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

April 23, 2020

LICENSEE: Entergy Operations, Inc.

FACILITY: Waterford Steam Electric Station, Unit 3

SUBJECT: SUMMARY OF MARCH 19, 2020, CATEGORY 1 PUBLIC MEETING WITH ENTERGY OPERATIONS, INC. REGARDING A PLANNED LICENSE AMENDMENT REQUEST TO INSTALL DIGITAL SYSTEMS IN ACCORDANCE WITH DIGITAL INSTRUMENTATION AND CONTROL INTERIM STAFF GUIDANCE (DI&C ISG)-06 REVISION 2, "LICENSING PROCESSES" (EPID L-2020-LRM-0016)

On March 19, 2020, a Category 1 partially closed public meeting was held between the U.S. Nuclear Regulatory Commission (NRC), representatives of Entergy Operations, Inc. (Entergy, the licensee), and Westinghouse Electric Company, LLC (Westinghouse) regarding a planned license amendment request (LAR) for Waterford Steam Electric Station, Unit 3 (Waterford 3). The meeting notice and agenda, dated February 28, 2020, are available in the Agencywide Documents Access and Management System (ADAMS) at Accession No. ML20059N287. A public version of the licensee's presentation is available at ADAMS Accession No. ML20072P204. In addition, the NRC staff prepared a list of topics for discussion, which is available at ADAMS Accession No. ML20059K156. The list of attendees to this meeting is included as Enclosure 1. The licensee provided a draft version of the proposed technical specifications (TSs) markup, which is included as Enclosure 2.

By letter dated May 16, 2019 (ADAMS Accession No. ML19137A082), the licensee expressed intent to submit an LAR for an upgrade to the digital instrumentation and control (DI&C) system at Waterford 3 in spring 2020. The same letter also requested a fee waiver for the review of the application. A partial fee waiver was granted by letter dated October 30, 2019 (ADAMS Accession No. ML19280C270).

The purpose of this partially closed meeting was to further discuss a planned LAR to replace the core protection calculator (CPC) and control element assembly calculator (CEAC) systems with digital systems in accordance with DI&C Interim Staff Guidance (ISG) DI&C-ISG-06, Revision 2, "Licensing Processes" (ADAMS Accession No. ML18269A259). This letter summarizes the fourth presubmittal meeting pertaining to this planned LAR. Specifically, the primary topics discussed at this meeting were impacts of the LAR on the Waterford 3 TSs, the failure mode effects analysis (FMEA) and failure modes effects and diagnostic analysis (FMEDA), and the vendor oversight program (VOP).

During the open portion of the meeting, the licensee and NRC staff discussed an updated timeline for submittal of the LAR. During the public meeting held on January 16, 2020, the licensee had proposed to submit a draft version of the LAR in early June 2020 for cursory initial review by the NRC staff, followed by a final presubmittal meeting. During the meeting on March 19, 2020, the NRC staff indicated that providing a brief initial review for this particular draft LAR would be acceptable due to the first-of-a-kind nature of the alternate review process

outlined in DI&C-ISG-06 Revision 2. The NRC staff indicated that review of this draft LAR should not set a precedent for future LARs.

During the closed portion of the meeting, the licensee presented additional proprietary details of the impact of the proposed digital modification on the current Waterford 3 TSs. The licensee stated that the TS changes will be modeled after the TS changes made for a digital modification at Palo Verde Nuclear Generating Station. The licensee also stated that the revised TSs include new actions that would ensure the CPC and CEAC systems would never be in a configuration that represents an action not described in the TSs. The NRC staff expressed concern with the licensee's proposal to eliminate the channel function test surveillance requirement in the TSs, and requested that the licensee include in its application how the performance of the self-diagnostics function of the Common Q platform would be verified if this surveillance was removed from the TSs. Entergy and Westinghouse also clarified the difference between the FMEA and FMEDA and described how each would be utilized in the Waterford 3 digital systems.

The licensee gave further details about its planned VOP and provided tentative dates for planned audits of the regression analyses and requirements tracability. The licensee stated that it intends to audit Westinghouse's design process for the Common Q platform. The licensee also stated that the VOP would provide acceptance criteria for life-cycle development topics such as quality assurance, software verification and validation, and secure development environment. The NRC staff expressed interest in observing Entergy's audits, because similar vendor audits were normally conducted by the staff for prior applications.

Finally, the licensee addressed the questions in Item Nos. 5 and 6 of the NRC-prepared discussion topics. The licensee clarified the definition of the term "architecture level" and clarified the version of the Common Q topical report that would be referenced in the LAR. The licensee also provided the planned dates for implementation testing, factory acceptance testing, and site acceptance testing.

No regulatory decisions were reached at this meeting. No members of the public attended the meeting. No Public Meeting Feedback forms were received.

Please direct any inquiries to me at 301-415-1390 or April.Pulvirenti@nrc.gov.

Sincerely,

/RA/

April Pulvirenti, 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. Draft Technical Specifications Markup

cc: Listserv

LIST OF ATTENDEES

MARCH 19, 2019, PARTIALLY CLOSED PRESUBMITTAL MEETING WITH

ENTERGY OPERATIONS, INC

WATERFORD STEAM ELECTRIC STATION, UNIT 3

U.S. Nuclear Regulatory Commission
Rossnyev Alvarado
Kristy Bucholtz
Calvin Cheung
Samir Darbali
Jennifer Dixon-Herrity
DaBin Ki
April Pulvirenti
Richard Stattel
Dinesh Taneja
Michael Waters
Jack Zhao

Entergy Operations, Inc.
Jacob Champagne
David Constance
Janice Cruz
Ron Gaston
Loren Miller
Roger Rucker
John Schrage
Paul Wood

Sargent and Lundy
Pareez Golub

Jensen Hughes, Inc.
Alan Harris

Westinghouse Electric Company, LLC
Allen Denyer
Steven Merkiel
Warren Odess-Gillett
Matthew Shakun
John Wiesemann

