



Entergy Operations, Inc.  
17265 River Road  
Killona, LA 70057-3093  
Tel 504-464-3786

**Paul Wood**  
Manager, Regulatory Assurance  
Waterford 3

W3F1-2019-0068

September 12, 2019

ATTN: Document Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

Subject: Transmittal of Slides for Presubmittal Public Meeting to Discuss a Planned License Amendment Request for Digital Instrumentation and Control Modification

Waterford Steam Electric Station, Unit 3  
NRC Docket No. 50-382  
Renewed Facility Operating License No. NPF-38

Reference: Meeting Notice, "Partially Closed Presubmittal Meeting with Entergy Operations, Inc. to Discuss a Planned License Amendment Request for Digital Instrumentation and Control Modification at Waterford Steam Electric Station, Unit 3 (EPID L-2019-LRM-0056)," (ADAMS Accession No. ML19248C414), dated September 5, 2019

A partially closed meeting between Entergy Operations, Inc. (Entergy) and the U.S. Nuclear Regulatory Commission (NRC) staff is scheduled for September 19, 2019. The purpose of this meeting is to discuss a planned license amendment request to replace the Waterford 3 Core Protection Calculator and Control Element Assembly Calculator Systems in accordance with Digital Instrumentation and Control (DI&C) Interim Staff Guidance (ISG) DI&C-ISG-06, Revision 2.

Attached to this letter are:

- Presubmittal Meeting Slides, "Waterford Unit 3 CPC/CEAC Replacement License Amendment Request NRC Presubmittal Meeting" [includes Westinghouse document WAAP-11511-NP, "Pre-submittal Meeting – Closed Portion," (Non Proprietary)] (Attachment 1).

- Westinghouse Letter CAW-19-4940, Affidavit, Proprietary Information Notice, and Copyright Notice (Attachment 2).
- Presubmittal Meeting Slides, "Waterford Unit 3 CPC/CEAC Replacement License Amendment Request NRC Presubmittal Meeting" [includes Westinghouse document WAAP-11511-P, "Pre-submittal Meeting – Closed Portion," (Proprietary)] (Attachment 3).

As Attachment 3 contains information proprietary to Westinghouse Electric Company LLC ("Westinghouse"), it is supported by an Affidavit signed by Westinghouse, the owner of the information. The Affidavit sets forth the basis on which the information may be withheld from public disclosure by the Nuclear Regulatory Commission ("Commission") and addresses with specificity the considerations listed in paragraph (b)(4) of Section 2.390 of the Commission's regulations.

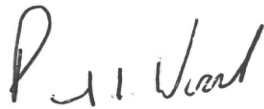
Accordingly, it is respectfully requested that the information which is proprietary to Westinghouse be withheld from public disclosure in accordance with 10 CFR Section 2.390 of the Commission's regulations.

Correspondence with respect to the copyright or proprietary aspects of the items listed above or the supporting Westinghouse Affidavit should reference CAW-19-4940 and should be addressed to Camille T. Zozula, Manager, Infrastructure & Facilities Licensing, Westinghouse Electric Company, 1000 Westinghouse Drive, Suite 165, Cranberry Township, Pennsylvania 16066.

This letter contains no new regulatory commitments.

If you have any questions or require additional information, please contact the Regulatory Assurance Manager, Paul Wood, at (504) 464-3786.

Respectfully,

A handwritten signature in black ink that reads "Paul Wood". The signature is written in a cursive style with a large initial "P" and "W".

Paul Wood

PW/mmz

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Page 3 of 3

- Attachments:
1. Waterford Unit 3 CPC/CEAC Replacement License Amendment Request Presubmittal Meeting Slides (Non-Proprietary)
  2. Westinghouse Letter CAW-19-4940
  3. Waterford Unit 3 CPC/CEAC Replacement License Amendment Request Presubmittal Meeting Slides (Proprietary)

cc: NRC Region IV Regional Administrator  
NRC Senior Resident Inspector – Waterford 3  
NRC Project Manager - Waterford 3

**Attachment 1**

**W3F1-2019-0068**

**Waterford Unit 3 CPC/CEAC Replacement License Amendment Request  
Presubmittal Meeting Slides (Non-Proprietary)**

**Waterford Unit 3  
CPC/CEAC Replacement  
License Amendment Request  
NRC Pre-submittal Meeting**

**September 19, 2019**



## Entergy Waterford Unit 3

- Ron Gaston, Director Fleet Regulatory Assurance
- Stephenie Pyle, Senior Manager, Fleet Regulatory Assurance
- Paul Wood, Manager, Regulatory Assurance
- Janice Cruz, Manager, Major Fleet Projects – Engineering
- Christopher Talazac, Supervisor, Major Fleet Projects – Engineering
- Keith Perkins, Project Manager, CPC Replacement Project
- John Schrage, Senior Staff Engineer - Corporate Licensing
- Roger Rucker, Lead Responsible Engineer, Major Fleet Projects - Engineering
- Pareez Golub, SME, Major Fleet Projects – Engineering
- Alan Harris, Site Regulatory Assurance
- David Constance, Assistant Operations Manager

