WNA-DS-04517-CWTR3. There is a VOP audit action to compare the non-modified sections of 00000-ICE-30158, Rev 14, to the Requirements Traceability as part of the Requirements Traceability Matrix (RTM) VOP Audit. A regression analysis of the software is at a lower level of review than doing a regression analysis of the System Requirements Specification, and WF3 considered this review to be of greater value that a document review since this include the complete implementation of any changes. WF3 performed a regression analysis VOP audit of the current Palo Verde code (release 6.7), which was the base line for the WF3 project, to the Palo Verde initial code (release 5.0) to confirm the SPM was followed for design quality, requirements traceability, and IV&V including testing. 00000-ICE-30158, Rev 7 to Rev 13 were not specifically reviewed or audited, since these were not credited for any vendor oversight activity or project activity. The VOP audit of the regression analysis of the software was considered by WF3 to be the best method to access the difference from the Palo Verde software to be used as the baseline for the WF3 software		
10	SDP-03	SW Design (Deanna Zhang Samir Darbali)	LTR	Section 5.2.8	This section states in part, “System Validation Test – this is formal integration testing of the software and hardware performed by the independent test team. The System Validation Test traces the test cases to the WF3 CPCS replacement system requirements specification (Reference 21).” Please explain whether the system validation test only includes test cases for the WF3 CPCS replacement system requirements specification or if it also includes the CPCS reference system requirements specification (Rev. 14).	The intention is to re-run the complete set of PVNGS system tests with the design changes made for the WF3 implementation. Therefore, no credit is being taken for past system tests.	Closed	RAI VOP
11	VOP-01	Critical Characteristics (Deanna Zhang Samir Darbali)	VOP Summary	Table of Contents	It appears that the VOP does not have complete identification of activities for providing oversight of the project and will only be a plan to develop or determine them while the expectation is to have the activities and associated acceptance criteria completed. Examples include: a. Section 6: Development and Assessment of Potential Project and Technical Risk Factors b. Section 7: Determine Performance Measures and Acceptance Criteria (Critical Characteristics/Design Artifacts) (a) It is also not clear what oversight activities are associated with Section 7 of the VOP to verify the vendor has satisfied the critical characteristics. (b) Section 2 of the VOP Summary states in part “The level of vendor oversight follows a graded approach, based on project and technical risk factors, which are described in VOP Section 6. All levels of the graded approach will include specifically defined performance measures and acceptance criteria which are described in VOP Section 7.” Based on this description, the project and technical risk factors and the performance	(a) Per VOP Section 7, "The scope of vendor oversight is expected to evolve during the project. Project-specific performance measures that warrant vendor oversight are updated as this list changes." The performance measures are divided into three categories: • Critical Characteristics, • Design Artifacts, and • Programmatic Elements. As listed in VOP Section 7, the following activities are used to provide oversight of the each category: Critical Characteristics: " Oversight of critical characteristics utilizes the following vendor oversight activities: • Conducting vendor audits and quality surveillances	Closed	Audited

					measures and acceptance criteria for the critical characteristics and programmatic elements should already have been identified in the VOP. This does not appear to be consistent with the titles of Sections 6 and 7. (c) It is also not clear based on the title of Section 8 in the Table of Contents for the VOP, what "Implement Appropriate Oversight Methods" will entail.	• Reviewing WEC design output documents • Participating in Factory Acceptance Testing • Conducting Site Acceptance Testing • Conducting Post-Modification Testing • Observing or witnessing specific vendor activities • Capturing issues in WF3/WEC corrective action programs" Design Artifacts: "Oversight of the design artifacts utilizes the following vendor oversight activities: • Conducting vendor audits • Reviewing WEC design output documents (e.g., specifications, drawings, analyses) • Providing input to and review/confirmation of specific vendor activities and related information items • Coordinating multi-disciplined interactions between various stakeholders • Capturing issues in WF3/WEC corrective action programs" Programmatic Elements: "Conducting vendor audits • Reviewing WEC design output documents • Providing input to and review/confirmation of specific vendor activities and related information items • Observing or witnessing specific vendor activities • Participating directly in specific vendor activities • Coordinating multi-disciplined interactions between various stakeholders • Capturing issues in WF3/WEC corrective action programs" (b) The acceptance criteria and oversight activities have been identified in VOP Sections 6 and 7. The VOP is a plan and can be revised pending the design/project evolution. As the design/project progresses, it may be necessary to add more acceptance criteria or design artifacts to conduct adequate vendor oversight. (c) Section 8 is intended to show escalation of oversight methods based on the risk factors. If the risk factors which are periodically evaluated indicate that risks are increasing, then supplemental oversight methods may need to be used.		
12	VOP-02	CPP (Deanna Zhang Samir Darbali)	VOP Summary	Section 2	This section of the VOP Summary, states in part, "Monitoring, verification and acceptance phase activities are defined in the Critical Procurement Plan (CPP) during the Planning Phase. Verification can be either through the normal Receipt Inspection process or other activities outlined in the CPP. The Critical Procurement Plan provides a summary of the requirements and necessary actions including on-site services (when required), to ensure that a critical procurement will meet Entergy's expectations...The CPP credits the management of procurement risks based on the Westinghouse software	As indicated in VOP Section 2, Vendor Oversight Plan (VOP) Scope, "The CPCS Replacement Project Critical Procurement Plan (CPP) (Reference 6), prepared under Entergy procedure EN-MP-100, Critical Procurements (Reference 13), is incorporated by reference into the VOP."	Closed	Audited

					verification and validation process, factory acceptance testing, performance of site acceptance testing, and rigorous software testing. QA surveillances will be performed to ensure the approved Westinghouse processes were followed." Given that the VOP summary states that the CPP will be an input to the VOP, what is the relationship between the CPP and the VOP (e.g., the CPP will be referenced in the VOP or parts of the CPP will be incorporated into the VOP)?			
13	VOP-03	Oversight of SPM project-specific instances (Deanna Zhang Samir Darbali)	VOP Summary	Section 3	This section of the VOP Summary, states in part, "Some of the SPM plans will have project-specific instances (i.e., SVVP, SCMP, and Software Test Plan). These project-specific plans will be evaluated to ensure they are developed in accordance with the SPM." Please explain what specific activities will be performed by Entergy to review these plans and what the acceptance criteria are.	Vendor Oversight Plan Revision 2 was uploaded to Item A-01c for reference. VOP section 7 provides some details on how Entergy will review plans and what acceptance criteria will be used. Specifically, subsection Software Verification and Validation describes acceptance criteria for software V&V detail. The VOP Plan includes the use of other Entergy processes and procedures.	Closed	Audited
14	VOP-04	V&V (Deanna Zhang Samir Darbali)	VOP Summary	Section 3	This section of the VOP Summary states that reviews will be performed of V&V for each applicable lifecycle phase for each plan through test. a. Please explain what these reviews will entail. For example, will all lifecycle phase design outputs be reviewed and will the review only cover the WF3 project specific application without including the baseline (e.g., Rev. 14 of the System Requirements Specification of the Common Q Core Protection Calculator System (0000-ICE-30158))? b. Will Entergy audit the design change packages performed between the previous versions of the System Requirements Specification of the Common Q Core Protection Calculator System (up to Revision 7) and corresponding design and implementation documentation between those versions?	a. VOP Revision 2 was uploaded to item A-01c for reference. Section 2 discusses the overall review process, including the relationship to risk ranking and how items are reviewed. Section 7 (specifically Design Artifacts and Programmatic Elements subsections) discusses the reviews throughout the life cycle development. In summary, the VOP, when executed by WF3, does ensure that Westinghouse executes the CPCS system and software lifecycle development consistent with the LAR. The execution of the VOP includes other processes, and procedure EN-DC-149 is used for owner acceptance of design artifacts. EN-DC-149 Rev 15 "Acceptance of Vendor Documents" attached in IMS b. This question is similar to the question asked in item SA-01b and SDP-04c. These responses to those items describe how the SyRS was reviewed and how previous revisions were handled. Additionally, there was discussion on this topic during the VOP audit meeting on 11/19/2020	Closed	Audit
15	VOP-05	Vendor oversight activities (Deanna Zhang Samir Darbali)	VOP Summary	Section 3	This section lists a number of vendor oversight activities that will be applied to the programmatic elements. Please explain how the vendor oversight activities correspond to specific programmatic elements.	VOP Revision 2 has been attached to item A-01c for reference. Section 7 (specifically, Programmatic Elements and Quality Assurance subsections) discuss in detail how vendor oversight activities correspond to specific programmatic elements.	Closed	Audited
16	VOP-06	Criterion VII of Appendix B to 10 CFR Part 50 (Deanna Zhang Samir Darbali)	VOP Summary	All, Section 8	The VOP Summary does not address Appendix B, Criterion VII, "Control of Purchased Items and Services" and the VOP Summary language is inconsistent with Criterion VII. Please explain: a. whether the surveillances planned are consistent with source verification. Source verification needs to be performed at intervals consistent with the importance and complexity of the item or service,	a. VOP Audits and WF3 Quality Assurance (QA) surveillances (EN-QV-108, QA Surveillance Process) are used in conjunction with the CPCS Replacement Project Critical Procurement Plan (CPP), CPP-WF3-2019-002, to provide adequate vendor oversight as defined in the Vendor Oversight Plan.	Closed	Audit