ENCLOSURE 2

DRAFT TECHNICAL SPECIFICATIONS MARKUP

Waterford 3 CPC Upgrade
Tech Specs - Markup Description

WF3 TS	LCO	Change
2.2.1	Reactor Trip Setpoints	Table 2.2-1 "Reactor Protective Instrumentation Trip Setpoint Limits" - Combined CPC, CEAC, LPD, DNBR under single FUNCTIONAL UNIT 9
3.1.3.1	CEA Position	SR 4.1.3.1.1 CEA Position Verification - Revised wording to align with 8 CEAC configuration (For instance, "Both" changed to "All" for when no CEACs Operable)
3.2.4	DNBR Margin	Reformated LCO wording similar to Palo Verde - Separated conditions into COLSS in Service and COLSS Out of Service - Action statements unchanged from current WF3 Tech Spec
3.3.1	Reactor Protective Instrumentation	Table 3.3-1 "Reactor Protective Instrumentation" - Combined CPC, CEAC, LPD, DNBR under single FUNCTIONAL UNIT 9 - Revised values under Total No. of Channels, Channels to Trip, and Minimum Channels OPERABLE to align 8 CEAC configuration - Added Notes (g), (h) and (i) addressing CEAC & CPC operability - Revised entry criteria for Action 6 depending on number of CEACs Inoperable. NOTE: Actions taken are unchanged, based on impact on CPCs. - Deleted Action 7 addressing Auto Restarts
		SR 4.3.1.2 Reactor Trip Response Time - added CPC and CEAC to exemptions from Response Time Testing
		SR 4.3.1.4 Isolation Amp and Optical Isolator checks - Deleted entire SR
		SR 4.3.1.5 Auto Restart count verification - Deleted entire SR
		SR 4.3.1.6 Cabinet High Temperature Alarm - Deleted entire SR
		SR 4.3.1.7 CPC Output Test - New SR to perform manual trip tests
		Table 4.3-1 "Reactor Protective Instrumentation Surveillance Requirements" - Combined CPC, CEAC, LPD, DNBR under single FUNCTIONAL UNIT 9 - Replaced all Channel Functional Test requirements for CPCS (Functional Unit 9) with "NONE"
		- Deleted Note (6) describing refuel interval trip test requirement
		- Deleted Note (9) for verification of addressable constant values
6.8.1	Procedures and Programs	- Note (2) updated with Common Q Software Program Manual information

Note that  indicates no changes on page, included for completeness

2.2 LIMITING SAFETY SYSTEM SETTINGS

REACTOR TRIP SETPOINTS

2.2.1 The reactor protective instrumentation setpoints shall be set consistent with the Trip Setpoint values shown in Table 2.2-1.

APPLICABILITY: As shown for each channel in Table 3.3-1.

ACTION:

With a reactor protective instrumentation setpoint less conservative than the value shown in the Allowable Values column of Table 2.2-1, declare the channel inoperable and apply the applicable ACTION statement requirement of Specification 3.3.1 until the channel is restored to OPERABLE status with its trip setpoint adjusted consistent with the Trip Setpoint value.

TABLE 2.2-1
REACTOR PROTECTIVE INSTRUMENTATION TRIP SETPOINT LIMITS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
1. Manual Reactor Trip	Not Applicable	Not Applicable
2. Linear Power Level - High		
Four Reactor Coolant Pumps Operating	≤ 108% of RATED THERMAL POWER	≤ 108.76% of RATED THERMAL POWER
3. Logarithmic Power Level - High (1)	≤ 0.257% of RATED THERMAL POWER (6)	≤ 0.280% of RATED THERMAL POWER (6)
4. Pressurizer Pressure - High	≤ 2350 psia	≤ 2359 psia
5. Pressurizer Pressure - Low	≥ 1684 psia (2)	≥ 1649.7 psia (2)
6. Containment Pressure - High	≤ 17.1 psia	≤ 17.4 psia
7. Steam Generator Pressure - Low	≥ 666 psia (3)	≥ 652.4 psia (3)
8. Steam Generator Level - Low	≥ 27.4% (4)	≥ 26.48% (4)
9. Core Protection Calculators		
a. Local Power Density - High	≤ 21.0 kW/ft (5)	≤ 21.0 kW/ft (5)
b. DNBR - Low	≥ 1.26 (5)	≥ 1.26 (5)
10. ~~DNBR - Low~~ DELETED		
11. DELETED		
12. Reactor Protection System Logic	Not Applicable	Not Applicable
13. Reactor Trip Breakers	Not Applicable	Not Applicable
14. ~~Core Protection Calculators~~ DELETED	~~Not Applicable~~	~~Not Applicable~~
15. ~~CEA Calculators~~ DELETED	~~Not Applicable~~	~~Not Applicable~~
16. Reactor Coolant Flow - Low	≥ 19.00 psid (7)	≥ 18.47 psid (7)

TABLE 2.2-1 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION TRIP SETPOINT LIMITS

TABLE NOTATIONS

(1) The operating bypass may be enabled above the 10^{-4}% bistable setpoint and shall be capable of automatic removal whenever the operating bypass is enabled and logarithmic power is below the 10^{-4}% bistable setpoint. Trip may be manually bypassed during physics testing pursuant to Special Test Exception 3.10.3.

(2) Value may be decreased manually, to a minimum of 100 psia, as pressurizer pressure is reduced, provided the margin between the pressurizer pressure and this value is maintained at less than or equal to 400 psi; the setpoint shall be increased automatically as pressurizer pressure is increased until the trip setpoint is reached. Trip may be manually bypassed below 400 psia; bypass shall be automatically removed whenever pressurizer pressure is greater than or equal to 500 psia.

(3) Value may be decreased manually as steam generator pressure is reduced, provided the margin between the steam generator pressure and this value is maintained at less than or equal to 200 psi; the setpoint shall be increased automatically as steam generator pressure is increased until the trip setpoint is reached.