# Participants

## Westinghouse

- Tyler Morrissette, Primary Project Manager
- Warren Odess-Gillett, Licensing Lead
- Nicole Kurant, Project Technical Lead
- Matthew Shakun, Licensing Engineer
- Allen Denyer, Project Technical Advisor

# Agenda – Open Portion

- ✓ Pre-application Meeting Purpose
- ✓ Needs/Benefits
- ✓ Project milestones
- ✓ NRC Fee Waiver
- ✓ Core Protection Calculator (CPC) / Control Element Assembly Calculator (CEAC) System Overview
  - ✓ Functional Architecture
  - ✓ Physical Architecture



# Agenda – Open Portion

- ✓ Planned Digital Upgrade Overview
  - ✓ Plant photos
  - ✓ Functional Architecture
  - ✓ Physical Architecture
- ✓ Common Q Topical Report and SPM Applicability
- ✓ Technical Specification Impacts
- ✓ Electronic Reading Room
- ✓ NRC topics of interest
- ✓ Vendor Oversight Plan
- ✓ Acronym List

# Agenda – Closed Portion

- ✓ Applicability of Palo Verde's CPC LAR
- ✓ High Level System Design Concept
  - ✓ Conceptual Design
  - ✓ Redundancy
  - ✓ Independence
  - ✓ Deterministic Behavior
  - ✓ Defense in Depth and Diversity (D3)
- ✓ Conclusions and Action Items

# ***Pre-submittal Meeting – Open Portion***

# Pre-Application Meeting Purpose

- ✓ Engage with NRC Staff prior to LAR submittal and describe the WF3 CPC/CEAC digital upgrade
- ✓ Present the design concept and demonstrate how it addresses NRC requirements and policy regarding key issues
- ✓ Provide an overview of LAR content
- ✓ Gain alignment on use of ISG-06 Alternate Review process and submittal/review process
- ✓ Solicit Staff feedback prior to LAR submittal to facilitate a more efficient NRC review
- ✓ Provide justification for a fee waiver

# Needs / Benefits

## Needs:

- ✓ Address long-term obsolescence issues,
- ✓ Upgrade existing digital system to provide increased reliability, and
- ✓ Reduce maintenance work on existing system

# Needs / Benefits

## Benefits:

- ✓ Improvements in Human Machine Interface (HMI),
- ✓ Elimination of CEA Single Point Vulnerabilities (SPV) for the CPC/CEAC,
- ✓ Increased operational flexibility,
- ✓ Enhanced self-diagnostic features, and
- ✓ Highly reliable and accurate system functions

# Project Milestones

- ✓ Pre-submittal meeting #1 9/2019
- ✓ Pre-submittal meeting #2 2/2020
- ✓ LAR Submittal 6/2020
- ✓ Request NRC approval 6/2021
- ✓ System Installation (RF 24) 4/2022

# NRC Fee Waiver

- ✓ Requested fee waiver under 10 CFR 170.11(b)
- ✓ LAR will exercise all portions of the DI&C-ISG-06 R2 Alternate Review Process
- ✓ Learnings from WF3 execution of ARP will be used to support US operating fleet digital protection system modernization efforts
  - ✓ Protection system digitization is a critical element
  - ✓ Economics support Protection system digitization
  - ✓ DI&C-ISG-06 R2 assuaged licensee fears about regulatory certainty



# NRC Fee Waiver

From the August 29, 2019 NRC-Entergy telecon meeting summary, the NRC staff requested that Entergy provide the following:

1. *Similarity of the Waterford 3 design to the previously approved Palo Verde system.*
2. *Level of development and testing of the actual platform by the licensee/vendor at the time of the LAR submittal (this impacts how much it tests our audit and inspection processes).*
3. *The extent that the proposed modification will utilize new, standardized industry digital design guidance.*
4. *The extent that higher-level architecture with software specifications and software development plans, and a new vendor specific oversight plan (i.e., testing DI&C-ISG-06, Revision 2) will be provided in the LAR.*
5. *Potential to request reduction in surveillance requirements and credit self-diagnostics.*

# NRC Fee Waiver

Item 2 - Level of development and testing of the actual platform by the licensee/vendor at the time of the LAR submittal (this impacts how much it tests our audit and inspection processes)

- ✓ CPCS will use approved Common Q modules from Common Q Topical Report (WCAP-16097-P Rev. 4) - possible exceptions:
  - HSL Modems due to obsolescence
  - Power supply due to redesign
- ✓ Application development at time of submittal - items for audit:
  - Software Development Plan
  - V&V Plan
  - Test Plan
  - FMEA
  - SHA
  - Timing Analysis
  - Availability Analysis
  - Heat Load Calculation

# NRC Fee Waiver

- ✓ LAR using portions of EPRI Digital Engineering Guide (DEG) to support industry standard digital design process
- ✓ EPRI DEG and NISP-EN-04, *Standard Digital Engineering Process*, industry implementation date is September 2021