					and shall include monitoring, witnessing, or observing selected activities. b. how the VOP addresses "Control of Suppliers Nonconformances" including evaluation of nonconforming items, review of nonconformances to procurement requirements or purchaser-approved documents (e.g., technical or material requirement violated, requirement in supplier documents, which has been approved by the Purchaser, is violated, purchaser disposition of supplier recommendation, verification of the implementation of the disposition). c. how "supplier evaluation and selection, acceptance of items or services, supplier non conformances, including their evaluation and disposition" will be documented. Section 8 of the VOP Summary, "Documentation," is not clear on this.	Per EN-QV-108, a surveillance is "a process of reviewing or observing an activity, process, or end product to verify that certain actions have been or are being accomplished to obtain desired results. This includes the terms "Monitoring", "Observations", "Walk-downs", "Site Vendor Audit", and "Source Verification." A surveillance activity is normally documented as a surveillance report." In addition, "Surveillances may not be used in lieu of a required audit." b. The VOP incorporates the Critical Procurement Plan (CPP-WF3-2019-002) and specific existing Entergy QA procedures by reference, including EN-QV-108 (QA Surveillance Process). The CPP ensures adequate and timely Supplier QA involvement. Additionally, Work Tracking items (within Entergy's PCRS program) track development of QA surveillances. Procedure EN-LI-102 controls the Entergy Corrective Action Program. c. As discussed in VOP-06b, the Critical Procurement Plan (CPP) is incorporated by reference in the Vendor Oversight Plan (VOP). The CPP provides details Entergy's Supplier QA involvement. Additionally, within the CPP, an evaluation template is used to evaluate the different categories in the project to discrete criteria. If that criteria is not currently available, a tracking action is created to ensure the criteria is evaluated and accepted. The CPP is controlled by Entergy procedure EN-MP-100.		
17	RT-01	Response Time (Summer Sun, Samir Darbali)	LTR 3.2.6		<u>Effect of the CPC Response Time on Thermal Margin Degradation</u> Section 3.2.6 of Attachment 4 in the LAR describes the estimated impact of the CPCS delay time on thermal margin degradation. It indicates that the basis of the estimate is the CEA rod drop time LAR submitted in 2015 that increased the CEA rod drop time in the safety analysis an additional 200 ms due to a hold coil delay that needed to be accounted for. The method used for the CPCS delay time estimate on thermal margin results is to take the thermal margin degradation of the CEA rod drop 200 ms delay and then extrapolate for the increase in CPCS response times. (1) Discuss acceptability of the extrapolation method used to estimate the effect of the CPCS delay time on thermal margin degradation. (2) Identify and justify the values of the CPCS delay times used in the thermal margin estimate for each of the applicable transients and accidents listed in Table 3.2.6-1 of Attachment 4. (3) Discuss what will be done to assure that the values of the CPCS delay time used in the thermal margin estimate are the limiting values applicable to Waterford 3 when the CPCS is installed for operation. (4) Discuss and justify what will be done to assure that the thermal margin estimate for the pre-installed CPCS condition is acceptable, if the values of the CPCS delay time used in thermal margin estimate are not limiting values. 10/15/2020 Update: (1.1) Follow-up question to OI 17(1): The last paragraph of the response states that "In addition, the reload analyses will incorporate the new CPC response times …"	(1) Waterford 3 letters W3F1-2015-0040 [Reference 1] and W3F1-2015-0061 [Reference 2] submitted a control element assembly drop time increase request to the NRC. This request was approved under Waterford 3 license amendment 246 [Reference 3]. Letter W3F1-2015-0061 provided the limiting events results with a control element assembly drop time increase of 200 milliseconds. The W3F1-2015-0040 and W3F1-2015-0061 results can be used to extrapolate the new CPC time impacts on the analysis results. The letter W3F1-2015-0061 showed small changes for the 200 milliseconds and within the acceptance limits. It is reasonable to use the same extrapolation to judge that the analysis results will remain within the acceptance limits (i.e., the largest delay is 53.5 msec). In addition, the reload analyses will incorporate the new CPC response times to ensure the accident analyses thermal margin requirements cover any analysis impacts. References 1. W3F1-2015-0040, License Amendment Request to Revise Control Element Assembly Drop Times, July 2, 2015 [ADAMS Accession Number ML15197A106]. 2. W3F1-2015-0061, Supplement to Revise Control Element Assembly Drop Times Associated with Technical Specification 3.1.3.4, August 13, 2015 [ADAMS Accession Number ML15226A346]. 3. NRC License Amendment 246, Control Element Assembly Drop Times, November 13, 2015 [ADAMS Accession Number ML15289A143].	Closed	RAIs (17.1, 17.1.1, 17.2, 17.3, 17.3.1, 17.4)

					Please clarify the methods that will be used for performing the reload analysis. (3.1) Follow-up question to OI 17(3): The first sentence of the response states that "The response times calculated in WNA-CN-00572-CWTR3 for the CPCS are bounded by the current response time requirements specified in the reference design (00000-ICE-30158). Please clarify the adequacy of the response time requirements specified in the reference design in terms of the thermal limits (i.e., DNBR and LHGR) calculation.	(1.1) The actual WF3 CPCS calculated response times will be used as input for the reload analysis. (2) The identification and justification for the CPCS delay time values in the thermal margin estimate for each applicable transient and accident listed in Table 3.2.6-1 is documented in Westinghouse document LTR-GIC-20-003, "Waterford 3 CPCS Response Time Information for FSAR and Technical Specification." A 2nd document, WNA-CN-00572-CWTR3, "Core Protection Calculator System Response Time Calculation" provides the response time calculation for the WF3 CPCS. Both of these can be submitted to the NRC. WNA-CN-00572-CWTR3, "Core Protection Calculator System Response Time Calculation" was attached to the LAR. LTR-GIC-20-003, "Waterford 3 CPCS Response Time Information for FSAR and Technical Specification" is on the Westinghouse document portal. See OI 26 (h) (3) The response times calculated in WNA-CN-00572-CWTR3 for the CPCS are bounded by the current response time requirements specified in the reference design (00000-ICE-30158). The response time testing conducted during FAT and post installation testing will confirm that the system meets these response time criteria. (3.1) It is LTR-GIC-20-003 that correlates the response time calculated in WNA-CN-00572-CWTR3 to the various CPCS trips. LTR-GIC-20-003 describes the adequacy of the new response time requirements. After further investigation, it was determined that the revised calculated response times are not bounded by the reference design, and the WF 3 SyRS, WNA-DS-04517-CWTR3, needs to specify these new response time requirements. A Westinghouse Corrective Action Issue Report (IR-2020-11971) was issued accordingly. A new revision 5 of WNA-DS-04517-CWTR3 with the new response time requirements is now issued. The Licensing Technical Report is not impacted by this revision because the LTR only referred to the Palo Verde response times and stating that WF3 specific response times would be calculated. Resolution. WNA-DS-04517-CWTR3, Revision 5 will be docketed by 12/31/2020. (4) LTR Section 3.2.6 states, "As part of the normal fuel reload process, Waterford runs the safety analysis of record with the WF3 CPCS calculated response times to validate that acceptable margin is maintained. It is the fuel reload process performed under 10 CFR 50.59 that evaluates the results of the rerun of the safety analysis prior to core reload." If the results become more limiting, the analyses results will be evaluated against the 10CFR50.59 criteria. If the 10CFR50.59 criteria requires NRC approval, then a new submittal will be generated. Based upon previous analysis impacts, it is expected		

						that the response time changes will be covered in the reload under 50.59. In addition, Waterford 3 letter W3F1-2015-0062 [Reference 1] NRC request for additional information question #8 describes the Westinghouse reload process. Reference 1. W3F1-2015-0062, Control Element Assembly Drop Times Submittal Request for Additional Information, September 23, 2015 [ADAMS Accession Number ML15268A019].		
18	CCF-01	CCF (Summer Sun, Samir Darbali, Richard Stattel, Jack Zhao)	LTR 3.2.18		<u>Common Cause Failure Analysis (updated 10/05/2020)</u> Section 3.2.18 of Attachment 4 in the LAR discusses the common cause failure (CCF) analysis and indicates that the original licensing basis for WF3 assumes a potential CCF of the CPCS and that the replacements of the current digital CPCS with the Common Q platform does not change the WF3 licensing basis for defense in depth and diversity (D3) (see LTR page 3-60). In support of the D3 CCF analysis for WF3 CPC updates, the licensee quoted the NRC safety evaluation (SE) approving the CCF analysis for the Arkansas Nuclear One, Unit 2 ANO-2 original CPC design and Palo Verde Nuclear Generating Station (PVNGS) CPC replacements (see LTR pages 3-61 and 3-62). LAR Section 2. "Licensing Technical Report (LTR)," paragraphs 3 – 8 credit the WF3 Anticipated Transients Without Scram (ATWS) Mitigation Systems described in FSAR Chapter 7.8. These paragraphs were added after the draft LAR review pre-application meeting discussions regarding LTR Section 3.2.18. (a) Please explain if the intent of the new paragraphs in LAR Section 2 is to credit the WF3 ATWS instead of the ANO-2 and PVNGS SEs (LTR pages 3-61 and 3-62). In a public meeting held September 22, 2020, the licensee discussed open item 18, Common Cause Failure Analysis, and indicated that it would rely on the information related to the ATWS mitigation systems in FSAR Section 7.8 to address the open item 18 for the CCF analysis. (b) Since the licensee is crediting ATWS, please describe how the ATWS analysis is sufficient to address a CCF failure of the replacement CPCS for the events which credit the CPCS. (c) Please discuss the current technical and licensing basis for the current digital CPCS and whether the Common Q platform maintains this technical and licensing basis for defense in depth and diversity (D3). (d) Please address inconsistencies in the LAR and Section 3.2.18 of the LAR Attachment 4 to reflect the information used for supporting the D3 discussion related to CCF of the CPCS.	(a) The intent of the new paragraphs in Enclosure to Entergy letter number W3F1-2020-0038, dated July 23, 2020, Section 3, "Technical Evaluation," sub-section 2, "Licensing Technical Report (LTR)" is to credit the WF3 ATWS instead of the ANO-2 and PVNGS SEs described in Attachment 4 of the Enclosure to Entergy letter number W3F1-2020-0038 (WCAP-18484-P, "Licensing Technical Report for the Waterford Steam Electric Station Unit 3 Common Q Core Protection Calculator System"). The W3F1-2020-0038 Enclosure Section 3, "Technical Evaluation," sub-section 2, provides the justification of the acceptability of crediting ATWS for CPCS failure to trip due to a CCF. (b) Background. 1. The of the ANO-2 CPCS to perform its normal function was considered by the NRC and documented in NUREG 0308 Supplement 1, "Safety Evaluation Report related to the operation of Arkansas Nuclear One, Unit 2," dated June 1978. Supplement No. 1 to Appendix D of the Safety Evaluation Report documents the basis for the NRC's approval. In summary, analog backup trips exist for five (5) of the six (6) credited events, as well as 5 other events. The CEA misoperation event does not have a backup analog reactor trip. Automatic reactor trips have not been provided in previous Combustion Engineering protection system designs for this event. In the unlikely event that a CEA deviation event, which required a reactor trip, occurred without a CPC trip, the operator would get alarms from COLSS on CEA position and flux tilt similar to the non-CPCS plants. Operators could then initiate a manual trip. The conclusion documented in Appendix D of Supplement 1, Section D.2 is that the backups to the CPCS failure to trip at ANO-2 are acceptable. 2. In NUREG 787, "Safety Evaluation Report related to the operation of Waterford Steam Electric Station, Unit No. 3," dated July 1981, Section 7.2.3, the NRC wrote: "The CPCs were not reviewed, per se, at Waterford 3. The staff has taken the operating experience of ANO-2, the previous review, and acceptance of the ANO-2 CPCs, and the similarity of the Waterford 3 and ANO-2 CPCs, into account in reaching this decision."	Closed	No RAIs

