Attachment 16

Non-proprietary Westinghouse Electric Company document WNA-PT-00138-WBT-NP, "Post Accident Monitoring System Test Plan," Revision 0

Westinghouse

Westinghouse Non-Proprietary Class 3

Nuclear Automation
Watts Bar 2 NSSS Completion Program
I&C Projects

Post Accident Monitoring System Test Plan

WNA-PT-00138-WBT-NP,
Rev. 0

November 2010

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REVISION HISTORY

RECORD OF CHANGES

Revision	Author	Description	Completed
0	Secil Karaaslan	Initial Release	See EDMS

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OPEN ITEMS

Item	Description	Status
None.		

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ACRONYMS AND TRADEMARKS

Acronyms used in the document are defined in WNA-PS-00016-GEN, "Standard Acronyms and Definitions" (Reference 5), or included below to ensure unambiguous understanding of their use within this document.

Acronym	Definition
AI/AO	Analog Input/Analog Output
CDI	Commercial Dedication Instruction
CHT	Cabinet Hardware Test
CIT	Channel Integration Test
Common Q	Common Qualified Platform
DI/DO	Digital Input/Digital Output
ELM	Engineering Line Manager
ER	Exception Report
EST	Element Software Test
FAT	Factory Acceptance Test
FPDST	Flat Panel Display Software Test
HSL	High Speed Link
I/O	Input/Output
IV&V	Independent Verification and Validation
PAMS	Post Accident Monitoring System
PMST	Processor Module Software Test
RSE	Reusable Software Element
RSED	Reusable Software Element Document
RTA	Requirements Traceability Assessment
RTM	Requirements Traceability Matrix
RVLIS	Reactor Vessel Level Instrumentation System
SAT	Site Acceptance Test
SBC	Single Board Computer
SSEP	Safety, Security, and Emergency
SHT	Subassembly Hardware Test
SIOS	Standard I/O Simulator Application
SIT	System Integration Test

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GLOSSARY OF TERMS

Standard terms used in the document are defined in WNA-PS-00016-GEN, "Standard Acronyms and Definitions" (Reference 5), or included below to ensure unambiguous understanding of their use within this document.

Term	Definition
Acceptance Criteria	A list of results that define success for an activity (i.e., the "goals" of an activity).
Configuration Management	A formal process that controls revisions to configuration items (hardware and software). A configuration management process is the method by which change is introduced to the system in a systematic, controlled fashion so that credit can be taken for work previously performed.
Methodology	A brief description of the manner in which a test activity will be executed (i.e., how the activity will be performed).
Objectives	A list of intentions for a given test activity (i.e., why the activity is performed).
Regression	An activity that analyzes and quantifies the impact of change drivers on configuration items.
Regression Testing	Conducting all or part of previously executed tests after a system modification has been made, the scope of which is determined by the regression process. The intent is to prove the system modification has been implemented correctly, and to ensure that new errors have not been introduced into the system.
Verification & Validation (V&V)	The process of determining whether the requirements for a system or component are complete and correct, that the products of each development phase fulfill the requirements or conditions imposed by the previous phase, and that the final system or component complies with specified requirements (IEEE 610.12). For safety-related systems, V&V and IV&V are used interchangeably.

REFERENCES

Following is a list of references used throughout this document.

1. NABU-DP-00014-GEN, Rev. 2, "Design Process for Common Q Safety Systems," Westinghouse Electric Company LLC.

2. WNA-PV-00009-GEN, Rev. 3, "Verification & Validation Process for the Common Q Safety Systems," Westinghouse Electric Company LLC.

3. WNA-PT-00058-GEN, Rev. 0, "Testing Process for Common Q Safety Systems," Westinghouse Electric Company LLC.

4. NABU-DP-00015-GEN, Rev. 3, "Common Q Software Configuration Management Guidelines," Westinghouse Electric Company LLC.

5. WNA-PS-00016-GEN, Rev. 5, "Standard Acronyms and Definitions," Westinghouse Electric Company LLC.

6. WNA-DS-01617-WBT, Rev. 2, "Watts Bar 2 NSSS Completion Program I&C Projects Post Accident Monitoring System – System Requirements Specification," Westinghouse Electric Company LLC.

7. WNA-DS-01667-WBT, Rev. 2, "Watts Bar 2 NSSS Completion Program I&C Projects Post Accident Monitoring System – System Design Specification," Westinghouse Electric Company LLC.

8. WNA-SD-00239-WBT, Rev. 2 "Watts Bar 2 NSSS Completion Program I&C Projects Software Requirements Specification for the Post Accident Monitoring System," Westinghouse Electric Company LLC.

9. WCAP-16096-NP, Rev. 1A, "Software Program Manual for Common Q Systems," Westinghouse Electric Company LLC.

10. RRAS Automation Level 3 Procedure NA 4.37, "Configuration Management," Rev 1, Westinghouse Electric Company LLC, Effective 20 April 2009.

11. WNA-SQ-00047-GEN, Rev. 0, "Standard Integrated Instrumentation and Control Validation and Test Strategy," Westinghouse Electric Company LLC.

12. RRAS Automation Level 3 Procedure NA 11.0.4, Rev 4, "Test Results," Westinghouse Electric Company LLC, Effective May 2010.

13. RRAS Automation Level 3 Procedure NA 11.0.3, Rev 3, "Test Configuration," Westinghouse Electric Company LLC, Effective May 2010.

REFERENCES (cont.)

14. WNA-VR-00284-GEN, Rev. 0, "Common Q Generic FPDS IV&V Summary Report," Westinghouse Electric Company LLC.

15. RRAS Automation Level 3 Procedure NA 4.32, Rev. 1, "Requirements Management and Traceability," Westinghouse Electric Company LLC, effective April 20, 2009.

16. Regulatory Guide 1.171, "Software Unit Testing for Digital Computer Software used in Safety Systems of Nuclear Power Plants," U.S. Nuclear Regulatory Commission, Revision 0, September 1997.

17. Regulatory Guide 1.170, "Software Test Documentation for Digital Computer Software used in Safety Systems of Nuclear Power Plants," U.S. Nuclear Regulatory Commission, Revision 0, September 1997.

18. WNA-PD-00073-WBT, Rev. 0, "Project Plan Common Q Post Accident Monitoring System," Westinghouse Electric Company LLC.

19. 00000-ICE-30156, Rev. 7, "System Requirements Specification for the Common Q PAMS," Westinghouse Electric Company LLC.

20. 00000-ICE-37744, Rev. 2, "Module Test Report for the CET_MON Custom PC Element for the Common Q Post Accident Monitoring System," Westinghouse Electric Company LLC.

21. 00000-ICE-37745, Rev. 2, "Module Test Report for the SM_MON Custom PC Element for the Common Q Post Accident Monitoring System," Westinghouse Electric Company LLC.

22. 00000-ICE-37366, Rev. 7, "Module Test Report for the Common Q Core Protection Calculator," Westinghouse Electric Company LLC.

23. 00000-ICE-37742, Rev. 0, "Module Test Report for the Sys_Time Custom PC Element for the Common Q Post Accident Monitoring System," Westinghouse Electric Company LLC.

24. WNA-RL-00530-GEN, Rev. 0V, "Software Release Record for the STDADD05 AC160 Library," Westinghouse Electric Company LLC.