# NRC Fee Waiver

	A R	Tier			Plant-Specific Information Submitted with License Amendment Request (Phase 1 for Tier 1, Tier 2, and Tier 3)
		1	2	3	
1.1	X				(Summary of) Application Software Planning and Processes (see D.4)
1.2	X				(Summary of) Vendor Oversight Plan (see C.2.2)
1.3	X	X	X		Approved Topical Report Safety Evaluation (see D.5)
1.4	X	X	X	X	System Description (see D.1)
1.5	X	X	X	X	System Architecture (see D.2)
1.6	X	X	X	X	(Summary of) Hardware Equipment Qualification (see D.3)
1.7	X	X	X	X	(Unified Compliance/Conformance Matrix for) IEEE Stds 603-1991 and 7-4.3.2-2003 (see D.6)
1.8	X	X	X	X	(Changes to) Technical Specifications (see D.7)
1.9	X	X	X	X	Setpoint Methodology and Calculations (see D.7) Provided when technical specification setpoint methodology changes or calculations deviate from or are not addressed in an applicable referenced NRC-approved topical report
1.10	X	X	X	X	Secure Development and Operational Environment (see D.8)
1.11		X	X	X	Software Requirements Specification (see D.9.1)
1.12		X	X	X	Software Design Specification (see D.9.2)
1.13		X	X	X	Design Analysis Reports for Platform Changes (see D.9.3)
1.14		X	X	X	System Response Time Analysis Report (see D.9.7)
1.15			X	X	Design Report on Computer Integrity, Test and Calibration, and Fault Detection (see D.9.7)
1.16				X	Commercial-Grade Dedication Plan (see D.9.9)
1.17				X	Quality Assurance Plan for Hardware (see D.9.10)
1.18				X	(Summary of) Hardware Development Process (see D.9.10)

DI&C-ISG-06 R2,  
Enclosure B,  
*Information  
Provided in  
Support of a  
License  
Amendment  
Request for a  
Digital  
Instrumentation  
and Control  
Modification*

# NRC Fee Waiver

- ✓ Next pre-submittal meeting:
  - ✓ Provide mapping from DI&C-ISG-06 Enclosure B (and related “To be provided” sections) to LAR content

# **CPCS/CEAC System Description**

***System Overview***

***Physical Architecture***

***Functional Architecture***

***Main Control Room Photos***

# CPC/CEAC System Overview

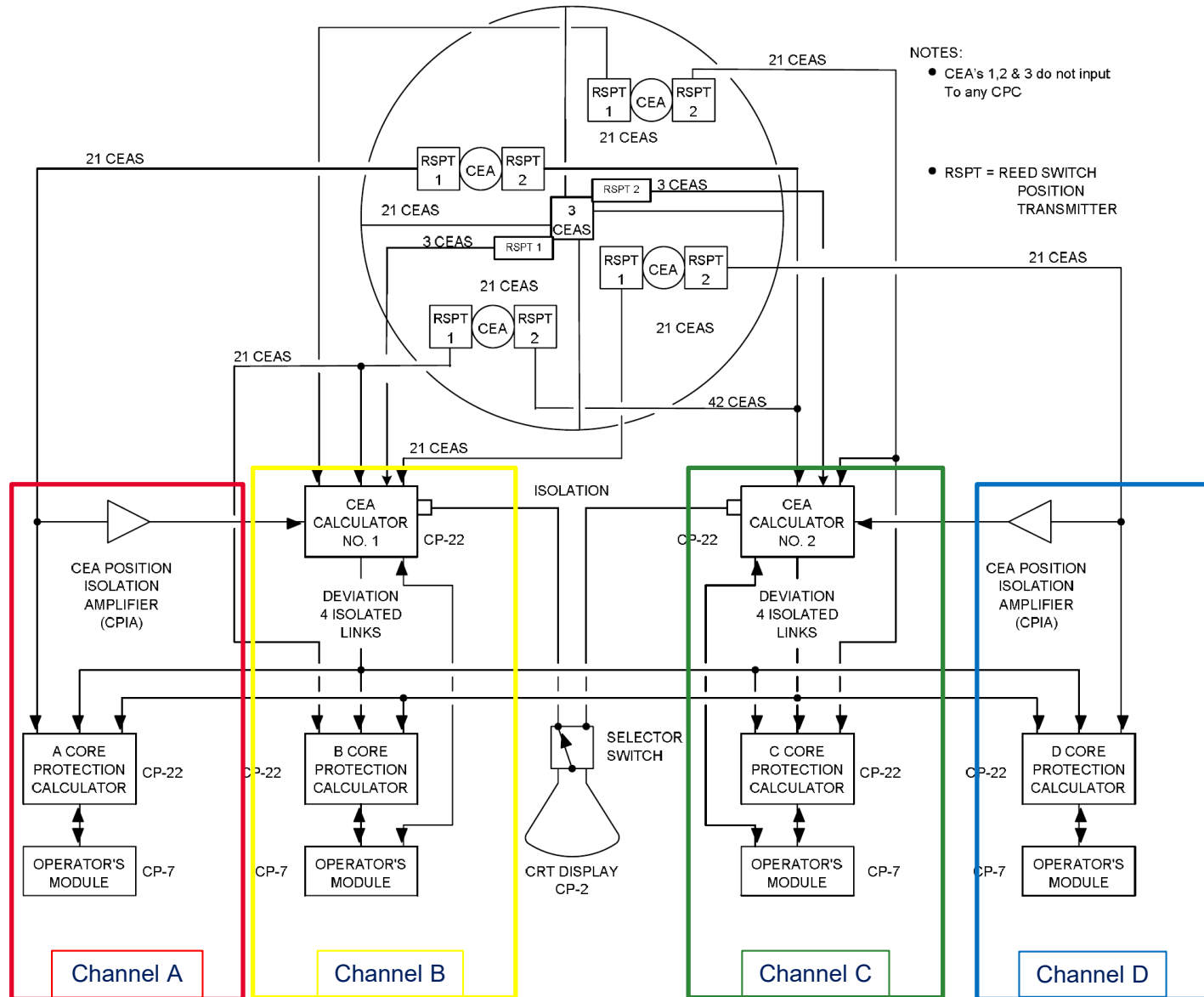
- ✓ WF3 Plant Protection System (PPS) is comprised of an Engineered Safety Features Actuation System (ESFAS) and a Reactor Protection System (RPS)
- ✓ PPS is designed to prevent exceeding any Specified Acceptable Fuel Design Limits (SAFDLs) during any Anticipated Operational Occurrences (AOOs)
- ✓ Core Protection Calculator (CPC) System provide two reactor trip signals in the RPS to assure fuel design limits are not exceeded and aid the ESFAS in limiting consequences of an accident