					10/28/2020 Update: (d.1) The second paragraph in LAR Section 3, sub-section 2, “Licensing Technical Report (LTR),” refers to LTR Section 3.2.18 and the ANO-2 and PVNGS evaluations. Please explain if this paragraph will also be revised. 11/10/2020 Update: (c.1) The response to item (c) suggests that conformance with BTP 7-19 is not required. However, LAR Section 4.1 “Applicable Regulatory Requirements/Criteria” lists BTP 7-19. LTR Section 3.2.18 also identifies BTP 7-19. Please clarify if the LAR and LTR will be revised to remove references to BTP 7-19?	3. In NUREG 0787 Supplement 5, Section 4.4.2 dated June 1983, the NRC indicated that the CPCS/CEACs are essentially the same as the ANO-2 Cycle-2 CPCs and since the ANO-2 CPC/CEAC were approved by the NRC staff (July 21, 1981 Memorandum), the review of the Waterford 3 CPC/CEAC concentrated on the software modifications and its implementation. Because there is no additional documentation in any of the subsequent supplements, the implicit conclusion is that the acceptability of the CPCs failing to meet design function at ANO-2 also applies to Waterford 3. 4. FSAR Section 7.2.1 describes the Reactor Protection System (RPS). FSAR Section 7.2.1.1.8 describes how the system is designed to eliminate credible multiple channel failures originating from a common cause. This section applies to all of the RPS, which includes CPCs. This section is unchanged since Revision 0 of the FSAR (circa 1985) Discussion The CPC digital upgrade project does not alter how the diversity within the RPS is achieved, as described in the FSAR 7.2.1.1.8. However, industry and regulatory developments over the past 35 years have provided further improvements to address reactor protection systems common cause failures. The most noteworthy is the Anticipated Transient Without Scram (ATWS) rule (i.e., 10 CFR 50.62). Implementation of the ATWS Mitigation System is described in FSAR section 7.8. The system is designed to mitigate the consequences of Anticipated Operational Occurrences (AOO’s) coupled with a failure of the RPS to trip the reactor. The Diverse Reactor Trip System (DRTS) provides an independent means of sensing a high pressurizer pressure and then de-energizing the MG set output contactor coils that provide the power to the Control Element Drive Mechanisms, and subsequently trip the reactor. The NRC provided the acceptance for the Waterford 3 ATWS mitigating systems design in the Safety Evaluation dated September 8, 1989 (ML8909180108). The NRC inspection of Compliance with the 10 CFR 50.62 (ATWS Rule) is documented in Inspection Report 89-39 dated December 5, 1989 (ML8912110063). There were no violations or deviations noted in the report concerning the implementation of the ATWS system at Waterford 3. The ATWS system at Waterford 3 is a more rigorous backup to a postulated common cause failure of the CPCS relative to reliance on the NRC's evaluation of a similar system at ANO-2. The ATWS system at Waterford 3 is plant specific, incorporated in the design basis, and is continually evaluated as the overall plant design evolves. Both the extended power uprate and replacement steam generator projects resulted in evaluations of the ATWS mitigating systems to ensure the major plant changes did not negatively impact the ATWS systems (SGT-LTR-TDA-09-20, “Evaluation of Anticipated Transients Without Scram (ATWS) Rule Compliance for Waterford 3 with RSGs and a Full Core of NGF Fuel”		

						Conclusion The function of the CPCS to calculate and provide LPD and DNBR trip signals to the RPS to prevent fuel damage during AOOs is unchanged. The features of the RPS which provide analog trips as a backup to failure of the CPCS to cause trips is unchanged as a result of the CPCS digital upgrade project. However, since initial startup of Waterford 3, the implementation of the ATWS rule provides complete protection of the fuel for AOOs that should result in the RPS tripping the reactor. The ATWS systems are independent from the RPS, have been inspected by the NRC and continually evaluated for impacts as the plant design evolves. (c) Entergy Update 11/3/20 The technical and licensing basis for the existing CPCS are the following sections of the WF3 UFSAR: • Chapter 7.2 (Since the CPCS is an integral part of the Reactor Protective System, the CPCS basis is described throughout the section. Note Section 7.2.1.1.8 establishes the licensing basis for diversity against “a predictable common failure mode”) • Appendix 4.3A.5.2 & 4.3A.5.3 To summarize what is described in UFSAR Chapter 7.2.1.1.2.5, the basic architecture for the CPCS is a four channel computer system (i.e., Core Protection Calculator [CPC]) that calculates these parameters and initiates reactor trip signals to the analog reactor protection system. This basic architecture also includes two computers (CEAC 1 and CEAC 2) that calculate a CEA position penalty factor used by all four CPC computers. The WF3 I&C architecture mirrors the echelons of defense described in NUREG 6303, “Method for Performing Diversity and Defense-in-Depth Analyses of Reactor Protection Systems,” to protect the health and safety of the public. The first echelon is the non-safety control systems which controls the nuclear plant process within its technical specification limits. The second echelon of defense is the plant protection system to automatically shutdown reactivity and provide heat removal in case of an accident. And the third echelon of defense is the manual indications and controls to allow operators to manually control the plant. In addition to these echelons of defense, there is an ATWS system to protect the health and safety of the public should an anticipated transient occur without a scram. This plant modification only impacts the second echelon of defense, the plant protection system, and in particular the reactor protection system. The WF3 operating license allows for a computerized digital system to calculate and initiate a reactor trip on low DNBR and High LPD in support of the WF3 accident analysis, as described in the WF3 UFSAR Chapter 7.2.1.1.2.5. As summarized above and		

						described in detail in WF3 UFSAR Chapter 7.2.1.1.2.5, the basic architecture for this aspect of the reactor protection system is a four channel computer system (i.e., CPC) that calculates these parameters and initiates reactor trip signals to the analog reactor protection system. This basic architecture also includes two computers (CEAC 1 and CEAC 2) that calculate a CEA position penalty factor used by all four CPC computers. This plant modification does not invalidate the diversity claims in UFSAR Section 7.2.1.1.8. The Common Q CPCS upgrade preserves this basic architecture but improves upon it by multiplying the number of CEAC computers from two to eight (2 in each channel) to improve system reliability. There are still four independent CPC channels calculating DNBR and LPD as in the existing architecture. Therefore the D3 strategy for WF3 is not impacted by this plant modification. There are no plans at this time to replace any of the non-safety plant control systems with the Common Q platform which could potentially impact the WF3 D3 strategy. Should the PPS be replaced with a digital system, then compliance to BTP 7-19 would be required. (d) Attachment 4 of the Enclosure to Entergy letter number W3F1-2020-0038 (WCAP-18484-P, “Licensing Technical Report for the Waterford Steam Electric Station Unit 3 Common Q Core Protection Calculator System"), Section 3.2.18 will be revised to delete reference to the ANO-2 diversity analysis and refer to the LAR for the D3 assessment for the Common Q CPCS. (d.1) Yes, LAR Enclosure Section 3.2, Licensing Technical Report (LTR) will be revised as part of a LAR Supplement. The following paragraph will be deleted: "LTR Section 3.2.18 describes the NRC evaluation of the first CPCS at Arkansas Nuclear One, Unit 2 (ANO-2) in NUREG-0308, "Safety Evaluation Report Related to the Operation of Arkansas Nuclear One, Unit 2," Supplement 1 (i.e., the ANO-2 NRC SER) in regards to CPCS Common Cause Failure (CCF). This was also the evaluation the NRC staff referred to in their PVNGS safety evaluation for the Common Q CPCS upgrade license amendment (Reference 6.10, Section 3.4.6.11). The NRC cited the ANO-2 evaluation to conclude, in part, that CCF is adequately addressed for the Common Q CPCS replacement for PVNGS. The Waterford LTR included this as part of the reference design licensing precedence." (c.1) In LAR Section 4.1, "Applicable Regulatory Requirements/Criteria", under the bullet, "The applicable portions of the following branch technical positions within NUREG-0800, Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition" (SRP), Chapter 7, "Instrumentation and Controls," as follows:"; the sub-bullet "Branch		