25. RRAS Automation Level 3 Procedure NA 11.0.2, Rev 2, "Test Procedures," Westinghouse Electric Company LLC, Effective May 2010.

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SECTION 1
INTRODUCTION

1.1 OVERVIEW

This document provides the project-specific approach that complies with the established Common Q testing process, WNA-PT-00058-GEN, (Reference 3) which supplements WCAP-16096- P, Rev. 1, "Software Program Manual for Common Q Systems" (Reference 9). This Test Plan is a companion to WNA-PV-00009-GEN, "Verification & Validation Process for the Common Q Safety Systems" (Reference 2). It establishes the test program to be performed on the Watts Bar Unit 2 Post Accident Monitoring System (PAMS), as required by the verification and validation (V&V) process. This plan defines how and when (in terms of sequence) specific hardware, software, and integration test activities are to be performed. The documentation produced as a result of these test activities is also identified in this plan. This Test Plan conforms to the guidance provided in Regulatory Guide 1.171, "Software Unit Testing for Digital Computer Software used in Safety Systems of Nuclear Power Plants" (Reference 16) and Regulatory Guide 1.170, "Software Test Documentation for Digital Computer Software used in Safety Systems of Nuclear Power Plants" (Reference 17).

Testing is used to demonstrate that the system has been designed and implemented correctly, that it performs the required functions within the specified performance envelope, and does not exhibit any undesirable behaviors or side effects.

Effective testing is organized in a bottom up strategy; first testing individual assemblies, then testing interconnected assemblies that form subsystems or cabinets, and finally interconnecting systems to verify interfaces and performance.

The primary function of the Watts Bar Unit 2 PAMS is to monitor reactor vessel level, sub-cooled margin and core exit thermocouple temperatures. The Watts Bar Unit 2 PAMS is based on the Westinghouse Common Q PAMS standard design.

1.2 SCOPE

Independent verification and validation (IV&V) activities include independent V&V reviews, analysis, inspections, and tests (see Reference 2). This document addresses the factory testing (module testing, unit testing, integration testing/factory acceptance testing [FAT]) of the PAMS and does not specifically address tests associated with equipment qualification.

The Watts Bar Unit 2 is based on the Westinghouse Common Q PAMS standard design. The standard Common Q PAMS is described in 00000-ICE-30156, "System Requirements Specification for the Common Q PAMS" (Reference 19). The Common Q PAMS comprises a single cabinet; therefore, the System Integration Test (SIT), identified as one of the integration level tests in Reference 3, is not applicable to this Test Plan.

Flat Panel Display Software Test (FPDST) supplements the Channel Integration Test (CIT) and validates the FPDS application software for the MTP and OM subsystems.

Based on agreement with, and for clear communication with, the customer, CIT is equivalent to the FAT for purposes of this Test Plan.

Qualification of generic software elements and platforms are also excluded from this plan; however, how the generic qualification is credited for the project-specific verification is described where applicable.

Cyber Security related tests as required by the Contract are outside the scope of this Test Plan.

Administrative software used for purposes such as ordering, scheduling, and project management is excluded from the scope of this document. Commercial applications software for use in database management systems, word processing, and commercially purchased computer-aided design (CAD) systems such as Excel®, Word, and AutoCAD® are also excluded. Testing of tools utilized during execution of the test program is outside the scope of this plan.

1.3 OBJECTIVE

This document defines the Watts Bar Unit 2 PAMS test plan for the Westinghouse deliverable equipment. This plan provides the framework from which test procedures can be written, executed, and results reported to demonstrate that the equipment functions as required and designed.

The objective of this plan is to specify testing activities specific to the Watts Bar Unit 2 PAMS and to document the scope and approach utilized for this testing. It identifies the test items, the functions to be tested, and the tasks associated with this testing.

The information presented in this document provides the basis for the project-specific testing program.

1.4 REQUIREMENTS REFERENCES

The following documents provide the requirements to be satisfied in the PAMS test suite:

- WNA-DS-01617-WBT, "Watts Bar 2 NSSS Completion Program I&C Projects Post Accident Monitoring System – System Requirements Specification" (Reference 6).

- WNA-DS-01667-WBT, "Nuclear Automation Watts Bar 2 NSSS Completion Program I&C Projects Post Accident Monitoring System – System Design Specification" (Reference 7).

- WNA-SD-00239-WBT, "Watts Bar 2 NSSS Completion Program I&C Projects Software Requirements Specification for the Post Accident Monitoring System" (Reference 8).

As this Test Plan covers the life-cycle of the design process, it is expected that the three aforementioned documents will be revised throughout the project lifecycle. Therefore the applicable revision will be referenced in the appropriate phase summary report.

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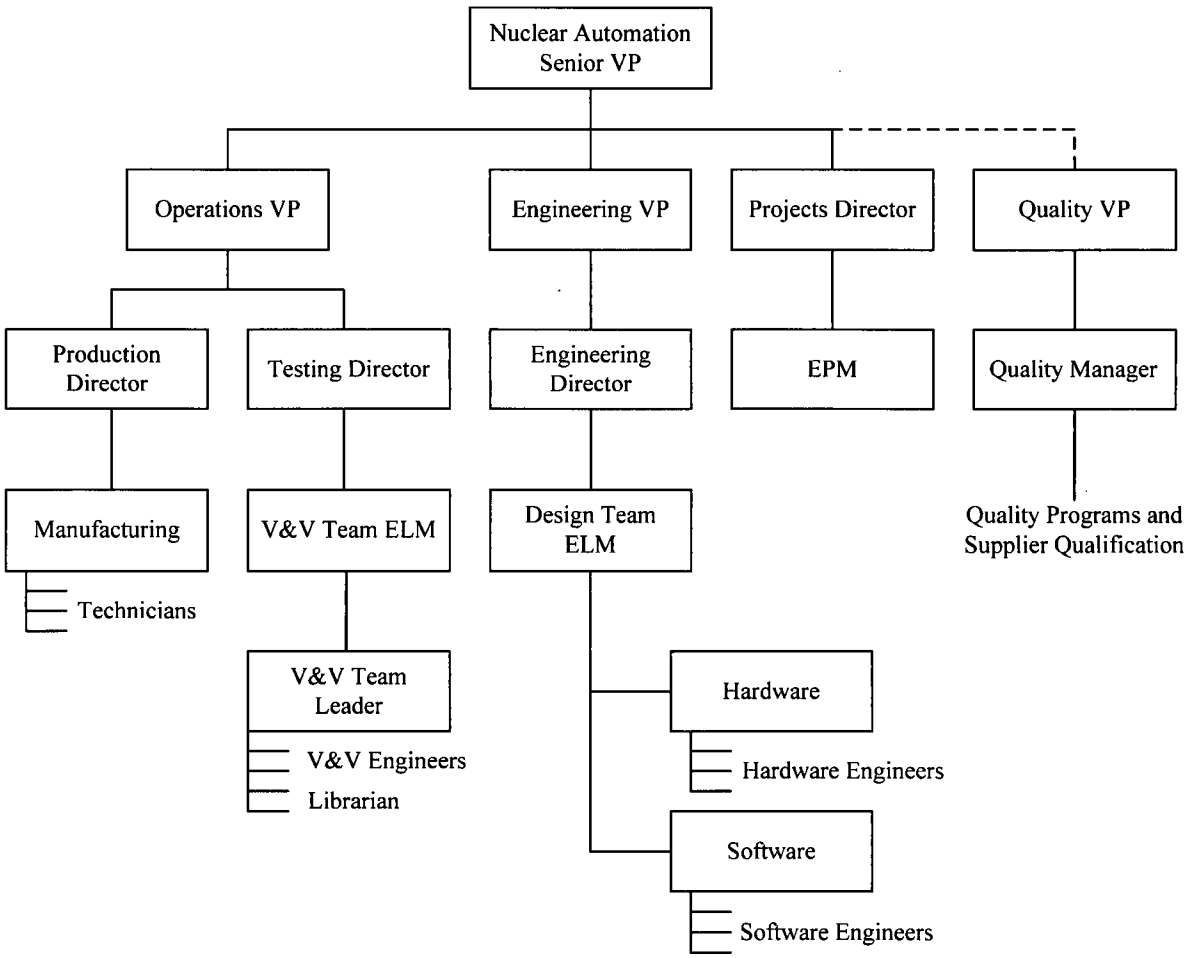
SECTION 2
TESTING PROCESS OVERVIEW