# CPC/CEAC System Overview

- ✓ The Control Element Assembly Calculators (CEACs) provide the CPCs with information about individual CEA deviations
  - CEACs monitor four CEAs in a subgroup, and send penalty factors to the CPCs if CEAs in a subgroup deviate from each other by more than a set value
  - Each CEAC receives input from its Reed Switch Position Transmitters (RSPT)



# CPC/CEAC System Overview



# CPC/CEAC System – Functional Architecture

- ✓ The CPCs provide the following two trips, to the RPS, to initiate a reactor trip:
  - Low Departure From Nucleate Boiling Ratio (DNBR) trip
  - High Local Power Density (LPD) trip
- ✓ Each trip has a pre-trip MCR alarm

# CPC/CEAC System – Functional Architecture

- ✓ The CPCs provide the following Auxiliary trips, to the RPS, to initiate a reactor trip (no pre-trip alarms):
  - CPC Failure
  - Less than two RCPs running
  - Asymmetrical Steam Generator Trip (ASGT)
  - Variable Overpower Trip (VOPT)
  - $T_{\text{hot}}$  at Saturation
  - Any input parameter outside of CPC operating space
    - Cold Leg temperature
    - primary pressure
    - Radial Peaking Factor (RPF)
    - Axial Shape Index (ASI)

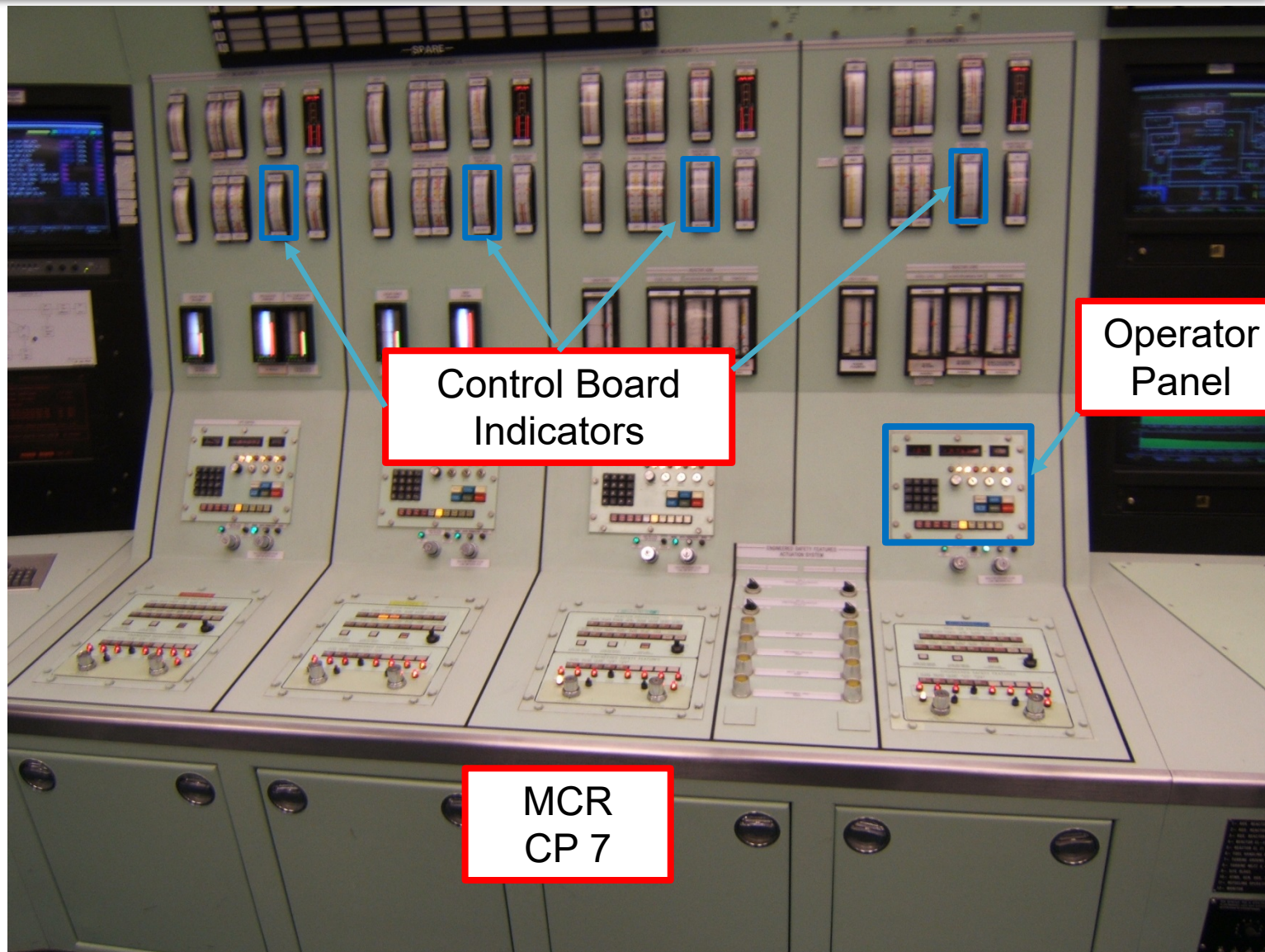
# CPC/CEAC System – Functional Architecture