						Technical Position 7-19, "Guidance for Evaluation of Diversity and Defense-In- Depth in Digital Computer-Based Instrumentation and Control Systems", will be removed. In regards to the LTR, Section 3.2.18, "Common Cause Failure (CCF)", the 1st paragraph in that section will be deleted removing the citation to BTP 7-19.		
19	TS-01	Clean TS pages (Tarico Sweat, Audrey Klett, Samir Darbali)	Encl, Att 2	Cover page	<u>Clean TS Pages</u> Attachment 2 cover page lists 3/4 2-6a as a clean TS page; however, the mark-up and submitted clean page is numbered 3/4 2-6, not 3/4 2-6a. Confirm that this was a typo and that the Attachment 2 list entry should be 3/4 2-6 and not 3/4 2-6a. <u>11/20/20 Update</u>: PROPOSED DRAFT RCI: The cover page for Attachment 2 lists 3/4 2-6a as a clean TS page; however, the mark-up and submitted clean page is numbered 3/4 2-6, not 3/4 2-6a. The NRC staff requests the licensee to confirm that the page number (3/4 2-6a) listed in the Attachment 2 cover page was a typographical error and that page 3/4 2-6 is the correct page number.	The information on the coversheet of Attachment is incorrect. The Markup page is correct. There is no intention to submit a corrected coversheet.	Closed to RCI	RCI
20	TS-02	Marked up and Clean TS pages (Tarico Sweat, Audrey Klett, Samir Darbali)	Encl, Att 1 Encl, Att 2	Cover pages	<u>Marked up and Clean TS Pages</u> The cover page of Attachment 1 lists page 3/4 10-2 as having mark-ups; however, the marked up version of this page is not provided in the LAR. The cover page of Attachment 2 lists page 3/4 10-2, however, a clean version of this page is not included in Attachment 2 (assuming that the licensee intended to provide a mark-up of page 3/4 10-2). NRC staff requests the licensee to confirm whether it intended to propose changes to this TS page and, if so, to provide the proposed marked up and clean TS pages. <u>11/20/20 Update</u>: PROPOSED DRAFT RAI: The cover page of Attachment 1 lists page 3/4 10-2 as having mark-ups; however, the marked up version of this page is not provided in the LAR. The cover page of Attachment 2 lists page 3/4 10-2, however, a clean version of this page is not included in Attachment 2 (assuming that the licensee intended to provide a mark-up of page 3/4 10-2). The NRC staff requests the licensee to licensee to confirm whether it intended to propose changes to this TS page and, if so, to provide the proposed marked up and clean TS pages, as applicable.	The change to TS 3.10.2 is partially described in the table on page 11 of 27 in the Enclosure to W3F1-2020-0038. The table entry for TS 3.10.2 will be enhanced to indicate that the editorial change for "Functional Unit 15" to "Functional Unit 9c" occurs four times on the page, as shown on the markup. (see below). TS 3.10.2 is being revised in four places to replace "Functional Unit 15" with Functional Unit 9c". This is purely editorial as a result of the changes to TS 2.2.1 and 3.3.1 described above, which redesignated the CPCs as Functional Unit 9c in Tables 2.2-1 and 3.3-1. The Markup and Clean copies were inadvertently absent from the LAR submittal and will be provided along with the revised table entry with the next docketed CPC correspondence. Copies attached to this response.	Closed to RAI	RAI
21	EQ-01	Oversight of EQ (Jack Zhao, Deanna Zhang, Samir Darbali)	VOP Summary		In the earlier pre-submittal meetings, the licensee stated that it would include the equipment qualification (EQ) for some unqualified items as a licensee commitment. But, in the final pre-submittal meeting, the licensee did not include the commitment and stated that EQ would be performed as part of the VOP. The VOP Summary does not describe how the VOP will cover the equipment qualification for the unqualified items. Please clarify which VOP Summary section includes the oversight of EQ.	The VOP Summary (included with the LAR) Section 5.1, Critical Characteristics, includes Environmental Critical Characteristics. In addition, VOP Section 5.2, Design Artifacts, includes review of Westinghouse design documents. This section provides examples of Westinghouse design documents including the System Requirements Specification (SyRS), Software Requirements Specification (SRS), etc. Another example, not listed, includes the Equipment Qualification Summary Report (EQSR).	Closed	Audit the EQ part of the VOP RAI

						Note that VOP Section 7, Determine Performance Measures and Acceptance Criteria, includes oversight of EQ. The Environmental Critical Characteristics section includes acceptance criteria which will be evaluated as part of vendor oversight. In addition, the Design Artifacts section includes a review of the Westinghouse Equipment Qualification Summary Report (EQSR) per Entergy procedure EN-DC-149, Acceptance of Vendor Documents.		
22	EQ-02	GDC 4 (Jack Zhao, Samir Darbali)	LAR Section 4		Please clarify why the applicable GDC 4 was not addressed and evaluated in Section 4 of the LAR.	A LAR Supplement will contain a revision to LAR Section 4, Regulatory Evaluation. This revision will include the following: "10 CFR 50, Appendix A, GDC 4 requires that the core protection calculator system (CPCS) be designed and qualified to operate under the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents, including loss-of-coolant accidents. The protection system shall also be appropriately protected against dynamic effects. The CPCS equipment qualification is contained in the Equipment Qualification Summary Report (EQSR) which is referenced in the LTR (Reference 35)."	Closed (V)	Need to verify the revised LAR or its supplement to close this OI.
23	EQ-03	CPCS components Not Listed in Table 2.1-1 (Jack Zhao, Samir Darbali)	Attachment 11, Section 2.1		In Section 2.1 it says that the CPCS primary digital components identified in Table 2.1-1 are addressed. Please list the components which are not addressed in Attachment 11.	The following components are covered by the subsequent EQSR: **[[** **]]**	Closed	
24	EQ-04	EQ assessments (Jack Zhao, Samir Darbali)	Attachment 11, Section 3		In Section 3 it says that an assessment was performed for seismic, environmental, and EMC qualification in Reference 10 and 11 of Attachment. But, except the conclusion statement in Attachment 11, no summary of these assessments is provided. Please place on the portal either References 10 and 11 or their assessment summaries for the staff's evaluation. (Depending on the information contained in these references, either excerpts or the entire of documents mentioned in the response may need to be docketed.)	References 10 and 11 will are now in the Westinghouse ERR. (PDF files CN-EQT-19-11_Revision_0.pdf and CN-EQT-19-12_Revision_0.pdf are in the Westinghouse ERR under the folder "Open Item 24 (EQ-04)".) UPDATE: References 10 and 11 have since been superseded by CN-EQT-20-2 and CN-EQT-20-5. CN-EQT-19-11 and CN-EQT-19-12 are referenced by CN-EQT-20-2 and CN-EQT-20-5. EQ-QR-412-CWTR3 only references CN-EQT-20-2 and CN-EQT-20-5.	Open	This item can be closed after doc. CN-EQT-20-2 and CN-EQT-20-05 are docketed. These two documents are on the WEC sharepoint, but

						Westinghouse recommends only docketing CN-EQT-20-2 and CN-EQT-20-5.		not seen on NRC RPS.
25	EQ-05	Licensee's EQ Summary Report for CPCS (Jack Zhao, Samir Darbali)	Attachment 11		In Attachment 11, it says a few times that the qualification of all components used in the final CPCS design will be addressed in the CPCS equipment qualification summary report for Waterford Unit 3 and will not be addressed in this report (i.e., Attachment 11). However, according to Section D.3 of ISG-06, which says that "The NRC staff should verify that the licensee has demonstrated that the system will perform its safety functions under the design-basis conditions at the location in which the equipment will be installed. This information should be found in equipment qualification test plans, methodologies, and test reports." (a) Please explain the difference between Attachment 11 ("Qualification Summary Report for Waterford Unit 3") and the "CPCS equipment qualification summary report for Waterford Unit 3" being referred to. (b) Please explain when the licensee's CPCS equipment qualification summary report will be submitted for evaluation. (The EQ Summary report for additional items, EQ-QR-412-CWTR3, Revision 0 mentioned in the response may need to be docketed.)	(a) The LTR, Section 4, states, "Further equipment qualification testing and/or analysis of lower level CPCS equipment such as HSL modems, power supply assembly, interposing relays is required after the detailed hardware design is complete." Attachment 11 summarizes the generic qualification performed on the Common Q platform to demonstrate that the platform can meet site environmental requirements. The subsequent EQSR is to summarize the EQ for the detailed design implementation of the CPCS. (See the response to OI #23) (b) The EQ Summary report referenced in the LTR, EQ-QR-400-CWTR3, Rev 0, "Core Protection Calculator System Primary Digital Components Qualification Summary Report for Waterford Unit 3" was attached to the LAR. The EQ Summary report for additional items, EQ-QR-412-CWTR3, Revision 0, "Core Protection Calculator System Upgrade Project Equipment Qualification Summary Report for Waterford Unit 3" is now available and is in the Westinghouse ERR per request A-01 n. UPDATE: EQ-QR-412-CWTR3, Revision 1 will be docketed by 12/31/2020.	Closed	See OI Item 31 (EQ-06)
26	A-01	Audit Documents Everyone			**Audit Documents #1:** Please have the following information readily available and accessible for the NRC staff's review via an internet-based portal: a. ◯ Licensee documentation of Common Q platform changes assessment activities performed in accordance with PSAI 6.17 response. (See WCAP-18484 LTR Section 6.2.2.16) b. ✔ Common Q Record of Changes document – Updated version of Reference 19 to the Common Q platform safety evaluation, (ADAMS accession No. ML20020A003) (Reference 13 of LAR). c. ✔ The VOP and other documents that are referenced in the VOP that encompass the licensee's plan for performing oversight of the vendor for the development of the CPCS. These documents should demonstrate how the licensee will perform vendor oversight in relation to the following system and lifecycle development activities: o Review of the current Common Q Record of Changes o Verification that Westinghouse complies with the requirements in the SPM for a secure development environment o Equipment Qualification o Verify that Westinghouse properly propagates the response time requirements through the design, implementation, and test of the replacement CPCS d. ✔ Software Development Plan for the Core Protection Calculator System Upgrade, WNA-PD-00594-CWTR3 e. ✔ Configuration Management Plan for the Core Protection Calculator System Upgrade Project, WNA-PC-00069-CWTR3	Comments from the licensee or staff on each portal document. a. b. Provided in the WEC SharePoint c. Waterford 3's Vendor Oversight Plan (VOP-WF3-2019-00236) Revision 2 has been uploaded to this response. Of particular note, VOP section 7 discusses how WF3 will review the Common Q record of changes (Physical Critical Characteristics subsection), how WF3 will verify Westinghouse complies with requirements in the SPM (Design Artifacts and Secure Development Environment subsections), and documents that the response time will be confirmed to meet the SyRS (Performance Critical Characteristics subsection). d. Located in WEC SharePoint e. Located in WEC SharePoint f. See Attachment 1 of the VOP and WEC SharePoint Entergy Uploaded Organization chart to IMS (11/3/20 Update) g. Entergy Uploaded to IMS (11/3/20 Update) h. Provided in response to OI 17.2, WEC Uploaded to SharePoint (11/3/20 Update) i. There is not a WF3 CPC project-specific Software Safety Plan, Section 3, Software Safety Plan, of the Common Q Software Program Manual is followed. WCAP-16096-P R5 is the SPM used for the CPC project. In some cases the SPM requires project-specific plans (e.g., Test Plan, Project Plan). However, there is no requirement for a project-specific Safety Plan, so projects can choose to follow the generic plan	Open	Audit