2.1 ORGANIZATION

The IV&V organization shall have overall responsibility for the testing program. The IV&V team is organized independently of the design team per requirements of IEEE-7-3.2.1. Within Nuclear Automation, the administrative and financial independence is complied with by the reporting structure shown below.



2.2 STAFFING AND TRAINING

This section describes the general duties and qualifications for the IV&V test team, which is made up of members assigned to the IV&V team to perform testing functions (preparing plans, procedures, and reports, and conducting tests) under supervision of the IV&V team leader.

The IV&V test team may contain individuals who are not reporting to V&V Team Engineering Line Manager (ELM), yet still technically independent from the design team. Test program artifacts developed

by those individuals require an additional reviewer from within the IV&V Group and approval by the IV&V Team ELM to maintain supervision, except for those testing activities that are purely hardware related (e.g., CHT).

2.2.1 Duties

IV&V team leader, assigned to the project, is responsible for all technical matters concerning system verification including test activities. The IV&V team leader has responsibility for compliance with the IV&V program.

The IV&V engineer(s) works under supervision of the IV&V team leader.

Engineering staff assignment to the IV&V team shall be based on technical field of experience and current work assignments.

Any given test procedure shall be prepared by an individual other than the individual who participated in the design of the hardware/software component that is to be tested by that procedure.

2.2.2 Qualifications

The individuals that are assigned to the IV&V test team shall not have been involved with the design or implementation of the system that they participate in testing.

IV&V test team members must be trained in the current applicable Westinghouse Level II and RRAS Level III policies and procedures. IV&V test team members shall receive any Watts Bar Unit 2 PAMS project-specific training as required per WNA-PD-00073-WBT, "Project Plan Common Q Post Accident Monitoring System" (Reference 18). All training shall be documented, and the training records shall be maintained by the appropriate line manager.

Designated IV&V test team members shall be adequately trained on the software testing tools that may be utilized during the testing process.

2.3 RESPONSIBILITIES

IV&V shall be responsible for development of the IV&V program and all formal testing. IV&V will assume the lead verification and validation functions and be responsible for all technical matters concerning system verification and validation. The IV&V team leader shall inform the Design Team of IV&V status and request documented resolution of IV&V issues.

Proper qualification of the IV&V team members is the responsibility of the IV&V Manager.

The IV&V test team is responsible for execution of this Test Plan. Specifically:

- Preparation, execution, and reporting of Element Software Test (EST) for generic qualification of reusable software element libraries that are to be used by the Watts Bar Unit 2 Common Q PAMS project.

- Evaluation of applicability of previously qualified libraries in this project.
- Regression analysis and any applicable tests of previously qualified software.
- Evaluation of requirements and determination of verification method (review, inspection, test).
- Assessment of verification coverage.
- Preparation, execution, and reporting of Processor Module Software Test (PMST) for Advant® Controller 160 (AC160) application software.
- Preparation, execution, and reporting of Flat Panel Display Software Test (FPDST)
- Preparation, execution, and reporting of Channel Integration Test (CIT) (designated as FAT as described in Section 1.2)
- Preparation and reporting of Subassembly Hardware Test (SHT), as applicable, and the Cabinet Hardware Test (CHT).
- Updating the RTM for test coverage.

2.4 SCHEDULE

The test schedule is integrated with the Watts Bar Unit 2 PAMS project schedule. The IV&V activities included in the project schedule are maintained by the Project Manager with input from the IV&V Manager. The location of the integrated project schedule is according to the Watts Bar 2 Project Plan (Reference 18). The current project schedule is posted in the eRoom® as a portable document format (PDF) file.

Watts Bar 2 Completion Project > Westinghouse Internal Access > 1.0 PROJECT OFFICE > Project Schedules

The following provides the overall constraints to develop an integrated test schedule:

1. EST – Must be completed before the process control (PC) element or type circuit is used in an application released for validation.
2. PMST – All inspections/tests for a processor module (unit) must be completed prior to the CIT. Reports may be produced in parallel with the CIT but prior to its completion, provided that results of the testing have been captured in anomaly reports and made available to the Design Team.
3. FPDST – Supplements the CIT and validates the FPDS application software for the MTP and OM subsystems. The validation of the FPD is performed prior to CIT. The report may be produced in parallel with CIT but prior to its completion, provided that results of the testing have been captured in anomaly reports and made available to the Design Team.

4. SHT – May be run in parallel with an EST and/or PMST.

5. CHT – May be run in parallel with the EST and/or PMST, but after the SHT.

6. CIT – Also referred to as the FAT within this project, the CIT is the last PAMS test performed at the factory.

7. Site Acceptance Test (SAT) – Shall be executed upon completion of installation of the system at the customer's site.

8. Pre-operational and Startup tests are within the scope of the customer and outside of the scope of this Test Plan. The PAMS system will be exercised during these tests with the parameters calculated prior to the plant startup.

2.5 TESTING ENVIRONMENT

This section describes the general necessary and desired properties of the test environment that should be addressed in the actual test procedures. Each procedure shall identify the physical characteristics of the specific hardware, communications, system software, and any other software or supplies needed to support the test. It shall also identify any other special testing needs such as test tools, software, publications, documentation, and test space as appropriate.

2.5.1 Test Equipment Hardware

Each test procedure shall specify the hardware requirements for conducting the test. The following guidelines shall be used for the various levels of testing:

- ESTs – A custom PC element will be tested on a personal computer configured with the appropriate software test tools that provide structural test (code coverage) results. A custom PC element and a type circuit will undergo functional testing on a representative AC160 processor that is connected to a personal computer with a Windows® operating system, an Advant HDLC driver, and a LabVIEW™-based application providing input test signals and recording output values.

- PMSTs – These tests will be conducted on a representative AC160 processor that is connected to a LabVIEW™-based input/output (I/O) Simulator providing input test signals and recording output values.

- FPSDT – This test may be executed on a representative testbed or on the target system.

- CHT – This is a hardware test and shall be executed on the target hardware assembled in a cabinet for shipment to the customer. Standard voltage measurement tools are used to verify that all AC and DC voltage levels are within required tolerances.