(4) % of the distance between steam generator upper and low level instrument nozzles.

(5) As stored within the Core Protection Calculator (CPC). Calculation of the trip setpoint includes measurement, calculational and processor uncertainties, and dynamic allowances. The operating bypass may be enabled below the 10^{-4}% bistable setpoint and shall be capable of automatic removal whenever the operating bypass is enabled and logarithmic power is above the 10^{-4}% bistable setpoint. During testing pursuant to Special Test Exception 3.10.3, trip may be manually bypassed below 5% of RATED THERMAL POWER; the 10^{-4}% bistable setpoint may be changed to less than or equal 5% RATED THERMAL POWER to perform the automatic removal function.

(6) As measured by the Logarithmic Power Channels.

(7) The setpoint may be altered to disable trip function during testing pursuant to Specification 3.10.3.

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

CEA POSITION

LIMITING CONDITION FOR OPERATION

3.1.3.1 All CEAs shall be OPERABLE with each CEA of a given group positioned within 7 inches (indicated position) of all other CEAs in its group.

APPLICABILITY: MODES 1* and 2*.

ACTION:

a. With one or more CEAs inoperable due to being immovable as a result of excessive friction or mechanical interference or known to be untrippable, determine that the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied within 1 hour and be in at least HOT STANDBY within 6 hours.

b. With more than one CEA trippable but misaligned from any other CEA in its group by more than 19 inches (indicated position), be in at least HOT STANDBY within 6 hours.

c. With one CEA trippable but misaligned from any other CEA in its group by more than 19 inches, operation in MODES 1 and 2 may continue, provided that core power is reduced in accordance with the limits specified in the COLR and within 1 hour the misaligned CEA is either:

1. Restored to OPERABLE status within its above specified alignment requirements, or

2. Declared inoperable and the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied. After declaring the CEA inoperable, operation in MODES 1 and 2 may continue pursuant to the requirements of Specification 3.1.3.6 provided:

a) Within 1 hour the remainder of the CEAs in the group with the inoperable CEA shall be aligned to within 7 inches of the inoperable CEA while maintaining the allowable CEA sequence and insertion limits specified in the COLR; the THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation.

b) The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined at least once per 12 hours.

Otherwise, be in at least HOT STANDBY within 6 hours.

*See Special Test Exceptions 3.10.2 and 3.10.4.

LIMITING CONDITION FOR OPERATION (Continued)

ACTION: (Continued)

d. With one or more CEAs trippable but misaligned from any other CEAs in its group by more than 7 inches but less than or equal to 19 inches, operation in MODES 1 and 2 may continue, provided that core power is reduced in accordance with the limits specified in the COLR and within 1 hour the misaligned CEA(s) is either:

1. Restored to OPERABLE status within its above specified alignment requirements, or

2. Declared inoperable and the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied. After declaring the CEA inoperable, operation in MODES 1 and 2 may continue pursuant to the requirements of Specification 3.1.3.6 provided:

a) Within 1 hour the remainder of the CEAs in the group with the inoperable CEA shall be aligned to within 7 inches of the inoperable CEA while maintaining the allowable CEA sequence and insertion limits specified in the COLR; the THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation.

b) The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined at least once per 12 hours.

Otherwise, be in at least HOT STANDBY within the next 6 hours.

e. With one CEA trippable but inoperable due to causes other than addressed by ACTION a., above, and inserted beyond the Long Term Steady State Insertion Limits but within its above specified alignment requirements, operation in MODES 1 and 2 may continue pursuant to the requirements of Specification 3.1.3.6.

f. With one CEA trippable but inoperable due to causes other than addressed by ACTION a., above, but within its above specified alignment requirements and either greater than or equal to 145 inches withdrawn or within the Long Term Steady State Insertion Limits if in CEA group 6 or group P, operation in MODES 1 and 2 may continue.

g. DELETED

h. With more than one CEA trippable but inoperable due to causes other than addressed by ACTION a., above, restore the inoperable CEAs to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours.

SURVEILLANCE REQUIREMENTS

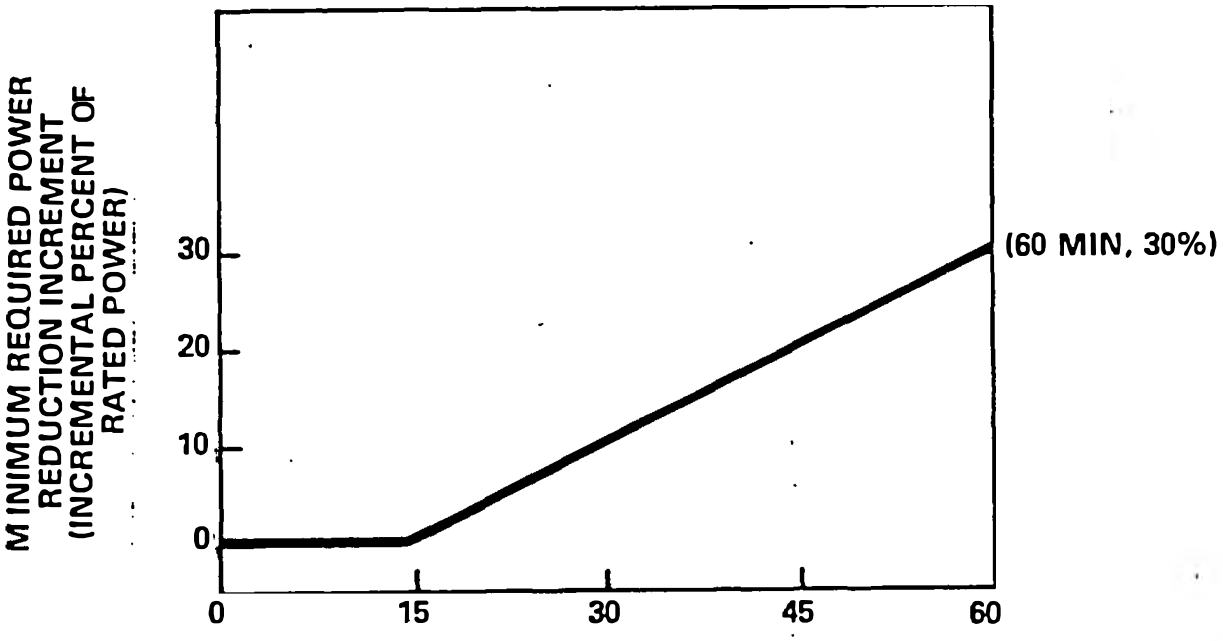
4.1.3.1.1 The position of each CEA shall be determined to be within 7 inches (indicated position) of all other CEAs in its group in accordance with the Surveillance Frequency Control Program ~~except during time intervals when one CEAC is inoperable~~ or when ~~both~~ CEACs are inoperable, then verify the individual CEA positions at least once per 4 hours.