					f. ✔ Westinghouse organization chart, as referenced in LTR Section 5.2.12, “Software V&V Processes” g. ✔ Control Panel 7 & 2 Cyber Security Door Lock Plan, ENT-WF3-CPC-115 h. ✔ Document that identifies and justifies the values of the CPCS delay times used in the thermal margin estimate for each of the applicable transients and accidents listed in Table 3.2.6-1 of Attachment 4. i. **N/A** Software Safety Plan for the Core Protection Calculator System Upgrade j. ✔ SPEC-10-00001-MULTI, “73.55 Fleet Strategy Implementation – Fiber Optic Cable Common-Procurement Specification” (Reference 40 of the LTR) k. ✔ AC160 CPU Loading Restrictions, Document Number AN03007Sp (SyRS Reference 1.4.2.12) l. ✔ Project Management Plan for the Waterford 3 Core Protection Calculator Upgrade, GPEP-PMP-2019-000020, Revision 1 m. ✔ WF3 Project Quality Plan n. ✔ Subsequent EQSR (see open item 23) o. ✔ Waterford Unit 3 Common Q Implementation – Non-LOCA Evaluation of Updated CPCS Response Times, LTR-TA-20-4, Revision 0 (LTR Reference 24) p. ✔ PO 10587546 - CPC, CEAC, CEAPDS Single Channel and Four Channel Components q. ✔ PO 10591996 – Input / Output (I/O) Simulator Components r. ✔ SPEC-18-00005-W, Rev 0 s. ✔ CPCS Replacement Project Critical Procurement Project (CPP), CPP-WF3-2019-002 (WTWF3-2019-00236) t. ✔ EN-MP-100, Critical Procurements u. ✔ EN-DC-115, Engineering Change Process v. ✔ EN-IT-104, Software Quality Assurance Program w. ✔ 00000-ICE-36369, Rev. 02,” CPC Timing Analysis for the Common Q Core Protection Calculator System x. ✔ EN-DC-149, Acceptance of Vendor Documents y. ✔ Waterford 3 Core Protection Calculator System Safety Function Table, LTR-TA-19-154, Revision 0 z. ✔ Entergy Quality Assurance Program Manual aa. ✔ Entergy Specification SPEC-18-00005-W, Revision 0, “Core Protection Calculator Purchase Specification,” April 2, 2019. bb. ✔ Westinghouse Letter CWTR3-19-21, Revision 2, “Transmittal of Westinghouse Final Compliance Matrix for SPEC-18-00005-W,” June 28, 2019. cc. ✔ Westinghouse Calculation Note CN-EQT-19-6, Revision 0, “Determination of In-Equipment Response Spectra for Waterford Unit 3 Core Protection Calculator System,” August 12, 2019. dd. ✔ Westinghouse Document WCAP-16166-P Supplement 1-E09, Revision 1, “Equipment Qualification Report for AC160 Platform – AI687	in Section 3 of the SPM. So, there is no WF3 CPC project-specific Software Safety Plan, Section 3, Software Safety Plan, of the Common Q Software Program Manual is followed for the project. j. Located in WEC SharePoint k. Provided in the WEC SharePoint l. WEC Uploaded to SharePoint (11/3/20 Update) m. Provided in the WEC SharePoint n. Provided in the WEC SharePoint o. Entergy Uploaded to IMS (11/3/20 Update) p. Entergy Uploaded to IMS (11/3/20 Update) q. Entergy Uploaded to IMS (11/3/20 Update) r. Entergy Uploaded to IMS (11/3/20 Update) s. Entergy Uploaded to IMS (11/3/20 Update) t. Entergy Uploaded to IMS (11/3/20 Update) u. Entergy Uploaded to IMS (11/3/20 Update) v. WEC Uploaded to SharePoint (11/3/20 Update) w. Located in IMS x. Located in WEC SharePoint y. Requested and received during the 11/19/20 VOP Audit z. Located in IMS aa. bb. Located in WEC SharePoint cc. Located in WEC SharePoint dd. Located in WEC SharePoint ee. Located in WEC SharePoint ff. Located in WEC SharePoint gg. Located in WEC SharePoint hh. Located in WEC SharePoint ii. Located in WEC SharePoint jj. Located in WEC SharePoint kk. Located in WEC SharePoint ll. Located in WEC SharePoint mm. Located in WEC SharePoint nn. Located in WEC SharePoint oo. Located in WEC SharePoint pp. qq. Located in WEC SharePoint rr. Located in IMS ss. Located in IMS tt. Located in IMS uu. Located in IMS vv. Located in IMS ww. Located in IMS xx. Located in IMS yy. Located in IMS zz. Located in IMS aaa. ccc.		

					and AI688 Modules and Supporting Components for Use in Common Qualified (Common Q) Post Accident Monitoring System". ee. ✔ Westinghouse Document WCAP-16166-P Supplement 1-E05, Revision 5, "Equipment Qualification Report for AC160 Platform – PC Node Box / Flat Panel Display System Components". ff. ✔ Westinghouse Document 00000-ICE-37778, Revision 0, "Qualification Summary Report for the PVNGS Common Q Based CPCS". gg. ✔ Westinghouse Document 00000-ICE-37764, Revision 4, "Summary Qualification Report of Hardware Testing for Common Q Applications". hh. ✔ Westinghouse Document 00000-ICE-37773, Revision 0, "Supplemental Qualification Test Report for Common Q Applications". ii. ✔ Westinghouse Document CN-EQT-20-7, Revision 0, "Seismic Evaluation of Waterford Unit 3 Auxiliary Protection Cabinet," May 11, 2020. jj. ✔ Westinghouse Document CN-EQT-20-5, Revision 1, "Qualification Evaluation of Core Protection Calculator System Equipment for Waterford Unit 3 Main Control Room," August 27, 2020. kk. ✔ Westinghouse Test Report, EQLR-463, Revision 0, "Electromagnetic Compatibility Report for the Waterford 3 Core Protection Calculator Upgrade Equipment," August 2020. ll. ✔ Westinghouse Document EQLR-470, Revision 0, "Mild Environment Test Report for the Core Protection Calculator System Equipment," September 2020. mm. ✔ Westinghouse Document EQ-TP-496-CWTR3, Revision 0, "Environmental Test Procedure for the Core Protection Calculator System Equipment," June 2020. nn. ✔ Westinghouse Document EQLR-475, Revision 0, "Seismic Qualification Test Report for the Core Protection Calculator System Equipment," September 2020. oo. ✔ Westinghouse Document EQ-TP-499-CWTR3, Revision 0, "Seismic Test Procedure for the Core Protection Calculator System Equipment," July 2020. pp. ✔ CN-EQT-20-2 (see OI#32) qq. ✔ Human Factors Engineering Guideline for the Common Q Display System, WNA-IG-00871-GEN, Westinghouse Electric Company LLC (HFE) rr. ✔ NMM Procedure EN-DC-163, Human Factors Evaluation (HFE) ss. ✔ NMM Procedure EN-TQ-212, Conduct of Training and Qualification (HFE) tt. ✔ NMM Procedure EN-AD-101, NMM Procedure Process (HFE) uu. ✔ NMM Procedure EN-TQ-201, Systematic Approach to Training Process (HFE) vv. ✔ NMM Procedure EN-DC-115, Engineering Change Process (HFE) ww. ✔ LO-HQNLO-2018-00081, CPCS Benchmarking Report (HFE) xx. ✔ LO-HQNLO-2019-00086, CPCS Benchmarking Report (HFE) yy. ✔ NMM Procedure EN-PL-101, Entergy Nuclear Organization and Functional Structure (HFE) zz. ✔ NUREG 0787			

					aaa. ✔ WEC EQLR-483, Revision 0, "Mild Environment Test Report for the Auxiliary Protective Cabinet MUX Assembly," November 2020. bbb. ✔ WEC EQ-TP-508-CWTR3, Revision 0, "Environmental Test Procedure for the Core Protection Calculator MUX Assembly," September 2020. ccc. ✔ LTR Reference 54, WNA-AR-00861-CWTR3, "Software Hazard Analysis for the Core Protection Calculator System Upgrade Project" ddd. LTR Reference 59, CPCS uncertainty calculation for Waterford Unit 3, WNA-CN-00566-CWTR3 eee. WNA-PT-00303-CWTR3, Test Plan for the Common Q Core Protection Calculator System			
27	A-02	Audit Activities Everyone			1. Requirements Traceability Demonstration – show how requirements from the reference CPCS design (Palo Verde) SyRS (00000-ICE-30158) and the WF3-specific "delta" SyRS (WNA-DS-04517-CWTR3 are traced all the way through testing.	(Entergy 12/19/2020) The plan is to re-run the complete set of PVNGS system tests with the design changes made for the WF3 implementation. Therefore, no credit is being taken for past system tests conducted for the Palo Verde CPCS. This would in effect, re-run all the system tests that support the original Palo Verde requirements tracing to system test including the test mentioned in NRC OI 30 (SA-03).	Open until completion of audit	Audit, and RAI
28	A-03	VOP Audit Activities (Deanna Zhang Samir Darbali)			VOP Audit Discussion Requests: 1. Discuss definitions of acronyms such as FME and DWGS. 2. Discuss responsibilities of Entergy CPCS Project Digital or I&C Engineer in Section 5 3. Discuss risks identified in Table 5-1; specifically the risk associated with "Hazards" 4. Walk through of Section 7 and discuss performance measures, acceptance criteria and their relationships to specific oversight activities	(Entergy 11/3/20 Update) 1. The acronym FME is Foreign Material Exclusion. The Critical Procurement Plan describes project considerations in accordance with Waterford's FME program. The acronym DWGS is for drawings.	See VOP Audit Questions Document Open until completion of audit	Audit
29	SA-02	CPU Load Limit (Samir Darbali)	LTR 3.2.7.2.7	3-34, 3-35	[[ ]]	[[ ]] The LTR, Section 3.2.7.2.7 will be updated with the following additional items: [[ ]]	Closed	