- CIT – This test shall be conducted on the target hardware assembled in a cabinet for shipment to the customer. An I/O simulator shall be connected to the cabinet hardware to provide input test signals and record output values.

2.5.2 Test Equipment Software

The following personal computer software will be used in various aspects of the testing process:

- ABB AMPL Control Configuration (ACC)
- LDRA Testbed® (C language) for code coverage testing of custom PC elements
- Microsoft® Visual C++® for compilation of the LDRA Testbed harness
- PrestoSoft's ExamDiff Pro for source file comparisons
- Tracker Software's PDF-XChange Viewer for AC160 application software inspections
- Microsoft Visual SourceSafe® and in-house developed cqRev for retrieving released software
- LabVIEW™ applications for input simulation and output recording

In addition, Common Q WORKM Lotus Notes tool shall be used to initiate Exception Reports (ERs) and track their resolutions to completion.

2.5.3 Security

Security control of Watts Bar Unit 2 PAMS software shall be maintained through the configuration management procedures as defined in NABU-DP-00015-GEN, "Common Q Software Configuration Management Guidelines" (Reference 4) and the Nuclear Automation Level III Procedure NA 4.37, "Configuration Management" (Reference 10).

The configuration of the hardware and/or software undergoing testing shall be explicitly defined in the individual test procedures in sufficient detail to completely capture the configuration that was tested. The critical attributes for each test, including the hardware and software configuration, shall be documented in accordance with NA 11.0.3, "Test Configuration" (Reference 13).

2.5.4 Cyber Security

Any Cyber Security related tests required by the Contract are outside of the scope of this Test Plan and will be executed by the Cyber Security group.

2.6 TEST TOOLS

An I/O simulator tool may be utilized to generate inputs and read outputs of the equipment under test. Semi-automated testing is supported by the use of test files which will be specified in the test procedures.

Standard calibrated test equipment (e.g., voltmeters, trend recorders) may be utilized as specified by the test procedures. In order to facilitate test repeatability and traceability, the actual test equipment utilized during testing shall be identified on the Test Equipment Log included with the test procedure. The test equipment shall be calibrated and maintained under configuration control for execution of the formal test program.

2.7 FEATURES AND FUNCTIONS TO BE TESTED

This plan incorporates several layers of test activities intended to validate the PAMS implementation. Each type of test activity requires different hardware and software test items. Hardware test items include manufactured subassemblies and completed target cabinets. Software test items include subsystem applications, databases, and communications that form a complete function. Software test items are maintained under configuration control in accordance with NABU-DP-00015-GEN, "Common Q Software Configuration Management Guidelines" (Reference 4).

The design team will provide the items to be tested to the IV&V test team by release notification per the V&V Process for Common Q Safety Systems (Reference 2). The design team will notify the IV&V team whenever a new version of previously released software is available.

The design team is responsible for configuration control of the equipment to be tested per NABU-DP-00014-GEN (Reference 19).

All testable requirements for the PAMS features and functions shall be tested with explicit acceptance criterion. Each feature and function identified within the requirements documents shall be verified either via test, inspection, or both. Maintenance of an RTM shall provide evidence of complete coverage of PAMS features and functions.

The critical attributes for each test, including the hardware and software configuration, shall be documented in accordance with NA 11.0.3, "Test Configuration" (Reference 12).

2.8 FEATURES AND FUNCTIONS NOT COVERED BY THIS TEST PROCESS

Although a majority of the activities associated with testing are explicitly addressed in this test plan, a few are not. Some examples of those items not considered a part of the testing are:

- Commercial off-the-shelf items that have been addressed as part of the Common Qualified Platform
- Equipment qualification, including electrical isolation testing and environmental testing (e.g., temperature, humidity, seismic)
- Administrative software
- Commercial applications software (e.g., word processing)
- Other software (e.g., commercial grade dedication, customer delivered software)

2.9 RISKS AND CONTINGENCIES

The following lists the risks and contingencies associated with the PAMS test plan.

- The purpose of testing is to verify requirements and discover potential errors. Overall project risks can be minimized if errors are discovered early, and promptly reported to the design team for resolution.

- Testing shall be performed on a system under strict configuration control. Therefore, testing should be coordinated with specific project baselines. Ensuring that the test program has a well-defined regression process to handle changes from the baselines is essential.

- Dry-run of test procedures minimizes risk.

- A basic decision to make during testing is whether to take time to allow the design team access to the system to fully debug an error when detected, or just to note the error and proceed with testing. The former approach enhances the chance of test success.

- If additional functional design requirements are needed or test anomalies are discovered during test activities, a regression analysis shall be performed to determine the necessary extent of activities required to re-verify and/or validate the resulting software changes.

2.10 STANDARDS, PRACTICES, AND CONVENTIONS

Standards, practices, and conventions for the testing effort that differ from those stated in this process shall be specifically stated and justified in the Project Quality Plan. As per Section 5.5 of the V&V Process (Reference 2), these differences shall be summarized in the IV&V summary report.

(Last Page of Section 2)

SECTION 3
TESTING PROCESS ACTIVITIES AND TASKS

3.1 TESTING METHODOLOGY

The Westinghouse test philosophy is to use a phased approach, which tests system aspects, hardware and software, as they are completed. This philosophy allows for identification and correction of issues early in the process, thereby preventing errors from being carried over to the next stage. This approach is also essential in confirming that the application meets the requirements. See WNA-SQ-00047-GEN, "Standard Integrated Instrumentation and Control Validation and Test Strategy" (Reference 11) for more details concerning the Nuclear Automation testing strategy.

The PAMS test program is implemented through a succession of independent tests performed at increasing levels of integration of hardware, software, and interfaces. The test program addresses the requirements per WNA-PT-00058-GEN, "Testing Process for Common Q Safety Systems" (Reference 3), and is applied to the project PAMS testing strategy as defined in this plan and summarized in Table 3.1-1. WNA-PV-00009-GEN (Reference 2) describes the relationship between the software lifecycle phases and the tests described in this section.

Table 3.1-1. Watts Bar Unit 2 PAMS Test Program

		Test Phase		
		Module (Component)	**Unit (Assembly)**	**Cabinet/Channel Integration**
Test Scope	**Hardware**	SHT	CHT	–
	Software	EST	PMST	FPDST
	Integrated	-	-	CIT

3.2 SUBASSEMBLY HARDWARE TESTS

The SHT confirms proper operation of hardware subassemblies following manufacture and prior to installation into the PAMS cabinet or OM. The SHT verifies the requirements specified for the product.

The SHT performed on the PAMS hardware assemblies are platform SHT. There are no WBT PAMS project specific hardware assemblies SHT.

Hardware subassemblies purchased from outside suppliers that are to be included in the PAMS will undergo supplier testing as specified in the procurement documents.

Commercial-grade hardware subassemblies procured for PAMS will have CDIs in accordance with quality procedure WEC 7.2, "Dedication of Commercial Grade Items." Westinghouse uses a CDI to verify that delivered hardware meets the design requirements. The CDI and/or hardware drawings specify in-house test procedures that are performed on these subassemblies.

3.3 CABINET HARDWARE TESTS

The CHT addresses the PAMS hardware requirements and design statements documented in WNA-DS-01617-WBT, "Post Accident Monitoring System – System Requirements Specification" (Reference 6) and WNA-DS-01667-WBT, "Post Accident Monitoring System – System Design Specification" (Reference 7).