all

4.1.3.1.2 Each CEA not fully inserted in the core shall be determined to be OPERABLE by movement of at least 5 inches in any one direction in accordance with the Surveillance Frequency Control Program.

on any OPERABLE CEAC.

Required Power Reduction after Single CEA Deviation*



*When core power is reduced to 60% of rated power per this limit curve, further reduction is not required by this specification.

Figure 3.1 - 1A

POWER DISTRIBUTION LIMITS

3/4.2.4 DNBR MARGIN

LIMITING CONDITION FOR OPERATION

3.2.4 The DNBR margin shall be maintained by one of the following methods:

a. Core Operating Limit Supervisory System (COLSS) in Service:

1. Maintaining COLSS calculated core power less than or equal to COLSS calculated core power operating limit based on DNBR when at least one Control Element Assembly Calculator (CEAC) is OPERABLE in each OPERABLE Core Protection Calculator (CPC) channel; or

2. Maintaining COLSS calculated core power less than or equal to COLSS calculated core power operating limit based on DNBR decreased by the amount specified in the COLR when the CEAC requirements of LCO 3.2.4.a.1 are not met.

b. COLSS Out of Service

1. Operating within the region of acceptable operation specified in the COLR using any OPERABLE Core Protection Calculator (CPC) channel when at least one Control Element Assembly Calculator (CEAC) is OPERABLE in each OPERABLE CPC channel; or

2. Operating within the region of acceptable operation specified in the COLR using any OPERABLE Core Protection Calculator (CPC) channel (with both CEACS inoperable) when the CEAC requirements of LCO 3.2.4.b.1 are not met.

APPLICABILITY: MODE 1 above 20% of RATED THERMAL POWER.

ACTION:

a. With the DNBR limit not being maintained as indicated by COLSS calculated core power exceeding the COLSS calculated core power operating limit based on DNBR, within 15 minutes initiate corrective action to reduce the DNBR to within the limits and either:

1. Restore the DNBR to within its limits within 1 hour, or

2. Reduce THERMAL POWER to less than or equal to 20% of RATED THERMAL POWER within the next 6 hours.

b. With the DNBR limit not being maintained as indicated by operation outside the region of acceptable operation specified in the COLR with COLSS out of service, either:

1. Restore COLSS to service within 2 hours, or

2. Restore the DNBR to within its limits within the next 2 hours, or

3. Reduce THERMAL POWER to less than or equal to 20% of RATED THERMAL POWER within the next 6 hours.

SURVEILLANCE REQUIREMENTS

4.2.4.1 The provisions of Specification 4.0.4 are not applicable.

4.2.4.2 The DNBR shall be determined to be within its limits when THERMAL POWER is above 20% of RATED THERMAL POWER by continuously monitoring the core power distribution with the Core Operating Limit Supervisory System (COLSS) or, with the COLSS out of service, by verifying in accordance with the Surveillance Frequency Control Program that the DNBR, as indicated on any OPERABLE DNBR channel, is within the limit specified in the COLR.

4.2.4.3 In accordance with the Surveillance Frequency Control Program, the COLSS Margin Alarm shall be verified to actuate at a THERMAL POWER level less than or equal to the core power operating limit based on DNBR.

3/4.3 INSTRUMENTATION

3/4.3.1 REACTOR PROTECTIVE INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.1 As a minimum, the reactor protective instrumentation channels and bypasses of Table 3.3-1 shall be OPERABLE.

APPLICABILITY: As shown in Table 3.3-1.

ACTION:

As shown in Table 3.3-1.

SURVEILLANCE REQUIREMENTS

4.3.1.1 Each reactor protective instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations for the MODES and at the frequencies shown in Table 4.3-1.

4.3.1.2 The logic for the bypasses shall be demonstrated OPERABLE prior to each reactor startup unless performed during the preceding 92 days. The total bypass function shall be demonstrated OPERABLE in accordance with the Surveillance Frequency Control Program during CHANNEL CALIBRATION testing of each channel affected by bypass operation.

4.3.1.3 The REACTOR TRIP SYSTEM RESPONSE TIME of each reactor trip function shall be demonstrated to be within its limit in accordance with the Surveillance Frequency Control Program. Neutron detectors, Core Protection Calculators, and CEACs are exempt from response time testing. Each test shall include at least one channel per function such that all channels are tested as shown in the "Total No. of Channels" column of Table 3.3-1.