- ✓ The CPC system initiates a CEA Withdrawal Prohibit (CWP) signal from each CPC channel to its respective PPS channel
- ✓ The CPC system initiates annunciator alarms from the CPC cabinet and via PPS
- ✓ The CPC system provides analog outputs for control room board indicators for Margin to Trip for DNBR and LPD

# CPC/CEAC System – Physical Architecture

- ✓ Existing CPC platform is an Interdata 7/16 Computer System
- ✓ CPC System is comprised of four independent, measurement channels A – D which are electrically and physically separate
- ✓ Four channels of trip signals are generated by the CPC system and provided to the RPS
- ✓ Each channel has one CPC processor module with associated I/O
- ✓ One CEAC each in channels B and C which share signals with channels A and D (two CEACs total)
- ✓ MTP is not part of the current system

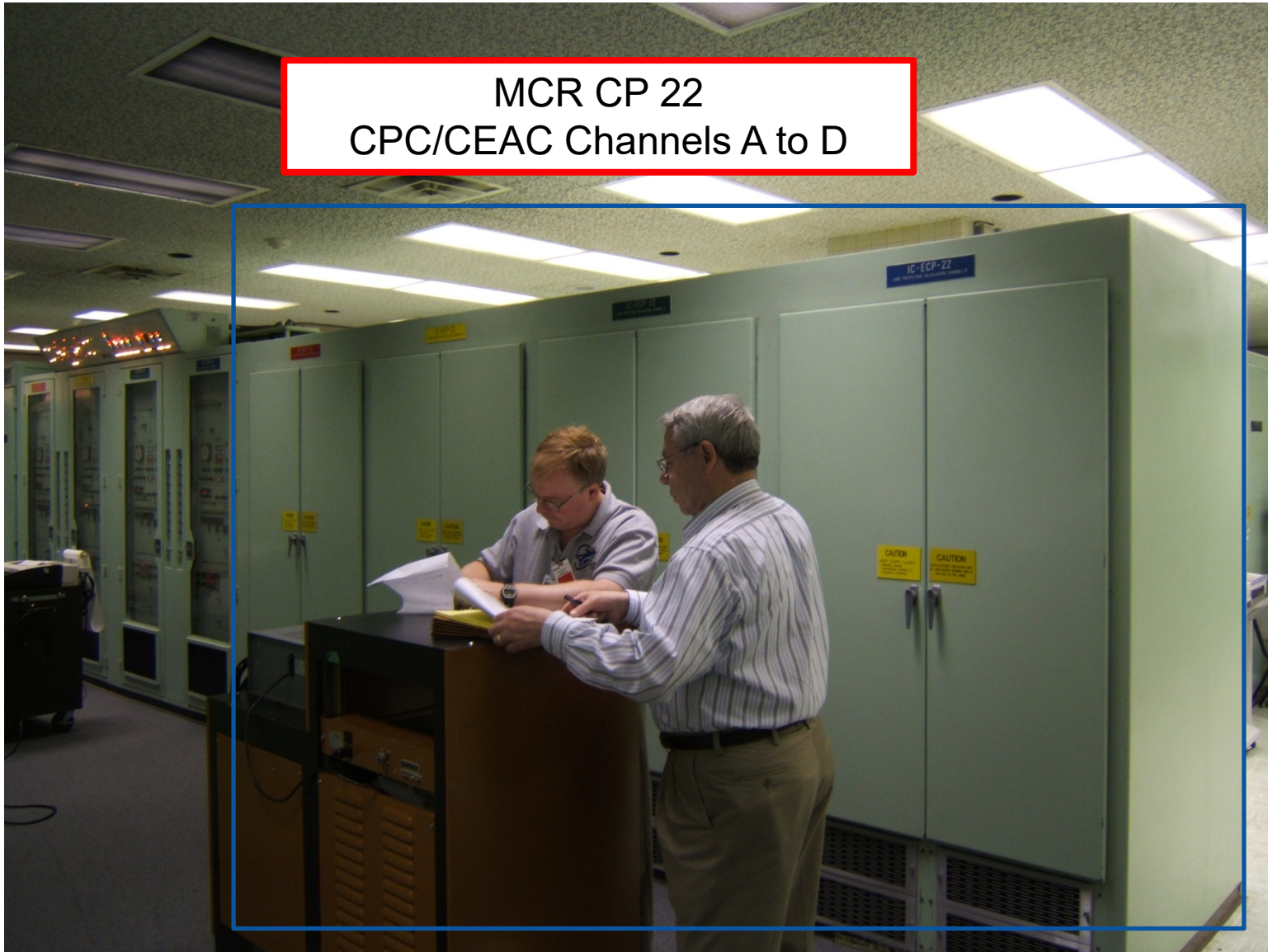
# MCR Photos





# MCR Photos

MCR CP 22  
CPC/CEAC Channels A to D







# **Digital Upgrade Project Description**

**Overview**

**Physical Architecture**

**Functional Architecture**

**Common Q Topical Report and SPM  
Applicability**

**Technical Specification Impact**

# Planned digital upgrade overview

- ✓ Replace the existing Interdata 7/16 Computer System with Westinghouse Common Qualified (Common Q) digital platform for CPC and CEAC functionality
- ✓ Each CPC channel (A-D) will have two CEACs each for eight total CEACs
- ✓ Replace Operator Modules with new touchscreen Flat Panel Displays
- ✓ Each channel has its own MTP

# Digital upgrade – Physical Architecture

- ✓ Increase number of CEACs for each CPC channel (A-D) to have two CEACs each for eight total CEACs in CP 22
- ✓ Replace the Auxiliary Protection Cabinet Multiplexers (APC Mux) for the Fixed Incore Detectors in CP 22 (non-safety, non-Common Q equipment, not part of the LAR)
- ✓ Replace the Operator Modules on CP 7
- ✓ Add the Maintenance Test Panels (MTP) in CP 22
- ✓ Replace the margin indicators on CP 7

# Digital upgrade – Functional Architecture

No design basis changes to the algorithms or functional architecture from the existing CPC system:

- ✓ Initiates two trips in the RPS:
  - ✓ Low Departure From Nucleate Boiling Ratio (DNBR) trip
  - ✓ High Local Power Density (LPD) trip
- ✓ Initiates CEA Withdrawal Prohibit (CWP) signals within the PPS
- ✓ Initiates annunciator alarms
- ✓ Provides analog outputs for control room board indicators for Margin to Trip for DNBR and LPD

CPC algorithm will be changed to add pre-trip signals for the Auxiliary trips

## Common Q Topical Report and SPM Applicability

Like the Palo Verde CPC replacement, the WF3 CPC replacement is based on the Common Q Topical Report and SPM