The CHT is performed prior to the CIT. The CHT procedure establishes the hardware configuration for the cabinet and OM deliverable hardware.

The CHT verifies the cabinet as-built hardware configuration against approved design drawings. The test also consists of initial factory energization checks that are conducted to prevent damage by ensuring that source power and grounding requirements to the various system components have been met.

The CHTs for the Watts Bar Unit 2 PAMS:

a,c

[redacted]

3.4 ELEMENT SOFTWARE TEST

The purpose of the EST is to validate a reusable software element (RSE) created for the Advant AC160 product line in the form of type circuit or custom PC element.

A type circuit is a prearranged group of the smaller pre-existing commercially available software units (PC elements) into a larger, more complex software entity. Type circuits are not compiled code, but are AMPL macro definitions that can be saved individually and reused throughout one or more projects. Custom PC elements are compiled from source code written in C language and added to the library of standard PC elements available for AMPL programming.

Common software elements that are type circuits or general purpose custom PC elements (new PC elements intended for common use in multiple projects or repeated times within the same project) are documented with a composite document referred to as a reusable software element document (RSED). An RSED combines requirements, design description, software description, and user information into a single document. If the software design of a generic system identifies the need for custom PC elements or type

circuits that could be used as general purpose elements, they are developed as generic elements with their own RSEDs.

Those RSEs are generically qualified through EST process.

3.4.1 Approach

The software Element Under Test (EUT) shall be identified by a Software Release Record (SRR). For each release of the element software code as defined by the corresponding SRR, IV&V will perform a specific set of verification activities against the element software code, using the RSED as the basis of these activities.

These activities include:

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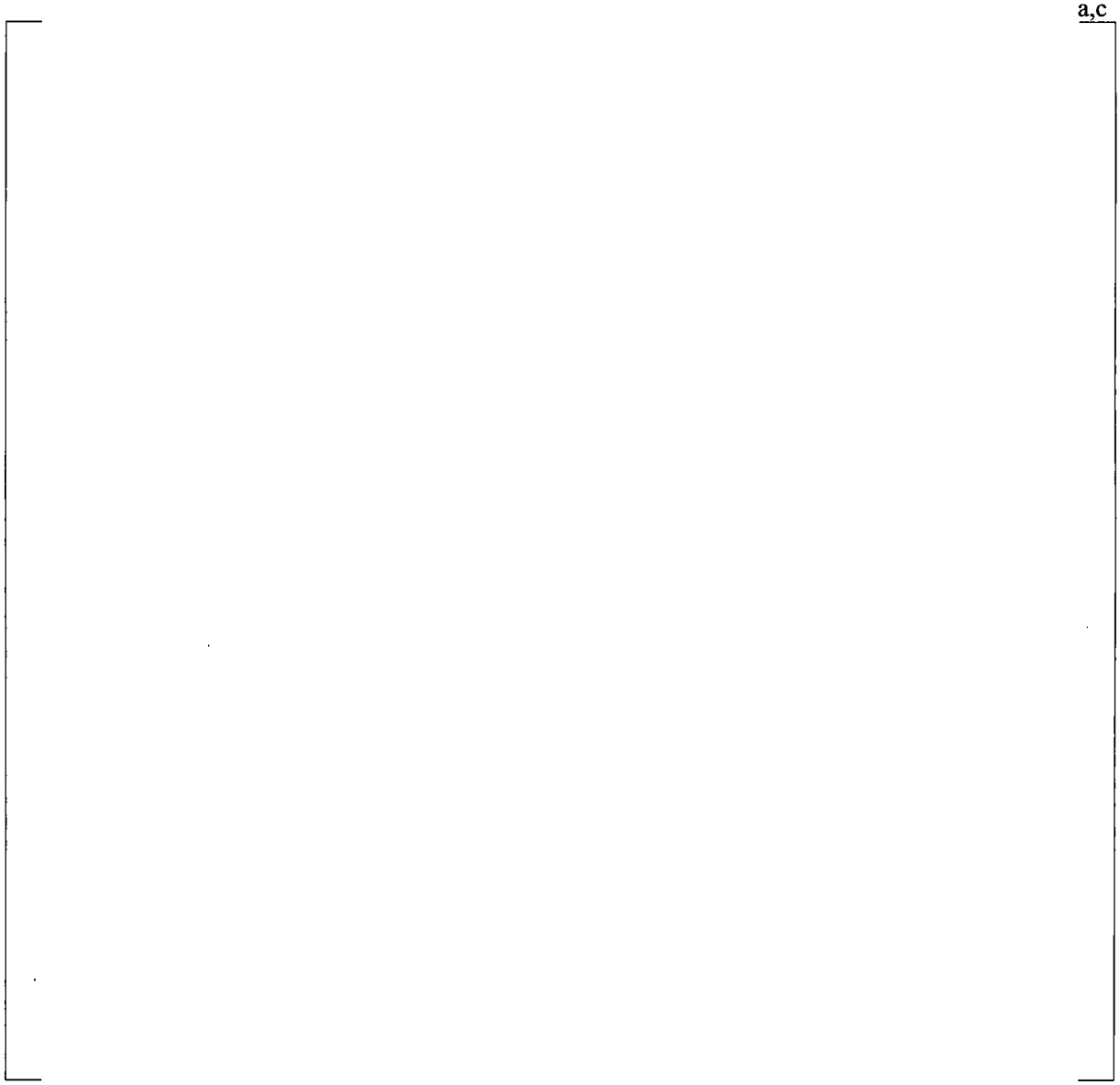

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3.4.2 Requirements Review

As required by NABU-DP-00014-GEN, "Design Process for Common Q Safety Systems" (Reference 1), an RSE shall be validated against its requirements specification.

After release of the RSED to IV&V, its review begins with the inspection of requirements for accuracy, clarity and completeness. In addition, the implementation drawing shall be verified against its requirements specification. Anomalies identified within the RSED review shall be captured in an Exception Report. Depending on the nature of the anomalies, a decision is made whether to proceed with the testing. RSED requirements review must be completed prior to proceeding with the EST testing.

3.4.3 Testing

The EST for newly developed PC elements shall be a combination of functional test and structural test. Functional and structural testing shall be based on the software requirements and accomplished through generation of test cases that exercise the boundaries and the internal branches and paths of the software. To the extent possible, unintended functionality shall be proven to be non-existent in the software as a result of this testing. Testing shall not start until software is released via Software Release Record (SRR).

Test cases shall verify that the software element satisfies the following as appropriate:

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Test cases shall be developed for the EUT based on the specification identified and referenced in the specific EST procedure. Test case inputs and expected outputs, along with rationale for each test case, shall be provided in a Test Case file. The Test Case file shall be identified within the specific EST procedure.

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[ ]

At the completion of the test, failures (if any) shall be entered into the WORKM Common Q database used for error reporting and resolution tracking.

A separate Test Report shall be prepared documenting the test results. The Test Report shall report on the resolution status of all anomalies associated with the EUT.

An EST shall be successfully completed before any application software using the custom PC element or type circuit is released for production.

3.4.4 Regression Analysis

New revisions of element software code and pertinent requirement documents will be analyzed against their previous revisions to determine the extent of the changes made to these artifacts, the areas of the software element code that were directly or indirectly affected, and which requirements and features will need to be re-verified.