~~4.3.1.4 The isolation characteristics of each CEA isolation amplifier and each optical isolator for CEA Calculator to Core Protection Calculator data transfer shall be verified in accordance with the Surveillance Frequency Control Program during the shutdown per the following tests:~~

~~a. For the CEA position isolation amplifiers:~~

~~1. With 120 volts AC (60 Hz) applied for at least 30 seconds across the output, the reading on the input does not exceed 0.015 volts DC.~~

SURVEILLANCE REQUIREMENTS (Continued)

2. With 120 volts AC (60 Hz) applied for at least 30 seconds across the input, the reading on the output does not exceed 15.0 volts DC.

b. For the optical isolators: Verify that the input to output insulation resistance is greater than 10 megohms when tested using a megohmmeter on the 500 volt DC range. DELETED

4.3.1.5 The Core Protection Calculator System and the Control Element Assembly Calculator System shall be determined OPERABLE in accordance with the Surveillance Frequency Control Program by verifying that less than three auto restarts have occurred on each calculator during the past 12 hours. DELETED

4.3.1.6 The Core Protection Calculator System shall be subjected to a CHANNEL FUNCTIONAL TEST to verify OPERABILITY within 12 hours of receipt of a High CPC Cabinet Temperature alarm. DELETED

4.3.1.7 Perform a test on the CPC DNBR/LPD trip output through the contact interface to the PPS in accordance with the Surveillance Frequency Control Program.

TABLE 3.3-1
REACTOR PROTECTIVE INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
1. Manual Reactor Trip	2 sets of 2	1 set of 2	2 sets of 2	1, 2	1
	2 sets of 2	1 set of 2	2 sets of 2	3*, 4*, 5*	8
2. Linear Power Level - High	4	2	3	1, 2	2#, 3#
3. Logarithmic Power Level-High					
a. Startup and Operating	4	2(a)(d)	3	2**	2#, 3#
	4	2	3	3*, 4*, 5* 8	
b. Shutdown	4	0	2	3, 4, 5	4
4. Pressurizer Pressure - High	4	2	3	1, 2	2#, 3#
5. Pressurizer Pressure - Low	4	2(b)	3	1, 2	2#, 3#
6. Containment Pressure - High	4	2	3	1, 2	2#, 3#
7. Steam Generator Pressure - Low	4/SG	2/SG	3/SG	1, 2	2#, 3#
8. Steam Generator Level – Low	4/SG	2/SG	3/SG	1, 2	2#, 3#
9. Core Protection Calculators (g)(h)	4	2(c)(d)(h)	3	1, 2	2#(g)(h)(i), 3#(g)(h)(i)
a. Local Power Density – High					
b. DNBR – Low					
c. CEA Calculators (i)	4(g)(i)	2	4(g)(i)	1, 2	6(i)
10. ~~DNBR – Low~~ DELETED	~~4~~	~~2(c)(d)~~	~~3~~	~~1, 2~~	~~2#, 3#~~
11. DELETED					
12. Reactor Protection System Logic	4	2	3	1, 2	5
				3*, 4*, 5*	8
13. Reactor Trip Breakers	4	2(f)	4	1, 2	5
				3*, 4*, 5*	8
14. ~~Core Protection Calculators~~	~~4~~	~~2(c)(d)~~	~~3~~	~~1, 2~~	~~2#, 3# and 7~~
15. ~~CEA Calculators~~	~~2~~	~~1~~	~~2(e)~~	~~1, 2~~	~~6 and 7~~
16. Reactor Coolant Flow - Low	4/SG	2/SG(c)	3/SG	1, 2	2#, 3#

TABLE 3.3-1 (Continued)

TABLE NOTATION

*With the protective system trip breakers in the closed position, the CEA drive system capable of CEA withdrawal, and fuel in the reactor vessel.

#The provisions of Specification 3.0.4 are not applicable.

**Not applicable above a logarithmic power of 10^{-4} % RATED THERMAL POWER.

(a) The operating bypass may be enabled above the 10^{-4}% bistable setpoint and shall be capable of automatic removal whenever the operating bypass is enabled and logarithmic power is below the 10^{-4}% bistable setpoint. Trip may be manually bypassed during physics testing pursuant to Special Test Exception 3.10.3.

(b) Trip may be manually bypassed below 400 psia; bypass shall be automatically removed whenever pressurizer pressure is greater than or equal to 500 psia.

(c) The operating bypass may be enabled below the 10^{-4}% bistable setpoint and shall be capable of automatic removal whenever the operating bypass is enabled and logarithmic power is above the 10^{-4}% bistable setpoint. During testing pursuant to Special Test Exception 3.10.3, trip may be manually bypassed below 5% of RATED THERMAL POWER; the 10^{-4}% bistable setpoint may be changed to less than or equal 5% RATED THERMAL POWER to perform the automatic removal function.

(d) Trip may be bypassed during testing pursuant to Special Test Exception 3.10.3.

(e) See Special Test Exception 3.10.2.

(f) Each channel shall be comprised of two trip breakers; actual trip logic shall be one-out-of-two taken twice.

(g) There are two CEACs in each CPC channel.

(h) Both Local Power Density-High and DNBR-Low must be OPERABLE for a CPC channel to be OPERABLE.

(i) Both CEACs in an inoperable CPC channel are considered inoperable.

TABLE 3.3-1 (Continued)

TABLE NOTATION

ACTION STATEMENTS

ACTION 1 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or be in at least HOT STANDBY within the next 6 hours and/or open the protective system trip breakers.

ACTION 2 - With the number of channels OPERABLE one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may continue provided the inoperable channel is placed in the bypassed or tripped condition within 1 hour. If the inoperable channel is bypassed, the desirability of maintaining this channel in the bypassed condition shall be documented by the On-Site Safety Review Committee in accordance with plant administrative procedures. The channel shall be returned to OPERABLE status prior to STARTUP following the next COLD SHUTDOWN.