						[[ ]]		
30	SA-03	CPU Load Limit / VOP (Samir Darbali, Deanna Zhang)			[[ ]] 12/10/2020 Update: 30.1 Please explain if implementation of all system requirements defined in 00000-ICE-30158 (applicable to Waterford 3 CPCS as identified in WNA-DS-04517-CWTR3) will be ensured via the RTM. [[ ]]	[[ ]] 30.1 00000-ICE-30158, Rev 14, System Requirements Specification for the Common Q Core Protection Calculator System, was reviewed against WNA-DS-04517-CWTR3 “System Requirements Specification for the Core Protection Calculator System”, Revision 5. Any design requirements from 00000-ICE-30158, Rev 14, that were not identified in WNA-DS-04517-CWTR3, Rev 5, will be reviewed against the RTM during the Requirements Phase IV&V VOP Audit, and the Design Phase IV&V VOP Audit. This review will determine if these requirements are included as part of another document, such as WNA-DS-04618-CWTR3, Software Requirements Specification for the Core Protection Calculator System Replacement Project Upgrade, or if a requirement will need to be added to WNA-DS-04517-CWTR3. 30.2 [[ ]]	Closed	Audit RAIs for 30.1, 30.2

						[[ ]]		
31	EQ-06	Two Open Items Unresolved in the New EQ Summary Report (Jack Zhao)	EQ-QR-412-CWTR3, Rev. 0		The new EQ Summary Report, EQ-QR-412-CWTR3, Rev. 0 contains two open items which have not been resolved in the report. What's the schedule to resolve these two open items and then revise this new EQ Summary Report accordingly? 02/26/21 The two open items need to be closed successfully, and then the licensee should submit and docket the revised EQ Summary Report.		Open	RAI is needed if the two open items are not closed before the schedule to issue RAIs.
32	EQ-07	Reference containing the assessment of existing seismic, environmental, and EMC testing (Jack Zhao)	EQ-QR-412-CWTR3, Rev. 0	Section 3.1	In Section 3.1 it says that an assessment was performed for existing seismic, environmental, and EMC testing in Reference 11 (CN-EQT-20-2), but only conclusion statements are included in this new EQ Summary Report without adequate supporting information. (To be added to OI #26: Please place Reference 11 in the portal.)	Westinghouse Document CN-EQT-20-2, Revision 2, "Qualification Evaluation of Core Protection Calculator System Equipment for Waterford Unit 3 Auxiliary Protection Cabinet," October 22, 2020 is now in the WEC ERR.	Closed (V)	This open item can be closed after Document CN-EQT-20-2 is docketed.
33	EQ-08	Different Equipment Under Test (EUT) (Jack Zhao)	EQ-QR-412-CWTR3, Rev. 0	Sections 4.1, 4.2, and 4.3	The Equipment Under Test (EUT) contains different items for the EMC, environmental, and seismic testing. Please clarify why the EUT is different for the three types of EQ testing. 03/17/2021 Update: In this EQ testing summary report for specific project equipment, for each project device which does not need a certain test, please include the justification for its exclusion from the test when this report gets to be revised and then submitted for docketing.	Most of the CPCS equipment listed in Table 2.1-1 of EQ-QR-412-CWTR3 was qualified by prior Westinghouse test programs. Discussion of prior qualification is documented in Section 3 of EQ-QR-412-CWTR3. For the equipment that required new testing for the WF3 application, some equipment was tested as complete assemblies, including the APC MUX and AC power distribution panel. In other cases, individual components were tested based on the change from the assemblies previously qualified, such as the surge suppressor on the DC power distribution panel. Some of these individual components only required specific testing and did not need to be included in all three phases of testing. For example, the surge suppressor only required EMC testing; seismic and environmental testing were justified by similarity to the previously qualified surge suppressor originally used in the DC power distribution panel. Additionally, the line filter and other components had to be moved from the AC power distribution panel to a separate panel. The separate line filter panel was then included in the subsequent seismic test while the EMC and environmental tests only	Open	An RAI is needed

						list the AC power panel with a note discussing the modifications to that panel.		
34	SA-04	CPP Processor (Samir Darbali)	3.2.2 CEAC AC160 Controller	3-17	LTR Section 3.2.2 describes the CEAC AC160 controller modules and states in page 3-17: "• Two PM646A CPP processor module" 34.1 Please confirm that the "Two" is a typo and that the correct subsection title is "One PM646A CPP processor module". 34.2 Please confirm if this typo will be corrected in a future LTR revision.	That is a typographical error in the document. The statement "Two PM646A CPP processor module" will be replaced by "One PM646A CPP processor module".	Closed	
35	CCF-02	CCF (Summer Sun, Samir Darbali)			LTR-TA-19-154, "Waterford 3 Core Protection Calculator System Safety Function Table" (item A-01y on the Certrec portal), Table A-1, identifies fifteen Chapter 15 events that credit the WF3 CPCS. (1) Please confirm that the events that credit the CPCS trips in the FSAR analysis are limited to those events listed in LTR-TA-19-154, Table A-1. (2) Please identify the backup safety-related analog trip for each of the events that credit the CPCS. If a backup analog trip does not exist for a specific event, please identify if an alarm is provided so that manual action can be taken. (3) Please reference the sources of information for items (1) and (2) above. (4) LTR-TA-20-4, "Waterford Unit 3 Common Q Implementation –Non-LOCA Evaluation of Updated CPCS Response Times" (item A-01o on the Certrec portal), Table 1, "Waterford-3 Non-LOCA CPCS Trip Signals" identifies 13 events that credit the WF3 CPCS. "CEA Misoperation – Single Rod Drop/CEA Sub-group Drop" and "Uncontrolled Boron Dilution" are included in LTR-TA-19-154 but not on LTR-TA-20-4 Table 1. (4.1) Please explain why these events are not included in LTR-TA-20-4, Table 1. (4.2) Please explain if the response times for these events are affected by the Common Q CPCS replacement. 2/2/2021 Update: (5) Please submit LTR-TA-20-4, "Waterford Unit 3 Common Q Implementation –Non-LOCA Evaluation of Updated CPCS Response Times" on the docket. 2/11/2021 Update: (6) Please submit LTR-TA-21-17, "Waterford 3 CPCS Safety Function Table – PPS Backup Trips," on the docket. (7) The third column of LTR-TA-21-17, Table A-1 refers to Table 7.2-4 of Reference 1. Reference 1 (ML19268A136) is for the WF3 FSAR Chapter 15 only, and not the entire FSAR. Chapter 7, which contains Table 7.2-4, is not included as one of the references. It might be clearer to keep Reference 1 for Chapter 15 and add a new Reference 3 for FSAR Chapter 7, and update the reference number in the third column of Table A-1, accordingly.	(1) The purpose of LTR-TA-19-154 is to identify the Chapter 15 events for which the CPCS responds. It is an independently reviewed engineering analysis, and as such the references listed in LTR-TA-19-154 are the sources of information to inform the analysis. (2) The attached document, LTR-TA-21-17 identifies the backup safety-related analog trips for each of the events that credit the CPCS. In all cases a backup safety-related analog trip exists except for the CEA Misoperation – Single Rod Drop / CEA Sub-group Drop event. The single CEA and subgroup drop events do not generate a reactor trip. (3) For CCF-02a response: The Reference section of LTR-TA-19-154 is the source of information. For CCF-02b response: LTR-TA-21-17 is the source of information (4.1) LTR-TA-20-4 states, ""First, the Chapter 15 non-LOCA transients were screened to identify the impacted events. The impacted events only include those that: a) trip via a CPCS trip and b) have an increased response time. Updated CPCS response times that do not result in an increased response time have no unfavorable impact on the non-LOCA analyses and "are therefore not required to be evaluated herein." These two events were not included in LTR-TA-20-04 for the following reasons: "CEA Misoperation – Single Rod Drop/CEA Sub-group Drop" falls under FSAR Section 15.4.1.4 "CEA Misoperation". The single CEA and subgroup drop events do not generate a reactor trip, thus the increases in CPCS response times due to the Common Q system implementation would not impact these events. "Uncontrolled Boron Dilution" falls under FSAR Section 15.4.1.5 "CVCS Malfunction (inadvertent boron dilution)". The Boron dilution event is analyzed for all modes of plant operation. The operational Modes 1 and 2 inadvertent boron dilution event is bounded by the FSAR Sections 15.4.1.2 and 15.4.1.3 HFP and HZP CEAW events. The increases in CPCS response times due to the Common Q system implementation would not change the event characteristics, so the inadvertent boron dilution event remains bounded by existing UFSAR events. For the inadvertent boron dilution event in operational Modes 3, 4, 5 and 6, all CEAs have already been inserted. Thus, the	Closed	RAIs for 35.1, 35.2, 35.4.1, 35.4.2