Test cases developed in previous release cycles may also be re-executed to ensure that no unintended changes in functional behavior have occurred as a result of changes made to the current revision under test.

3.4.5 EST Deliverables

An EST Procedure and an EST Report will be generated. The same documents may be revised after a regression analysis as new revisions of the RSE are released to IV&V.

In general, each document will contain the following key data:

- EST Procedure with renditions of the Test Case Input file and the preliminary Test Log file to record chronologically relevant details related to the execution of the test.

- EST Report with renditions of the Functional Test Output file, the completed Test Log file capturing the configuration of the test environment and the major events, the structural test output files (for custom PC elements), and error reporting and resolution tracking database records (any created for the EUT).

3.4.6 Crediting Generic Qualification for Watts Bar Unit 2 PAMS

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3.5 PROCESSOR MODULE SOFTWARE TESTS

The purpose of the PMST is to verify that the AC160 Application Code complies with the requirements described in the Software Requirements Specification (SRS), and that no unintended functional behavior outside the scope of the SRS is expected to occur. In general, various methods of requirements analysis, code inspection, and testing of the AC160 application code will be employed to accomplish this goal. PMST testing will be limited to a representative subset of the target hardware, as a complete copy of the customer's hardware configuration will not be available to the IV&V team. As such, only the communication interface module and the processor module need to be available for PMST. Heretofore, this hardware combination will be referred to as the IV&V Test Platform.

3.5.1 Approach

For each release of the AC160 application code as defined by the corresponding SRR, IV&V will perform a specific set of verification activities against the application code, using the SRS as the basis of these activities. In general these activities include requirements analysis, code inspections, and testing of the code on the IV&V Test Platform.

3.5.2 Requirements Analysis

Upon reception of the approved AC160 code and the corresponding SRS, IV&V will review all requirements specified in the SRS to determine the means by which each requirement will be verified. Specifically, each requirement will be vetted to determine if the requirement can be adequately verified by way of inspection only, or if testing of the code will be necessary. If it is determined that a requirement must be verified through test activity, a further determination will be made as to whether the requirement

can reasonably be tested during PMST, given the hardware limitations of the IV&V Test Platform. If the requirement cannot be verified and tested during PMST, it will be tested on the customer's target hardware when the CIT or the FPDST is performed. This typically occurs after PMST tests have been completed. The PMST and CIT/FPDST test teams will then reach consensus on the vetting of all requirements to ensure that there is no confusion regarding requirement verification responsibilities.

3.5.3 Application Code Inspection

The SRS requirements and the application code will be compared in a bidirectional manner. That is, the requirements will be analyzed against the application code, and conversely the application code will then be compared back to the SRS requirements. This will ensure that all requirements have been fully implemented in the code, and that there are no constructs within the code that cannot be referenced back to a particular or group of requirements.

This will be accomplished as follows:

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[redacted]

3.5.4 Application Code Testing

All requirements designated as verifiable through PMST testing via Requirements Analysis will be tested on the IV&V Test Platform. Given the hardware limitations of this platform, it will be necessary to modify I/O terminals of the application to work with High Speed Link (HSL) database elements, as opposed to the implemented communication interfaces which use DATs, Analog Input/Analog Output (AI/AO), and Digital Input/Digital Output (DI/DO) database elements, among others. This will enable the AC160 application code to be controlled by the Standard I/O Simulator Application (SIOS), which can only communicate to the processor module through HSL ports.

Test cases corresponding to each PMST-designated requirement will be created and recorded in the PMST Test Procedure. Test execution results for all tests will be recorded in the PMST Test Report.

3.5.5 Regression Analysis

New revisions of application code and pertinent requirement documents will be analyzed against their previous revisions to determine the extent of the changes made to these artifacts, the areas of the application code that were directly or indirectly affected, and which requirements and features will need to be re-verified.

Test cases developed in previous release cycles may also be re-executed to ensure that no unintended changes in functional behavior have occurred as a result of changes made to the current revision under test.

3.5.6 PMST Test Deliverables

A single PMST Test Procedure and potentially multiple revisions of the PMST Test Report will be generated. The number of Test Report revisions will be dependent upon the number of application code releases to IV&V.

In general, each document will contain the following key data:

- Test Procedure – Test environment configuration, test case input data, test case to SRS cross reference, modifications made to the application code to accommodate the IV&V Test Platform.

- Test Report – Pass/Fail determination, Test Case Modifications, Test results (output logs), Regression Analysis (if needed), and ERs.

3.6 FLAT PANEL DISPLAY SOFTWARE TEST

The FPDST supplements the CIT by demonstrating that software for the FPDS is functional and ready for integration into the Watts Bar Unit 2 PAMS.

The FPDST validates the display software and ensures that the FPDS complies with all display requirements related to the PAMS System Requirement Specification (Reference 6), PAMS System Design Specification (Reference 7), and PAMS Software Requirement Specification (Reference 8).

The FPDS operating system software and common libraries have been previously qualified per IV&V Summary Report (Reference 14).

The overall objective of the FPDST is to validate the functionality of the FPDS application software in the PAMS. This objective can be broken into three sections that will allow for thorough, accurate testing with clear, distinct results and acceptance. Those sections will be applied to each display in the software, and are Graphical Layout, Functionality, and Common Display Features.

3.6.1 Graphical Layout

Graphical Layout tests ensure that, on each display, all necessary aspects are visible and located where they are supposed to be. These objectives include:

Verification of proper display hierarchy

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3.6.2 Functionality

Functionality tests verify that, on each display, every functional object properly performs its intended function and every indicator properly displays its intended field. These objectives include:

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3.6.3 Common Display Features

Common Display Features include the buttons and indicators in the header and footer of each display. These features do not vary between screens and will be tested with the same method for each display. However, some displays contain information relevant to the header and footer features and will be tested more extensively in the Common Display Features tests. The objectives of the Common Display Features tests include:

[a,c]

3.7 CHANNEL INTEGRATION TESTS

The CIT, also referred to as the FAT, addresses the PAMS requirements documented in WNA-DS-01617-WBT, "Post Accident Monitoring System – System Requirements Specification" (Reference 6).

The CIT is a functional test that verifies integration of the released software with the deliverable hardware. The customer's acceptance of these test results is part of an authorization of shipment of the equipment.

Due to the amount of inputs and outputs utilized in PAMS, an I/O simulator was built to assist with portions of this test. The I/O simulator comprises a National Instruments Peripheral Component Interface (PCI) and PCI extensions for instrumentation (PXI) circuit cards which are driven by an industrial PC using the LabView program.

The CIT for the Watts Bar Unit 2 PAMS verifies the following:

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The tuning constants from Watts Bar Unit 1 will be used as part of the test inputs to validate the proper functionality of the RVLIS algorithm during factory testing. The Unit 2 specific constants will be obtained during pre-op/startup tests. These Operational Acceptance Test are not Westinghouse scope of supply and therefore, outside the scope of this plan. The generic RVLIS Library consists of individual Custom PC Elements that were already verified through EST by exercising a range of inputs for tuning constants. Therefore, the use of Unit 1 tuning constants to demonstrate RVLIS functionality during PMST and CIT is appropriate.