- ✓ The Common Q SPM, WCAP-16096-P-A, Revision 5 was approved in 2018 and will be referenced in the WF3 CPC Replacement LAR
- ✓ June 26, 2019 – Westinghouse submitted a Revision 4 Common Q Topical Report for NRC review and approval.
  - ✓ Addresses Watchdog Timer description errors documented in Westinghouse NSAL-17-2, Revision 1
  - ✓ Addresses error corrections documented in InfoGram IG-18-01
  - ✓ Currently under NRC review using NRC pilot for expedited review process (i.e., SER issued before end of 2019)
  - ✓ The WF3 CPC Replacement LAR will reference Revision 4

# Technical Specification Impact

TS proposed revisions include:

- ✓ Elimination of auto-restart in legacy system
  - ✓ TS 3/4.2.4, DNBR Margin
  - ✓ TS 3/4.3.1, Reactor Protective Instrumentation
- ✓ Increasing from two CEACs total per four channels to two CEACs per channel (eight CEACs total)
  - ✓ TS 3/4.2.4, DNBR Margin
  - ✓ TS 3/4.3.1, Reactor Protective Instrumentation)
- ✓ Revision of reference to software change procedure
  - ✓ TS 6.8, Procedures and Programs

# ***NRC Topics of Interest***

# IEEE Std. 603 Applicability to the Proposed Change

- Within the scope of the planned modification, the design will conform to IEEE Std. 603 and IEEE Std. 7-4.3.2 per the description in the LAR
- WF3 licensing basis, outside of modification scope, will continue to be IEEE Std. 279



# Human Factors

- ✓ No changes in the method of operations (e.g., manual to automatic actions)
- ✓ New CPC display screens developed with input from Operations
- ✓ Human factors engineering considerations will be applied based on Entergy procedures, industry guidance, and NRC guidance

# Data Communications

The same NRC-approved Common Q AC160 data communications will be used for the WF3 CPC replacement as were used for the NRC-approved Palo Verde CPC replacement

- ✓ Unidirectional High Speed Link (HSL) for cross channel and safety-critical data communication
- ✓ AF100 communication bus for information data exchange within a channel for data display, diagnostic reporting, and channel calibration

# Data Communications (cont.)

IRIG Communication is not described in the Common Q topical report but **is identical** to the NRC-approved Palo Verde CPC replacement

- ✓ IRIG Time Synchronization interface
  - ✓ Aids operating personnel to correlate event data between CPC channels and other systems
  - ✓ MTP is the interface to the IRIG clock signal
  - ✓ AC160 controller does not rely on the real time clock to function in order to execute the safety-related application
  - ✓ LAR includes compliance dispositions to DI&C-ISG-04 and SDOE vulnerability assessment