					(8) Please provide a summary of the process used for developing LTR-TA-21-17 to identify the PPS backup trip signals for the Chapter 15 events that credit the CPCS.	increases in CPCS response times due to the Common Q system implementation would have no impact on the inadvertent boron dilution event. (4.2) The response times for these events are not affected by the Common Q CPCS replacement as discussed in Open Item 035c (4.1), CCF-02c. (5) Document (LTR-TA-20-4, "Waterford Unit 3 Common Q Implementation –Non-LOCA Evaluation of Updated CPCS Response Times) submitted to NRC on 05-Mar-2021; ADAMS Accession Nos. ML21064A535 and ML21064A536. (6) Revision 1 of LTR-TA-21-17 was docketed. (7) LTR-TA-21-17 Revision 1 adds a reference to WF3 FSAR Chapter 7 and updates Column 3 to cite the new reference. (8) UPDATE: Revision 1 of LTR-TA-21-17 includes a summary of the process used for developing the document to identify the PPS backup trip signals for the Chapter 15 events that credit the CPCS. LTR-TA-21-17 will be revised to reference Chapter 7 to identify the PPS analog trips that serve as the backup trips for the CPCS. The WF3 UFSAR does not define the PPS analog trips that backup the CPCS trips in the case of a Common Cause Failure (CCF) of all four channels of the CPCS. As described in the response to OI 18, CCF-01; The CPCS was not reviewed in its entirety by the NRC as stated in the NRC Waterford Unit 3 SER, NUREG 0787, "Safety Evaluation Report related to the operation of Waterford Steam Electric Station, Unit No. 3, dated July 1981". Section 7.2.3 states: "The CPCs were not reviewed, per se, at Waterford 3. The staff has taken the operating experience of ANO-2, the previous review, and acceptance of the ANO-2 CPCs, and the similarity of the Waterford 3 and ANO-2 CPCs, into account in reaching this decision." The NRC concluded in the SER that the "…NRC considers the CPC design acceptable." In the Palo Verde Common Q CPCS SER, the NRC staff quotes from the ANO-2 NRC SER (NUREG-0308 Supplement 1, Appendix D) summarizing the CCF analysis and PPS backup trips to the CPCS and concludes the following: - Palo Verde possesses an almost identical backup set of hardware implemented RPS trip functions as ANO-2. - Palo Verde RPS trips are identical with the exception that Palo Verde also has Low Flow RPS trip based on Steam Generator primary side differential pressure. This trip is used to provide sheared [RCP] shaft event protection, but would serve as a backup for any loss of flow event, including a seized RCP shaft. (OI Response Note: this is also true for WF3) - Replacement of the [existing] four CPC channel hardware with a common qualified platform presents a digital to digital upgrade of the		

						Palo Verde CPC system. Licensing of this system addressed diversity issues by assuming a common cause failure of all four CPC channels. As noted in the Safety Evaluation Report issued to ANO-2 on the CPC channels, the NRC found the backup analog trips, inherent shutdown mechanisms, and provisions for manual operator action acceptable. In summary the NRC staff accepted the ANO-2 analysis of analog PPS trips that back up the CPCS trips for the Palo Verde Common Q CPCS replacement. The Palo Verde plant is a C-E System 80 plant which is significantly different than the ANO-2 C-E 3410 plant design. Whereas the WF3 plant design is a C-E 3410 plant evolutionary version of the C-E 3410 plant design at ANO-2. Since the NRC staff accepted the ANO-2 analysis for the Palo Verde plant CPC Common Q replacement, the same analysis could be applied to the WF3 plant, that is closer in design similarity than the Palo Verde plant. This would explain why the NRC staff chose not to review the original CPCS for WF3 in its entirety from the ANO-2 implementation, due to the similarities in power plant design.		
36	RT-02	Response Times (Summer Sun, Samir Darbali)			[[ ]]	36.1 [[ ]] A figure correlating the columns in both documents is in the Westinghouse ERR under the folder Open Item 36 (RT-02). 36.2 LTR-GIC-20-003, Revision 1 submitted to NRC on 05-Mar-2021; ADAMS Accession Nos. ML21064A535 and ML21064A536.	Closed	36.1 to become RAI for last sentence of response.

					2/2/2021 Update: (36.2) Please submit LTR-GIC-20-003, “Waterford 3 CPCS Response Time Information for FSAR and Technical Specification,” on the docket.			
37	RT-03	Response Times (Summer Sun, Samir Darbali)			**[[** **]]** 2/2/2021 Update: (37.2) Please submit the last revision of WNA-CN-00572-CWTR3 on the docket.	37.1 The manner in which the assumptions in WNA-CN-00572-CWTR3, Section 4.4 are verified and validated are as follows: 1. Assumption: The CONTRM scheduling is assumed to be identical to the CONTRM timing described in 00000- ICE-36369, “CPC Timing Analysis for the Core Protection Calculator System” (Reference 1). The CONTRM timing of MOVE is changed from 500 milliseconds in Reference 1 to 512 milliseconds per Request for Engineering Change (REC) WT3-CPCS-00015. Verification/Validation Method Requirements are specified in the following documents and verified by IV&V WNA-DS-04618-CWTR3, Section 2.7.2, "Software Requirements Specification for the Common Q Core Protection Calculator System" identifies these as requirements: o Requirement number DS-04618-10415 o Requirement number DS-04618-10416 o Requirement number DS-04618-10417 2. Assumption The maximum average loading constraint for a PM is assumed to be 75% for the standard method of determining CPCS response time. Verification/Validation Method This requirement is stated in 00000-ICE-30158 Section 2.5.4. As stated in OI-10 (SDP-03) the plan is to re-run the complete set of PVNGS system validation tests with design changes made for the WF3 implementation (i.e., the One Channel System Test and the 4-Channel FAT). This re-run of the PVNGS system validation tests includes validating the requirements in 00000-ICE-30158 Section 2.5.4. 3. Assumption The WSES CPCS will use an IRP auxiliary relay with a response time less than, or equal to, 20 milliseconds. This assumption corrects the issue described in Reference 6 with respect to the delay value for the relay. Verification/Validation Method The CPC IRP Panel (document number 2E10708) calls out 10167D72G01 for the relay which calls out PS12820H09 which contains Phoenix PLC-OSC- 24DC/ 24DC/ 5/ACT, P/N 2982786. The attached data sheet for the Phoenix PLC-OSC- 24DC/ 24DC/ 5/ACT specifies a response time of 20 µs. (see Attached)	37.1 Closed 37.2 Closed	No RAIs Audit

						4. Assumption The RCPSSSS is assumed to produce 35.7 pulses per second, or greater, at 90% of rated speed (1190 RPM). This assumption requires verification. A more detailed description of this assumption is provided in Section 4.5, item 4. This assumption on the existing RCPSSSS in the WF3 plant is confirmed in Westinghouse document 00000-ICE-36119, "WSES-3 Core Protection Calculator System Input/Output Scaling" Section 4.0). It identifies the values assumed in WNA-CN-00572-CWTR3 for the existing RCPSSSS equipment at WF3. The RCPSSSS is unchanged as a result of the CPCS upgrade. Verification/Validation Method The assumption is based on the low RCP speed auxiliary trip setpoint being 90% of the normal operating speed, or 1071 RPM. The Common Q CPC upgrade CPC/CEAC Database Constants document, WNA-DT-00204-CWTR3, specifies the value K3 which is the setpoint for the pump speed, as a fraction of rated speed, at which this auxiliary trip occurs. The constant is currently listed at 0.965, or 96.5%. Therefore, the 90% assumption in WNA-CN-00572-CWTR3 is conservative. A fifth assumption in Revision 0 of WNA-CN-00572-CWTR3 was deleted because it was addressed and closed in Section 4.2 of revision 1. 37.2 Revision 1 of WNA-CN-00572-CWTR3 submitted to NRC on 05-Mar-2021; ADAMS Accession Nos. ML21064A535 and ML21064A536.		
38	VOP-07	VOP (Deanna Zhang Samir Darbali)	VOP Summary		02/26/21: Please describe the change control requirements that would pertain to the VOP (regarding any changes to the VOP version described in the LAR) after issuance of the amendment.	The Vendor Oversight Plan (VOP) will be updated to provide wording to notify personnel of the need to review the approved Safety Evaluation Report (SER) prior to approval of changes to the document. The VOP will then be formally loaded into the Entergy document control system as an engineering controlled document via the Engineering Change process, which is governed by existing Entergy procedure EN-DC-115. Future changes to the VOP would require an Engineering Change, and as part of that change process, personnel would review the SER per added wording in the VOP to ensure non-conservative changes are not made (i.e., non-conservative changes refer to changes that reduce Entergy's oversight of vendor actions or ability to meet both the process and technical regulatory requirements). The VOP for the CPC project, like the Critical Procurement Plan, will no longer be controlled once the modification has been fully implemented and formally turned over to Operations.	Open	RAI
39	VOP-08	VOP (Deanna Zhang Samir Darbali)	VOP Summary		04/12/21: The NRC staff audited VOP-WF3-2019-00236, Revision 3, to identify details supporting the VOP Summary's description of vendor oversight activities and associated processes to perform these activities. During this audit, the NRC staff also verified whether the licensee's performance of the vendor oversight		Open	RAI