3.8 SYSTEM INTEGRATION TESTS

Watts Bar Unit 2 is based on the Westinghouse Common Q PAMS standard design as described in Section 1 of Reference 6. The Common Q PAMS comprises a single cabinet; therefore, the SIT is not applicable to this Test Plan.

3.9 SITE ACCEPTANCE AND OPERATIONAL ACCEPTANCE TESTS

The purpose of SAT is to verify interfaces after the system is installed at the customer's site. The site test personnel shall define and control the test. The primary intent of this test shall be to validate that the equipment was not damaged during shipment or installation. External system interface testing shall be specified in the SAT procedure.

The pre-op/startup tests (a.k.a., Operational Acceptance Test) are not Westinghouse scope of supply and therefore, outside the scope of this plan.

3.10 TESTING SUSPENSION AND RESUMPTION

3.10.1 Suspension Criteria

The tester may suspend testing anytime if the prerequisites for any test step cannot be met or if testing does not produce the expected results in a sequence of test steps (e.g., the test has procedural or software errors). If a lower-level test (i.e., PMST prior to the CIT) was not completed, then the upper-level testing can be performed, but the results of the lower-level test, when complete, will be reviewed to ascertain any impacts. Upper-level testing cannot be considered complete until the lower-level test is complete.

3.10.2 Resumption Requirements

Testing may be resumed after the condition(s) that required suspension of the test has been corrected (e.g., failed hardware item replaced, new version of system software to correct software error). The resumption of testing shall include any retest necessary to verify that the issue for the original test suspension has been corrected and will follow the appropriate retest process. Any resumption of testing will be authorized by the IV&V Test Lead.

3.10.3 Pass/Fail Criteria

PAMS must satisfy specified functional and performance requirements as identified in the documents listed in Section 1.4. To determine if a test has successfully passed, specification of pass/fail criteria shall be provided in the applicable test procedure specification(s) (TPS). For expected numerical test results, an acceptable range shall be provided. For expected test results that are logical conditions or alarm states, the specific digital value or state shall be provided.

Pass/fail acceptance criteria shall be captured in the TPS customized datasheets.

If a pass/fail criterion is not met during a test, the failure should be clearly captured in the test log and, as applicable, entered into the project-specified anomaly reporting system for tracking purposes and disposition.

3.10.4 Regression Testing

Safety System changes can occur for several reasons. For example, changes can be made at the direction of the Customer or as a result of problems discovered during testing. It is normal for hardware and software modifications to be required during the system test period. All changes shall be formally documented and controlled according to established safety system project procedures.

Any time a problem is found and corrected or a change is made in the system, a regression analysis is performed and documented in the defect/problem tracking system. Once it has been determined what subsystems and elements have been affected, a review of the appropriate test procedure shall be performed to determine the changes in testing.

Original tests are performed on target or surrogate hardware as defined in the safety system test procedures. For tests performed on target hardware, the target hardware may not be available once the original tests have been completed. In this case, it is permissible to perform regression testing on surrogate equipment. Surrogate equipment performance and interface loading must be equivalent to the target equipment for the level of testing performed.

(Last Page of Section 3)

SECTION 4
TEST DELIVERABLES

The documents listed in the following sections will be generated by the system test program and will be stored as quality records and/or project records. Test documents to be delivered to the customer will be in accordance with the project document delivery schedule.

4.1 TEST PROCEDURES

Individual test procedures will incorporate means for recording test results. Test procedures shall have the following structure per NA 11.0.2, "Test Procedures" (Reference 25):

- Front Matter – Cover Page, List of Contributors/Reviewers, Revision History, Table of Contents, Acronyms/Trademarks, Glossary, and References
- Purpose and Scope
- Objectives
- Acceptance Criteria
- Test Guidelines
- Test Equipment
- Prerequisites
- Initial Conditions
- Precautions
- Procedure Steps
- Equipment Conditions Post-Test
- Test Results

Any computer-generated output, such as a data log, will be annotated with the appropriate test step or section, date, time, and name of the tester.

4.2 TEST LOGS

An electronic version of a test log shall be maintained. Test logs provide a chronological record of relevant details about the execution of tests. The log shall identify, as appropriate:

- Test procedure
- Project, system
- Date(s) the testing was conducted
- Author of the log entry
- Relevant attributes of the test environment not previously recorded, including observed significant results, error messages, output data, circumstances surrounding any anomalous events, and other relevant actions taken

All errors detected shall be noted in the test log. Errors requiring software revisions shall be recorded in the anomaly report database for tracking and resolution. It is recommended that errors be entered into the anomaly database daily so as to allow the design team maximum time to resolve the errors. After the errors and/or deviations are entered into the anomaly report database, the anomaly report number shall be recorded in the test log and on the test data sheet next to the associated anomaly, error, or deviation.

Random hardware failures shall also be noted in the test log. Corrective action, along with confirmation that an appropriate level of test has been completed on the restored hardware, will be noted.

Test Log entries made by test personnel other than the test leader should be initialed by the individual who makes the entry.

Late entries should be designated as such, and should indicate the date and time the entry is actually entered, as well as the date and time the documented event actually transpired.

4.3 TEST REPORTS

The test reports shall follow the report format and requirements as specified in NA 11.0.4, "Test Results" (Reference 12).

Test reports shall provide the complete test results. Individual test procedures may incorporate the procedure and expected test results. Individual test procedures also contain a place for recording actual test results.

In addition, test reports should include, as appropriate:

- Purpose and objective of test
- Reference to test specification(s)/test procedures(s)

- Summary (analysis of test results)
- Conformance with criteria (a summary of test results versus criteria, including a narrative format where necessary to explain acceptability of results)
- Identification of test specimen (EUT)
- Identification of test equipment/test instrumentation
- Test data records (raw test data/test data sheets)
- Identification of test configuration record(s)
- Identification of test anomalies

The test report, together with the test procedure, shall document the test execution and results. The test documentation shall be complete enough to repeat the process and correlate new results with original results.

4.4 ANOMALY REPORTS

Anomaly reports shall document each discrepancy found during the testing process as described in Section 4.4 of Reference 3. These reports shall be uniquely identified, shall stay active until a closed status is achieved and shall be included in the error-reporting database (within the WORKM Lotus Notes application).

Conditions under which ERs should be initiated include, but are not limited to:

- Deviations from expected test results
- Test procedure errors
- Unexpected situations or conditions that may impact the performance or results of the test (e.g., industrial safety issues)

Testing anomalies should be brought to the attention of the test leader for resolution. The test leader should determine the appropriate course of action, which may include suspension of test performance, troubleshooting, notification of the appropriate individuals, etc.

4.5 REQUIREMENTS TRACEABILITY

Requirements traceability shall be implemented in accordance with NA 4.32, "Requirements Management and Traceability" (Reference 15) and shall be documented in Requirement Traceability Matrix for the Post Accident Monitoring System (WNA-VR-00279-WBT) and Requirement Traceability Matrix for the Reactor Vessel Level Indication System Custom PC Elements (WNA-VR-00280-WBT).

4.6 VERIFICATION AND VALIDATION REPORT

See WNA-PV-00009-GEN (Reference 2) for IV&V phase summary report information.