# Data Communications (cont.)

- ✓ WF3 CPC MTP & OM Ethernet interface will use a unidirectional protocol (Palo Verde CPC uses bidirectional protocol)
- ✓ The change enhances the CPC secure operational environment and is more in line with ISG-04 compliance

# Plant Specific Action Items

The WF3 CPC Replacement LAR will address:

- ✓ Generic Open Items (GOIs) 8 & 11 - GOI 11 may be closed as part of the upcoming Revision 4 SER
- ✓ 24 Plant-Specific Action Items (PSAIs)
  - ✓ Common Q Topical Report
  - ✓ Common Q Software Program Manual
- ✓ The dispositions for these GOIs and PSAIs will be in the LAR addressing DI&C-ISG-06 Revision 2, Section D.5.1.1

## Secure Development Environment (SDE)

- ✓ Westinghouse will use a secure development environment that meets the requirements of an SDE in the NRC-approved Common Q Software Program Manual (SPM), Section 12

## Secure Operational Environment (SOE)

- ✓ LAR will include a vulnerability assessment that correlates vulnerabilities to system requirements that will then be traced to system design, implementation, and test

# EMC Compliance

## Electromagnetic Compatibility (EMC) Requirements

- ✓ Westinghouse will comply with the EMC requirements from the Common Q Topical Report
- ✓ EMC qualification is in accordance with RG 1.180

# EMC Compliance (cont.)

## Equipment Qualification Summary Report (EQSR)

- ✓ An EQSR will be submitted to the NRC that summarizes the equipment qualification (EQ) performed on the Common Q Platform, and provides the analysis that the EQ bounds the site conditions at WF3 for the CPC replacement
- ✓ The EQSR will summarize the EMC qualification identifying any operational constraints to protect the CPC replacement equipment from electromagnetic susceptibilities or to protect other plant equipment from electromagnetic emissions coming from the CPC replacement equipment



## Vendor Oversight Plan (VOP)

- ✓ LAR will include a project-specific VOP description per ISG-06 R2 Section C.2.2.1
- ✓ VOP includes participation by project stakeholders to ensure vendor compliance with their processes, including V&V, requirements traceability, configuration management, testing, software quality assurance, etc.

## Vendor Oversight Plan (VOP)

- ✓ Vendor Oversight activities include the following:
  - ✓ Periodic audits/surveillances (which includes witness of critical testing or V&V activities)
  - ✓ Routine design reviews for technical and process compliance
  - ✓ Critical Procurement Plan execution
  - ✓ Daily project management telecons with WEC
  - ✓ Weekly Engineering and Licensing issues telecons
  - ✓ 2020 NUPIC Mega-audit of WEC

## Vendor Oversight Plan (VOP)

- ✓ First WEC audit performed September 3-5, 2019
- ✓ Audit topics included, in part:
  - ✓ Requirements traceability
  - ✓ Configuration management
  - ✓ Secure Development Environment
  - ✓ Testing
  - ✓ Corrective Action Process
  - ✓ Verification and Validation

# Electronic Reading Room

Entergy will set-up an electronic reading room to facilitate remote access to WEC proprietary documents and other LAR support information.

# Acronym List

Alternate Review Process	ARP
Asymmetrical Steam Generator Trip	ASGT
Auxiliary Multiplexer	Aux MUX
Axial Shape Index	ASI
CEA Withdrawal Prohibit	CWP
Common Cause Failure	CCF
Control Element Assembly	CEA
Control Element Assembly Calculator	CEAC
Control Element Assembly Position Display System	CEAPDS
Control Panel	CP
Core Operating Limit Supervisory System	COLSS
Core Protection Calculator	CPC
Core Protection Calculator System	CPCS
Departure From Nucleate Boiling Ratio	DNBR
Digital Instrumentation and Control	DI&C
Electromagnetic Interference/Radio Frequency Interference	EMI/RFI
Electro-magnetic Compatibility	EMC
Equipment Qualification	EQ
Equipment Qualification Summary Report	EQSR

# Acronym List

Flat Panel Display	FPD
Generic Open Item	GOI
Human Factors Engineering	HFE
Inter-Range Instrument Group	IRIG
Institute of Electrical and Electronics Engineers	IEEE
Interim Staff Guidance	ISG
License Amendment Request	LAR
Local Power Density	LPD
Main Control Room	MCR
Maintenance Test Panel	MTP
Operator Module	OM
Plant Protection System	PPS
Plant Specific Action Item	PSAI
Quality Assurance	QA
Radial Peaking Factor	RPF
Reactor Coolant Pump	RCP
Reactor Protection System	RPS

# Acronym List

Reed Switch Position Transmitter	RSPT
Response Time Test	RTT
Safety Evaluation Report	SER
Secure Development and Operational Environment	SDOE
Secure Development Environment	SDE
Secure Operational Environment	SOE
Single Point Vulnerabilities	SPV
Site Acceptance Test	SAT
Software Program Manual	SPM
Standard	Std.
Technical Specifications	TS
Topical Report	TR
United States Nuclear Regulatory Commission	NRC
Variable Overpower Trip	VOPT
Vendor Oversight Plan	VOP
Waterford Unit 3	WF3
Westinghouse Common Qualified Platform	Common Q
Westinghouse Electric Company	WEC