TABLE 3.3-1 (Continued)

ACTION STATEMENTS

With a channel process measurement circuit that affects multiple functional units inoperable or in test, bypass or trip all associated functional units as listed below:

	Process Measurement Circuit	Functional Unit Bypassed/Tripped
1.	Linear Power (Subchannel or Linear)	Linear Power Level - High Local Power Density - High DNBR - Low
2.	Pressurizer Pressure - High	Pressurizer Pressure - High Local Power Density - High DNBR - Low
3.	Containment Pressure - High	Containment Pressure - High (RPS) Containment Pressure - High (ESF)
4.	Steam Generator Pressure - Low	Steam Generator Pressure - Low Steam Generator ΔP 1 and 2 (EFAS 1 and 2)
5.	Steam Generator Level	Steam Generator Level - Low Steam Generator ΔP (EFAS)
6.	Core Protection Calculator	Local Power Density - High DNBR - Low
7.	Logarithmic Power	Logarithmic Power Level - High Local Power Density - High (1) DNBR - Low (1) Reactor Coolant Flow - Low (1)

ACTION 3 - With the number of channels OPERABLE one less than the Minimum Channels OPERABLE requirement, STARTUP and/or POWER OPERATION may continue provided the following conditions are satisfied:

a. Verify that one of the inoperable channels has been bypassed and place the other channel in the tripped condition within 1 hour, and

b. All functional units affected by the bypassed/tripped channel shall also be placed in the bypassed/tripped condition as listed below:

	Process Measurement Circuit	Functional Unit Bypassed/Tripped
1.	Linear Power (Subchannel or Linear)	Linear Power Level - High Local Power Density - High DNBR - Low

(1) With the operating bypass enabled.

TABLE 3.3-1 (Continued)

ACTION STATEMENTS

2.	Pressurizer Pressure - High	Pressurizer Pressure - High Local Power Density - High DNBR - Low
3.	Containment Pressure - (RPS) High	Containment Pressure - High Containment Pressure - High (ESF)
4.	Steam Generator Pressure - Low	Steam Generator Pressure - Low Steam Generator ΔP 1 and 2 (EFAS 1 and 2)
5.	Steam Generator Level	Steam Generator Level - Low Steam Generator ΔP (EFAS)
6.	Core Protection Calculator	Local Power Density - High DNBR - Low
7.	Logarithmic Power	Logarithmic Power Level - High Local Power Density - High (1) DNBR - Low (1) Reactor Coolant Flow - Low (1)

STARTUP and/or POWER OPERATION may continue until the performance of the next required CHANNEL FUNCTIONAL TEST. Subsequent STARTUP and/or POWER OPERATION may continue if one channel is restored to OPERABLE status and the provisions of ACTION 2 are satisfied.

ACTION 4 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, suspend all operations involving positive reactivity changes. *

ACTION 5 - With the number of channels OPERABLE one less those required by the Minimum Channels OPERABLE requirement, STARTUP and/or POWER OPERATION may continue provided the reactor trip breakers of the inoperable channel are placed in the tripped condition within 1 hour; otherwise, be in at least HOT STANDBY within 6 hours; however, one channel may be bypassed for up to 1 hour for surveillance testing per Specification 4.3.1.1.

~~ACTION 6 - a. With one CEAC inoperable, operation may continue for up to 7 days provided that at least once per 4 hours, each CEA is verified to be within 7 inches (indicated position) of all other CEAs in its group. After 7 days, operation may continue provided that Actions 6.b.1, 6.b.2, and 6.b.3 are met.~~

* Limited plant cooldown or boron dilution is allowed provided the change is accounted for in the calculated SHUTDOWN MARGIN.

(1) With the operating bypass enabled.

TABLE 3.3-1 (Continued)

ACTION STATEMENTS

b. With both CEACs inoperable, operation may continue provided that:

1. Within 4 hours the DNBR margin required by Specification 3.2.4b (COLSS in service) or 3.2.4d (COLSS out of service) is satisfied and the Reactor Power Cutback System is disabled, and

2. Within 4 hours:

a) All CEA groups are withdrawn to and subsequently maintained at the "Full Out" position, except during surveillance testing pursuant to the requirements of Specification 4.1.3.1.2 or for control when CEA group 6 may be inserted no further than 127.5 inches withdrawn.

b) The "RSPT/CEAC Inoperable" addressable constant in the CPCs is set to the inoperable status.

c) The Control Element Drive Mechanism Control System (CEDMCS) is placed in and subsequently maintained in the "Off" mode except during CEA group 6 motion permitted by a) above, when the CEDMCS may be operated in either the "Manual Group" or "Manual Individual" mode.

3. At least once per 4 hours, all CEAs are verified fully withdrawn except during surveillance testing pursuant to Specification 4.1.3.1.2 or during insertion of CEA group 6 as permitted by 2.a) above, then verify at least once per 4 hours that the inserted CEAs are aligned within 7 inches (indicated position) of all other CEAs in its group.

ACTION 6 - Separate Actions may be entered for each CPC channel.

a. With one CEAC inoperable in 1 or 2 CPC channels, either declare the associated CPC channel(s) inoperable; or set the "RSPT/CEAC Inoperable" addressable constant to the inoperable status within 4 hours.

b. With one CEAC inoperable in 3 or 4 CPC channels, either declare the associated CPC channel inoperable; or, operation may continue provided that:

1. Within 4 hours the "RSPT/CEAC Inoperable" addressable constant(s) is set to the inoperable status.

2. Operation may continue for up to 7 days provided that at least once per 4 hours, each CEA is verified to be within 7 inches (indicated position) of all other CEAs in its group.

3. Operation may continue after 7 days provided that Actions 6.c.1, 6.c.2, and 6.c.3 are met

c. With both CEACS inoperable in a CPC channel, either declare the associated CPC channel inoperable; or, operation may continue provided that:

1. Within 4 hours the DNBR margin required by Specification 3.2.4b (COLSS in service) or 3.2.4d (COLSS out of service) is satisfied and the Reactor Power Cutback System is disabled, and

2. Within 4 hours:

a) All CEA groups are withdrawn to and subsequently maintained at the "Full Out" position, except during surveillance testing pursuant to the requirements of Specification 4.1.3.1.2 or for control when CEA group 6 may be inserted no further than 127.5 inches withdrawn.

b) The "RSPT/CEAC Inoperable" addressable constant in the CPCs is set to the inoperable status.

c) The Control Element Drive Mechanism Control System (CEDMCS) is placed in and subsequently maintained in the "Off" mode except during CEA group 6 motion permitted by a) above, when the CEDMCS may be operated in either the "Manual Group" or "Manual Individual" mode.