					activities for the requirements phase of the CPCS development lifecycle were conducted in accordance with the VOP. The NRC staff had the following observations during the audit: 1. The description of oversight activities related to independent verification and validation (IV&V) is distributed over various sections of the VOP. As a result, the VOP does not describe consistently the planned oversight activities of the vendor's IV&V tasks and reports for each phase of the CPCS development lifecycle. 2. The terminology used regarding requirements traceability analysis within the VOP does not distinguish between the traceability activities that will be performed by the licensee and the IV&V activities performed by the vendor. 3. The VOP does not clearly distinguish between design artifacts that would be audited by the licensee and those that would be reviewed and accepted in accordance with the licensee's procedures, EN-DC-149, "Acceptance of Vendor Documents." 4. The numbering scheme used in the VOP does not allow for oversight activity topics and associated descriptions within each topic to be clearly identifiable. Because of the issues identified in these observations, it appears that the licensee did not perform certain oversight activities related to vendor IV&V tasks and outputs for the requirements phase of the CPCS development lifecycle. The VOP Summary is derived from the content of the VOP and, as such, these observations also apply to the VOP Summary. Therefore, the NRC staff requests the licensee to (1) confirm that it has revised the VOP to address the issues identified in the above four observations, and (2) supplement the LAR with the corresponding changes to the VOP Summary to reflect the VOP changes, to demonstrate that the VOP and VOP Summary contain clear and consistent descriptions of vendor oversight activities.			
40	HFE-01	HFE (DaBin Ki)			In Attachment 13 (Non-Proprietary), "Human Factors Engineering Analysis," Section 3, "Operating Experience Review," Subsection 1, "Predecessor/Related Plants and Systems," of the LAR, Entergy stated the following: *This OE is documented in formal benchmarking reports tracked by LO-WLO-2018-00081 (initial Maintenance benchmark) and LO-HQNLO-2019-00086 (Engineering benchmark held in March 2020) (References 12 and 13).* However, in Section 14, "References," of Attachment 13, the title for Reference 12 states, "LO-HQNLO-2018-0081, CPCS Benchmarking Report." Please confirm the correct document number and title for the benchmarking report.		Open	

Open Item Status Summary

No.	IMS ID	Status	RAI – RCI – Audit	Licensee Planned Submittal/Revisions	Notes
1	ST-01	Closed (V)		Revise LAR Enclosure Sections 2.3 and 2.4 as described in Response section. The LTR Appendix B does not need to be revised because the justification is both Appendix B and Engineer and Operations Actions Supporting TS SR Reduction (LAR Section 3.4). Only the LAR needs to be revised to account for both justifications.	LAR change will need to be verified.
2	ST-02	Closed	No RAIs	This OI could be closed if WEC were to put the text provided in the response into WCAP-18484. If they do not do this, then the RAI will request that.	Change to WCAP-18484 verified 3/11/2021.
3	ST-03	Closed	No RAIs	The LTR Appendix B will be revised.	Change to WCAP-18484 verified 3/11/2021.
4	ST-04	Closed	No RAIs	The sentence in the LTR will be revised.	I also noted that page numbering in Appendix B resets to 0 after page B-37.
5	ST-05	Closed	No RAIs	Consistent with Westinghouse WCAP-18461, the following text will be deleted from the LTR (WCAP-18464).	Note: The NRC did not ask for whole section to be deleted. Instead the staff only commented on one statement within the Section.
6	SA-01	Closed	RAI for 6(b)	(a.1) The LAR Enclosure will be revised per the response to SA-01a.	
7	SDP-01	Closed	No RAIs		
8	SDP-02	Closed	No RAIs		
9	SDP-04	9(a) Closed 9(b) Closed 9(c) will be closed either through audit or by RAI	RAI for 9(c)	9(c) will be closed either through audit or by RAI	
10	SDP-03	Closed	No RAIs		
11	VOP-01	Closed	Audited		
12	VOP-02	Closed	Audited		
13	VOP-03	Closed	Audited		
14	VOP-04	Closed	Audit		
15	VOP-05	Closed	Audited		
16	VOP-06	Closed	Audit		
17	RT-01	17.1 Closed 17.1.1 Closed 17.2 Closed 17.3 Closed 17.3.1 Closed 17.4 Closed	RAIs (17.1, 17.1.1, 17.2, 17.3, 17.3.1, 17.4)	17.3 The response may need to be updated in the RAI to account for the document revision 17.3.1 The response may need to be updated in the RAI to account for the document revision	
18	CCF-01	18.a Closed 18.b Closed 18.c Closed 18.d Closed 18.c.1 Open 18.d1 Open	None	18.c.1: Waiting for LAR supplement 18.d.1: Provide a LAR supplement	
19	TS-01	Closed	RCI		
20	TS-02	Closed	RAI	Revised/New TS Markup and Clean pages	
21	EQ-01	Closed	RAI		
22	EQ-02	Closed (V)		The LAR will be revised.	

23	EQ-03	Closed			
24	EQ-04	Open	RAI	RAI will be issued to get the requested document on to the docket	
25	EQ-05	Closed	No RAI	EQ-QR-412-CWTR3, Revision 1 will be docketed by 12/31/2020	
26	A-01			.	
27	A-02			Audit activity 1. is still pending. Staff will coordinate with the Entergy and Westinghouse. More audit activities may be added to OI 26	
28	A-03			VOP Audit activities. These are being tracked in a separate file.	
29	SA-02	Closed	None	LTR updated to address the OI	
30	SA-03	Open			
31	EQ-06	Open			
32	EQ-07	Open	RAI	RAI will be issued to get the requested document on to the docket	
33	EQ-08	Open			
34	SA-04	Closed	None	LTR updated to address the OI	
35	CCF-02	35.1 Closed 35.2 Closed 35.3 Closed 35.4.1 Closed 35.4.2 Closed 35.5 Closed 35.6 Closed 35.7 Closed 35.8 Closed	RAIs (35.1, 35.2, 35.3)	35.1 to become RAI 35.2 to become RAI 35.3 to become RAI	
36	RT-02	36.1 Closed 36.1 Closed	RAI (36.1)	36.1 to become RAI for the last sentence of the response.	
37	RT-03	Closed	No RAIs	For audit	
38	VOP-07	Open	RAI		

Note: "Closed (V)" indicates that NRC will need to verify changes to the specified documents after a supplement is received from the licensee.

ACRONYMS/ABBREVIATIONS

ACRONYM/ ABBREVIATION	DEFINITION	ACRONYM/ ABBREVIATION	DEFINITION
A	Audit (only used for identification of open items in IMS)	MCR	Main Control Room
ANO	Arkansas Nuclear One	NRC	U.S. Nuclear Regulatory Commission
ARP	Alternate Review Process	OI	Open Item
Att.	Attachment	OM	Operator Modure
ATWS	Anticipated Transient Without a Scram	PSAI	Plant Specific Action Items
BTP	Branch Technical Position	PVNGS	Palo Verde Nuclear Generation Station
CCF	Common Cause Failure/D3	RAI	Request for Additional Information
CEA	Control Element Assembly	RC	Regulatory Commitments
CPP	Critical Procurement Plan	RCI	Request for Confirmation of Information
CFR	Code of Federal Regulations	RT	Response Time
CPCS	Core Protection Calculator System	RTM	Requirements Traceability Matrix
CPU	Central Processing Unit	SA	System Architecture (only used for identification of open items in IMS)
D3	Defense in Depth and Diversity	SDOE	Secure Development and Operational Environment
DNBR	Departure from Nucleate Boiling Ratio	SDP	Software Development Plan; System Development Processes, including SPM PSAIs (only used for identification of open items in IMS)
DWGS	Drawings	SE	Safety Evaluation
Encl.	Enclosure	SFCP	Surveillance Frequency Control Program
EQ	Environmental Qualification	SPM	Software Program Manual

EQSR	Equipment Qualification Summary Report	SR	Surveillance Requirement
FAT	Factory Acceptance Testing	SRS	Software Requirements Specification
FME	Foreign Material Exclusion	ST	Surveillance Testing/Self-Diagnostics/SR Elimination (only used for identification of open items in IMS)
FSAR	Final Safety Analysis Report	SVVP	Software Verification and Validation Plan
GDC	General Design Criterion (or Criteria)	SW. Dev. Plan	Software Development Plan
HFE	Human Factors Engineering	SyRS or Sys. Req. Spec.	System Requirements Specifications
I&C	Instrumentation and Control	TR	Topical Report
ID	Identification	TRM	Technical Requirements Manual
IEC	International Electrotechnical Commission	TS	Technical Specifications
IEEE	Institute of Electronic and Electrical Engineering	V&V	Validation and Verification
ISG	Interim Staff Guidance	VOP	Vendor Oversight Plan
[CERTREC] IMS	Inspection Management System	WF3 or W3	Waterford Steam Electric Station, Unit 3
LAR	License Amendment Request	WCAP	Westinghouse document
LHGR	Linear Heat Generation Rate	WEC	Westinghouse Electric Corporation
LTR	Licensing Technical Report	WWDT	Window Watchdog Timer

SUBJECT: SUMMARY OF APRIL 14, 2021, PARTIALLY CLOSED OBSERVATION MEETING WITH ENTERGY OPERATIONS, INC. REGARDING LICENSE AMENDMENT REQUEST TO INSTALL DIGITAL UPGRADE IN ACCORDANCE WITH DIGITAL INSTRUMENTATION AND CONTROL INTERIM STAFF GUIDANCE NO. 06, REVISION 2, "LICENSING PROCESSES" (EPID L-2020-LLA-0164) DATED MAY 7, 2021

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ADAMS Accession Nos.:
ML21111A351 (Package)
ML21111A354 (Meeting Summary - Proprietary)
ML21112A249 (Meeting Summary - Non-Proprietary)

OFFICE	NRR/DORL/LPL4/PM	NRR/DORL/LPL4/LA	NRR/DSS/SNSB/BC	NRR/DRO/IQVB/BC
NAME	AKlett	PBlechman	SKrepel	KKavanagh
DATE	04/29/2021	04/28/2021	04/29/2021	04/29/2021
OFFICE	NRR/DEX/EICB/BC	NRR/DORL/LPL4/BC	NRR/DORL/LPL4/PM	
NAME	MWaters	JDixon-Herrity	PBuckberg (AKlett for)	
DATE	04/29/2021	04/30/2021	05/07/2021	

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