# *Pre-submittal Meeting – Closed Portion*



# Applicability of Palo Verde's CPC LAR

On October 24, 2003, NRC issued Palo Verde a License Amendment for the CPC Upgrade (ML0330303630)

- ✓ Since then...
  - ✓ The Common Q Topical Report was revised and approved in 2013 (Revision 3) and is currently under review (Revision 4)
  - ✓ The Common Q SPM has been revised and approved twice; the latest – 2018 Revision 5
- ✓ WF3 CPC replacement LAR will be based on the Common Q Topical Report Revision 4 and the Common Q SPM Revision 5.
- ✓ Differences between the Palo Verde CPC replacement and the WF3 CPC replacement are presented in the following slides.

# Applicability of Palo Verde's CPC LAR (cont.)

a,c



# Applicability of Palo Verde's CPC LAR (cont.)

a,c



# Applicability of Palo Verde's CPC LAR (cont.)

a,c



# Applicability of Palo Verde's CPC LAR (cont.)

a,c



# High Level System Design Concept

- ✓ WF3 CPC Replacement Architecture uses the same architecture concepts as the original CPC system and is similar to the NRC-approved Palo Verde CPC replacement.
- ✓ Following slides explain the architecture using the architecture principles outlined in DI&C-ISG-06, Revision 2, D.2.6 “Fundamental Design Principles in the New Architecture”
- ✓ Simplicity is not specifically addressed in this presentation since the same basic architecture is replicated from existing CPC to its replacement. It is also not explicitly addressed because the architecture is now NRC-approved and replicated for WF3.
- ✓ The following 4-channel architecture drawing will be used as a reference when explaining the high level system design concept

# High Level System Design Concept (cont'd)



a,c

# High Level System Design Concept (cont.)

Fundamental I&C Design Principles applied to the design:

- ✓ *Redundancy*
- ✓ *Independence*
- ✓ *Deterministic Behavior*
- ✓ *Defense in Depth and Diversity (D3)*



# High Level System Design Concept (cont.)

## Redundancy



a,c

# High Level System Design Concept (cont.)

## Redundancy



a,c

# High Level System Design Concept (cont.)

## Independence



a,c

# High Level System Design Concept (cont.)

## Deterministic Behavior



a,c

# High Level System Design Concept (cont.)

## Defense in Depth and Diversity (D3)

a,c



***Questions?***

**Attachment 2**

**W3F1-2019-0068**

**Westinghouse Letter CAW-19-4940**

As Attachment 3 contains information proprietary to Westinghouse Electric Company LLC, it is supported by an Affidavit signed by Westinghouse, the owner of the information. The affidavit sets forth the basis on which the information may be withheld from public disclosure by the commission and addresses with specificity the considerations listed in paragraph (b)(4) of Section 2.390 of the Commission's regulations

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

COUNTY OF BUTLER:

- (1) I, Korey L. Hosack, have been specifically delegated and authorized to apply for withholding and execute this Affidavit on behalf of Westinghouse Electric Company LLC (Westinghouse).
- (2) I am requesting the proprietary portions of WAAP-11511-P be withheld from public disclosure under 10 CFR 2.390.
- (3) I have personal knowledge of the criteria and procedures utilized by Westinghouse in designating information as a trade secret, privileged, or as confidential commercial or financial information.
- (4) Pursuant to 10 CFR 2.390, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.
  - (i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Westinghouse and is not customarily disclosed to the public.
  - (ii) Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Westinghouse because it would enhance the ability of competitors to provide similar technical evaluation justifications and licensing defense services for commercial power reactors without commensurate expenses. Also, public disclosure of the information would enable others to use the information to meet NRC requirements for licensing documentation without purchasing the right to use the information.



AFFIDAVIT

- (5) Westinghouse has policies in place to identify proprietary information. Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential competitive advantage, as follows:
- (a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of Westinghouse's competitors without license from Westinghouse constitutes a competitive economic advantage over other companies.
  - (b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage (e.g., by optimization or improved marketability).
  - (c) Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing a similar product.
  - (d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Westinghouse, its customers or suppliers.
  - (e) It reveals aspects of past, present, or future Westinghouse or customer funded development plans and programs of potential commercial value to Westinghouse.
  - (f) It contains patentable ideas, for which patent protection may be desirable.
- (6) The attached documents are bracketed and marked to indicate the bases for withholding. The justification for withholding is indicated in both versions by means of lower case letters (a) through (f) located as a superscript immediately following the brackets enclosing each item of information being identified as proprietary or in the margin opposite such information. These lower case letters

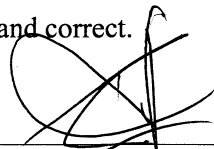
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refer to the types of information Westinghouse customarily holds in confidence identified in Sections (5)(a) through (f) of this Affidavit.

I declare that the averments of fact set forth in this Affidavit are true and correct to the best of my knowledge, information, and belief.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on: 20190909

  
\_\_\_\_\_  
Korey L. Hosack, Manager  
Product Line Regulatory Support

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