3. At least once per 4 hours, all CEAs are verified fully withdrawn except during surveillance testing pursuant to Specification 4.1.3.1.2 or during insertion of CEA group 6 as permitted by 2.a) above, then verify at least once per 4 hours that the inserted CEAs are aligned within 7 inches (indicated position) of all other CEAs in its group.

ACTION 7 - ~~With three or more auto restarts of one non-bypassed calculator during a 12-hour interval, demonstrate calculator OPERABILITY by performing a CHANNEL FUNCTIONAL TEST within the next 24 hours.~~ DELETED

ACTION 8 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement restore the inoperable channel to OPERABLE status within 48 hours or open the reactor trip breakers within the next hour.

TABLE 3.3.2 has been deleted.

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Version 1 - With Strikeouts

TABLE 4.3-1

REACTOR PROTECTIVE INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
1. Manual Reactor Trip	N.A.	N.A.	SFCP and S/U(1)	1, 2, 3*, 4*, 5*
2. Linear Power Level - High	SFCP	SFCP(2,4),SFCP (3,4), SFCP (4)	SFCP	1, 2
3. Logarithmic Power Level - High	SFCP	SFCP(4)	SFCP and S/U(1)	2#, 3, 4, 5
4. Pressurizer Pressure - High	SFCP	SFCP	SFCP	1, 2
5. Pressurizer Pressure - Low	SFCP	SFCP	SFCP	1, 2
6. Containment Pressure - High	SFCP	SFCP	SFCP	1, 2
7. Steam Generator Pressure - Low	SFCP	SFCP	SFCP	1, 2
8. Steam Generator Level - Low	SFCP	SFCP	SFCP	1, 2
9. Core Protection Calculators	SFCP	SFCP(2,4),SFCP(4,5)	None	1, 2
~~9.~~ a. Local Power Density - High	SFCP	SFCP(2,4),SFCP(4,5)	~~SFCP, SFCP(6)~~ None	1, 2
~~10~~ b. DNBR - Low	SFCP	SFCP(7), SFCP(2,4), SFCP(8), SFCP(4,5)	~~SFCP, SFCP(6)~~ None	1, 2
c. CEA Calculators	SFCP	SFCP	None	1,2
10. DELETED				
11. DELETED				
12. Reactor Protection System Logic	N.A.	N.A.	SFCP(11) and S/U(1)	1, 2, 3*, 4*, 5*

TABLE 4.3-1 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
13. Reactor Trip Breakers	N.A.	N.A.	SFCP(10,11), S/U(1)	1, 2, 3*, 4*, 5*
14. ~~Core Protection Calculators~~ DELETED	~~SFCP~~	~~SFCP(2,4), SFCP(4,5)~~	~~SFCP(9), SFCP(6)~~	~~1,2~~
15. ~~CEA Calculators~~ DELETED	~~SFCP~~	~~SFCP~~	~~SFCP, SFCP(6)~~	~~1, 2~~
16. Reactor Coolant Flow - Low	SFCP	SFCP	SFCP	1, 2

TABLE 4.3-1

REACTOR PROTECTIVE INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
1. Manual Reactor Trip	N.A.	N.A.	SFCP and S/U(1)	1, 2, 3*, 4*, 5*
2. Linear Power Level - High	SFCP	SFCP(2,4),SFCP (3,4), SFCP (4)	SFCP	1, 2
3. Logarithmic Power Level - High	SFCP	SFCP(4)	SFCP and S/U(1)	2#, 3, 4, 5
4. Pressurizer Pressure - High	SFCP	SFCP	SFCP	1, 2
5. Pressurizer Pressure - Low	SFCP	SFCP	SFCP	1, 2
6. Containment Pressure - High	SFCP	SFCP	SFCP	1, 2
7. Steam Generator Pressure - Low	SFCP	SFCP	SFCP	1, 2
8. Steam Generator Level - Low	SFCP	SFCP	SFCP	1, 2
9. Core Protection Calculators	SFCP	SFCP(2,4),SFCP(4,5)	None	1, 2
~~9.~~ a. Local Power Density - High	SFCP	SFCP(2,4),SFCP(4,5)	None	1, 2
~~10~~ b. DNBR - Low	SFCP	SFCP(7), SFCP(2,4), SFCP(8), SFCP(4,5)	None	1, 2
c. CEA Calculators	SFCP	SFCP	None	1,2
10. DELETED				
11. DELETED				
12. Reactor Protection System Logic	N.A.	N.A.	SFCP(11) and S/U(1)	1, 2, 3*, 4*, 5*

TABLE 4.3-1 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
13. Reactor Trip Breakers	N.A.	N.A.	SFCP(10,11), S/U(1)	1, 2, 3*, 4*, 5*
14. DELETED				
15. DELETED				
16. Reactor Coolant Flow - Low	SFCP	SFCP	SFCP	1, 2

TABLE 4.3-1 (Continued)

TABLE NOTATIONS

*With the reactor trip breakers in the closed position, the CEA drive system capable of CEA withdrawal, and fuel in the reactor vessel.

#The provisions of Specification 4.0.4 are not applicable when reducing reactor power to less than 10^{-4}% of RATED THERMAL POWER[(a)] from a reactor power level greater than 10^{-4}% of RATED THERMAL POWER[(a)]. Upon reducing power below 10^{-4}% of RATED THERMAL POWER[(a)], a CHANNEL FUNCTIONAL TEST shall be performed within 2 hours if not performed during the previous 31 days. This requirement does not apply with the reactor trip breakers open.

(1) Each startup or when required with the reactor trip breakers closed and the CEA drive system capable of rod withdrawal, if not performed in the previous 7 days.