(Last Page of Section 4)
(Last Page of Document)

Attachment 17

Westinghouse Electric Company document CAW-11-3252, "Application For Withholding Proprietary Information From Public Disclosure, WNA-PT-00138-WBT-P, Rev. 0 "Post Accident Monitoring System Test Plan," (Proprietary) dated September 23, 2011

Westinghouse Electric Company
Nuclear Services
1000 Westinghouse Drive
Cranberry Township, Pennsylvania 16066
USA

U.S. Nuclear Regulatory Commission
Document Control Desk
11555 Rockville Pike
Rockville, MD 20852

Direct tel: (412) 374-4643
Direct fax: (724) 720-0754
e-mail: greshaja@westinghouse.com
Proj letter: WBT-D-3502

CAW-11-3252

September 23, 2011

APPLICATION FOR WITHHOLDING PROPRIETARY INFORMATION FROM PUBLIC DISCLOSURE

Subject: WNA-PT-00138-WBT-P, Rev. 0, "Post Accident Monitoring System Test Plan" (Proprietary)

The proprietary information for which withholding is being requested in the above-referenced report is further identified in Affidavit CAW-11-3252 signed by the owner of the proprietary information, Westinghouse Electric Company LLC. The affidavit, which accompanies this letter, 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 10 CFR Section 2.390 of the Commission's regulations.

Accordingly, this letter authorizes the utilization of the accompanying affidavit by Tennessee Valley Authority.

Correspondence with respect to the proprietary aspects of the application for withholding or the Westinghouse affidavit should reference this letter, CAW-11-3252, and should be addressed to J. A. Gresham, Manager, Regulatory Compliance, Westinghouse Electric Company LLC, Suite 428, 1000 Westinghouse Drive, Cranberry Township, Pennsylvania 16066.

Very truly yours,

J. A. Gresham, Manager
Regulatory Compliance

Enclosures

CAW-11-3252

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

ss

COUNTY OF BUTLER:

Before me, the undersigned authority, personally appeared J. A. Gresham, who, being by me duly sworn according to law, deposes and says that he is authorized to execute this Affidavit on behalf of Westinghouse Electric Company LLC (Westinghouse), and that the averments of fact set forth in this Affidavit are true and correct to the best of his knowledge, information, and belief:

J. A. Gresham, Manager
Regulatory Compliance

Sworn to and subscribed before me
this 23th day of September 2011

Renee' Giampole
Notary Public

COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
Renee Giampole, Notary Public
Penn Township, Westmoreland County
My Commission Expires September 25, 2013

(1) I am Manager, Regulatory Compliance, in Nuclear Services, Westinghouse Electric Company LLC (Westinghouse), and as such, I have been specifically delegated the function of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear power plant licensing and rule making proceedings, and am authorized to apply for its withholding on behalf of Westinghouse.

(2) I am making this Affidavit in conformance with the provisions of 10 CFR Section 2.390 of the Commission's regulations and in conjunction with the Westinghouse Application for Withholding Proprietary Information from Public Disclosure accompanying this Affidavit.

(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 the provisions of paragraph (b)(4) of Section 2.390 of the Commission's regulations, 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.

(ii) The information is of a type customarily held in confidence by Westinghouse and not customarily disclosed to the public. Westinghouse has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitutes Westinghouse policy and provides the rational basis required.

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.

There are sound policy reasons behind the Westinghouse system which include the following:

(a) The use of such information by Westinghouse gives Westinghouse a competitive advantage over its competitors. It is, therefore, withheld from disclosure to protect the Westinghouse competitive position.

(b) It is information that is marketable in many ways. The extent to which such information is available to competitors diminishes the Westinghouse ability to sell products and services involving the use of the information.

(c) Use by our competitor would put Westinghouse at a competitive disadvantage by reducing his expenditure of resources at our expense.

(d) Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component may be the key to the entire puzzle, thereby depriving Westinghouse of a competitive advantage.

(e) Unrestricted disclosure would jeopardize the position of prominence of Westinghouse in the world market, and thereby give a market advantage to the competition of those countries.

(f) The Westinghouse capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.

(iii) The information is being transmitted to the Commission in confidence and, under the provisions of 10 CFR Section 2.390, it is to be received in confidence by the Commission.

(iv) The information sought to be protected is not available in public sources or available information has not been previously employed in the same original manner or method to the best of our knowledge and belief.

(v) The proprietary information sought to be withheld in this submittal is that which is appropriately marked in WNA-PT-00138-WBT-P, Rev. 0, "Post Accident Monitoring System Test Plan" (Proprietary), dated November 2010 for submittal to the Commission, being transmitted by Tennessee Valley Authority letter and Application for Withholding Proprietary Information from Public Disclosure, to the Document Control Desk. The proprietary information as submitted by Westinghouse is that associated with the incore instrument system (IIS) and may be used only for that purpose.

This information is part of that which will enable Westinghouse to:

(a) Assist the customer in providing technical licensing information to the NRC that is required for approval of the Watts Bar Nuclear Unit 2 IIS.

Further this information has substantial commercial value as follows:

(a) Westinghouse plans to sell the use of similar information to its customers for the purpose of licensing incore instrumentation systems.

(b) Its use by a competitor would improve his competitive position in the development and licensing of a similar product.

(c) The information requested to be withheld reveals the distinguishing aspects of a design developed by Westinghouse.

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 calculations, analysis 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.

The development of the technology described in part by the information is the result of applying the results of many years of experience in an intensive Westinghouse effort and the expenditure of a considerable sum of money.

In order for competitors of Westinghouse to duplicate this information, similar technical programs would have to be performed and a significant manpower effort, having the requisite talent and experience, would have to be expended.

Further the deponent sayeth not.

PROPRIETARY INFORMATION NOTICE

Transmitted herewith are proprietary and/or non-proprietary versions of documents furnished to the NRC in connection with requests for generic and/or plant-specific review and approval.

In order to conform to the requirements of 10 CFR 2.390 of the Commission's regulations concerning the protection of proprietary information so submitted to the NRC, the information which is proprietary in the proprietary versions is contained within brackets, and where the proprietary information has been deleted in the non-proprietary versions, only the brackets remain (the information that was contained within the brackets in the proprietary versions having been deleted). The justification for claiming the information so designated as proprietary 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 refer to the types of information Westinghouse customarily holds in confidence identified in Sections (4)(ii)(a) through (4)(ii)(f) of the affidavit accompanying this transmittal pursuant to 10 CFR 2.390(b)(1).

COPYRIGHT NOTICE

Tennessee Valley Authority

Letter for Transmittal to the NRC

The following paragraphs should be included in your letter to the NRC:

Enclosed are:

1. __ copies of WNA-PT-00138-WBT-P, Rev. 0, "Post Accident Monitoring System Test Plan" (Proprietary)
2. __ copies of WNA-PT-00138-WBT-NP, Rev. 0, "Post Accident Monitoring System Test Plan" (Non-Proprietary)

Also enclosed is the Westinghouse Application for Withholding Proprietary Information from Public Disclosure CAW-11-3252, accompanying Affidavit, Proprietary Information Notice, and Copyright Notice.

As Item 1 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.

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-11-3252 and should be addressed to J. A. Gresham, Manager, Regulatory Compliance, Westinghouse Electric Company LLC, Suite 428, 1000 Westinghouse Drive, Cranberry Township, Pennsylvania 16066.