(2) Heat balance only (CHANNEL FUNCTIONAL TEST not included):

a. No adjustments to RPS Linear Power or CPC power indications are required below 15% of RATED THERMAL POWER.

b. Between 15% and 80% of RATED THERMAL POWER, compare the RPS Linear Power, CPC ΔT power, and CPC neutron flux power indications to calorimetric power and take the following actions as applicable:

If RPS Linear Power or either CPC power indication is within -0.5% to +10% of RATED THERMAL POWER of calorimetric power, then do not calibrate the affected indication except as required during the initial power ascension following refueling.

If RPS Linear Power or either CPC power indication is less than calorimetric power by more than 0.5% of RATED THERMAL POWER, then calibrate the affected indication as close as practical to calorimetric power and within -0.5% to +10% of RATED THERMAL POWER of calorimetric power.

If the RPS Linear Power indication is greater than calorimetric power by more than 10% of RATED THERMAL POWER, then calibrate it such that it is within 0% to 10% of RATED THERMAL POWER greater than calorimetric power.

If either the CPC ΔT power or the CPC neutron flux power indication is greater than calorimetric power by more than 10% of RATED THERMAL POWER, then calibrate the affected CPC power indication such that it is 8% to 10% of RATED THERMAL POWER greater than calorimetric power.

c. At or above 80% of RATED THERMAL POWER, compare the RPS Linear Power, CPC ΔT power, and CPC neutron flux power indications to calorimetric power. If any indication is not within ±2% of RATED THERMAL POWER of calorimetric power, then calibrate the affected indication as close as practical to calorimetric power but within -0.5% to +2% of RATED THERMAL POWER of calorimetric power.

During PHYSICS TESTS, these daily calibrations may be suspended provided these calibrations are performed upon reaching each major test power plateau and prior to proceeding to the next major test power plateau.

[(a)] As measured by the Logarithmic Power Channels.

TABLE 4.3-1 (Continued)

TABLE NOTATIONS (Continued)

(3) Above 15% of RATED THERMAL POWER, verify that the linear power subchannel gains of the excore detectors are consistent with the values used to establish the shape annealing matrix elements in the Core Protection Calculators.

(4) Neutron detectors may be excluded from CHANNEL CALIBRATION.

(5) After each fuel loading and prior to exceeding 70% of RATED THERMAL POWER, the incore detectors shall be used to determine or verify acceptable values for the shape annealing matrix elements used in the Core Protection Calculators.

(6) ~~This CHANNEL FUNCTIONAL TEST shall include the injection of simulated process signals into the channel as close to the sensors as practicable to verify OPERABILITY including alarm and/or trip functions~~. DELETED

(7) Above 70% of RATED THERMAL POWER, verify that the total RCS flow rate as indicated by each CPC is less than or equal to the actual RCS total flow rate determined by either using the reactor coolant pump differential pressure instrumentation or by calorimetric calculations and if necessary, adjust the CPC addressable constant flow co-efficients such that each CPC indicated flow is less than or equal to the actual flow rate. The flow measurement uncertainty is included in the BERR1 term in the CPC and is equal to or greater than 4%.

(8) Above 70% of RATED THERMAL POWER, verify that the total RCS flow rate as indicated by each CPC is less than or equal to the actual RCS total flow rate determined by calorimetric calculations.

(9) ~~The CHANNEL FUNCTIONAL TEST shall include verification that the correct values of addressable constants are installed in each OPERABLE CPC.~~ DELETED

(10) In accordance with the Surveillance Frequency Control Program and following maintenance or adjustment of the reactor trip breakers, the CHANNEL FUNCTIONAL TEST shall include independent verification of the undervoltage trip function and the shunt trip function.

(11) The CHANNEL FUNCTIONAL TEST shall be scheduled and performed such that the Reactor Trip Breakers (RTBs) are tested at least every 6 weeks to accommodate the appropriate vendor recommended interval for cycling of each RTB

6.6 NOT USED

6.7 NOT USED

6.8 PROCEDURES AND PROGRAMS

6.8.1 Written procedures shall be established, implemented and maintained covering the activities referenced below:

a. The applicable procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978 and Emergency Operating Procedures required to implement the requirements of NUREG-0737 and NUREG-0737, Supplement 1, as stated in Generic Letter 82-33.
b. Refueling operations.
c. Surveillance and test activities of safety-related equipment.
d. Not used.
e. Not used.
f. Not used.
g. Modification of Core Protection Calculator (CPC) Addressable Constants, including independent verification of modified constants.

NOTES:
(1) Modification to the CPC addressable constants based on information obtained through the Plant Computer - CPC data link shall not be made without prior approval of the On-Site Safety Review Committee.

(2) Modifications to the CPC software (including algorithm changes and changes in fuel cycle specific data) shall be performed in accordance with the most recent version of ~~CEN-39(A)-P, "CPC Protection Algorithm Software Change Procedure,"~~ that has been determined to be applicable to the facility. Additions or deletions to CPC Addressable Constants or changes to Addressable Constant software limits values shall not be implemented without prior NRC approval.

h. Administrative procedures implementing the overtime guidelines of Specification 6.2.2e., including provisions for documentation of deviations.

i. PROCESS CONTROL PROGRAM implementation.

WCAP-16096-P-A, "Software Program Manual for Common Q ™ Systems,"

SUBJECT: SUMMARY OF MARCH 19, 2020, CATEGORY 1 PUBLIC MEETING WITH ENTERGY OPERATIONS, INC. REGARDING A PLANNED LICENSE AMENDMENT REQUEST TO INSTALL DIGITAL SYSTEMS IN ACCORDANCE WITH DIGITAL INSTRUMENTATION AND CONTROL INTERIM STAFF GUIDANCE (DI&C ISG)-06 REVISION 2, "LICENSING PROCESSES" (EPID L-2020-LRM-0016) DATED APRIL 23, 2020

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