



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

January 20, 2011

Mr. Ashok S. Bhatnagar  
Senior Vice President  
Nuclear Generation Development  
and Construction  
Tennessee Valley Authority  
6A Lookout Place  
1101 Market Street  
Chattanooga, TN 37402-2801

SUBJECT: WATTS BAR NUCLEAR PLANT, UNIT 2 – COMMERCIAL GRADE  
DEDICATION OF HARDWARE AND SOFTWARE USED IN THE  
POST-ACCIDENT MONITORING (PAMS) SYSTEM AUDIT REPORT  
(TAC NO. ME2731)

Dear Mr. Bhatnagar:

The U.S. Nuclear Regulatory Commission (NRC) staff performed an audit of the commercial grade dedication of the new or changed Common Q hardware and software to be used at the Watts Bar Nuclear Plant, Unit 2. The audit took place from September 20 to September 21, 2010 at Westinghouse's facility located in Windsor Locks, Connecticut. Enclosed is the audit summary report prepared by the NRC staff.

If you should have any questions, please contact me at 301-415-2048.

Sincerely,

A handwritten signature in black ink, appearing to read "Justin C. Poole", is written over a horizontal line.

Justin C. Poole, Project Manager  
Watts Bar Special Projects Branch  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-391

Enclosure:  
Audit Summary

cc w/encl: Distribution via Listserv

REGULATORY AUDIT SUMMARY OF THE  
COMMERCIAL GRADE DEDICATION DOCUMENTATION OF THE  
NEW OR CHANGED COMMON Q HARDWARE AND SOFTWARE OF THE  
POST-ACCIDENT MONITORING SYSTEM USED AT  
WATTS BAR NUCLEAR PLANT, UNIT 2

BACKGROUND

By letter dated December 5, 2008 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML083440224), as supplemented by letter dated February 28, 2009 (ADAMS Accession No. ML090570741), the Tennessee Valley Authority (TVA) requested the approval of the Common Q based Post Accident Monitoring System (PAMS). The audit followed the plan for the audit (ADAMS Accession No. ML102560386).

Individuals the staff interacted with included:

Steve Hilmes, TVA	
Gregory A. Gisoni, Westinghouse (WEC)	Andrew P. Drake, WEC
Mark J. Stofko, WEC	Allen C. Denyer, WEC
Stanley E. Dlugolenski Jr., WEC	Richard M. Manazir Jr., WEC
Stephen L. Packard, WEC	Martin P. Ryan, WEC
Harold T. Maquire Jr., WEC	Mesut B. Uzman, WEC
Murat S. Uzman, WEC	Matthew A. Shakun, WEC
Shawn Downey, WEC (Part time)	Warren R. Odess-Gillett, WEC (Part time)
Andrew Konzel, WEC (Part time)	Arthur J. Trozzi, WEC (Part time)

AUDIT SUMMARY

This audit was conducted in accordance with the regulatory basis identified in the audit plan.

As described in the audit plan, the following audit focus areas were covered

1. Commercial Grade Dedication Information of the New or Changed Hardware
2. Commercial Grade Dedication Information of the New or Changed Software
3. Reusable Software Elements

Summaries of the specific audit activities and conclusions follow, categorized by their focus area. These were briefly described at the exit briefing.

ENCLOSURE

1. Commercial Grade Dedication Information of the New or Changed Hardware:

The Nuclear Regulatory Commission (NRC) staff traced a few generic critical characteristics through the generic hardware commercial grade dedication documentation. It was determined that Westinghouse has a detailed, thorough, and proprietary process that is difficult to explain. It was also determined that the amount of material that would need to be docketed to support such an explanation would not be consistent with the safety significance of the PAMS application in Watts Bar Nuclear Plant, Unit 2 (WBN2). The NRC determined that it would not be appropriate to approve the generic commercial grade dedication process as part of this project. The NRC determined that Westinghouse did not have documentation of how the WBN2 critical characteristics were explicitly addressed by the generic components. The NRC staff requested that TVA/Westinghouse perform an evaluation that the WBN2 requirements on the commercial hardware are enveloped by the generic qualification of that hardware (e.g., see last paragraph of Electric Power Research Institute (EPRI) technical report (TR)-107330 Section 1.1, "Background").

2. Commercial Grade Dedication Information of the New or Changed Software:

The staff traced a few of generic critical characteristics through the generic software commercial grade dedication documentation. It was determined that Westinghouse has a detailed, thorough, and proprietary process that is difficult to explain. It was also determined that the amount of material that would need to be docketed to support such an explanation would not be consistent with the safety significance of the PAMS application in WBN2. The NRC determined that it would not be appropriate to approve the generic commercial grade dedication process as part of this project. The NRC also determined that Westinghouse did not have documentation of how the WBN2 critical characteristics were explicitly addressed by the generic components. The NRC staff requested that TVA/Westinghouse perform an evaluation that the WBN2 requirements on the commercial software are enveloped by the generic qualification of that software (e.g., see last paragraph of EPRI TR-107330 Section 1.1, "Background").

3. Reusable Software Elements:

The functions that are described in abstract terms (i.e., reactor vessel level indication system) are designed and implemented by a set of generic modules (i.e., Reusable Software Elements). There has been no information docketed that describes the development of these modules. The NRC staff traced a requirement from the PAMS system requirements specification to the reusable software element documents (RSEDs) and finally to the associated verification and validation (V&V) test procedure.

The staff will need to make a determination of whether these RSED's can be audited as a confirmatory measure to ensure that the process for developing them is being appropriately implemented or if the RSED's themselves need to be docketed and reviewed. Furthermore, the staff must determine if the RSED's should be reviewed at the generic platform level or at the application level licensing review stage.

4. Review of Commercial Grade Dedication Documents for the Upcoming Common Q Platform Safety Evaluation:

A discussion of the upcoming Common Q platform licensing topical report update review was held. A preliminary agreement was reached on the required documentation to support the commercial dedication activities related to the changes made to the platform. For new assemblies, the initial commercial dedication reports will be docketed and for product updates, the dedication reports for the changes made will be docketed and reviewed. This approach is consistent with the documentation that was required for the initial TR safety evaluation.

OPEN ITEMS/ CLOSURE PATHS:

1. TVA/Westinghouse agreed to include a description of their generic hardware commercial grade dedication process in the PAMS licensing technical report. (Open Item No. 138 of the Instrumentation and Control Open Item List)
2. TVA/Westinghouse agreed to include (in the PAMS licensing technical report) an evaluation of WBN2 critical characteristics for commercial hardware components against the generic critical characteristics. (Open Item No. 138)
3. TVA/Westinghouse agreed to include a description of their generic software commercial grade dedication process in the PAMS licensing technical report. (Open Item No. 138)
4. TVA/Westinghouse agreed to include (in the PAMS licensing technical report) an evaluation of WBN2 critical characteristics for commercial software components against the generic critical characteristics. (Open Item No. 138)
5. TVA/Westinghouse agreed to include the V&V evaluation of their reusable software element development process in the V&V design phase summary report. This evaluation would include an evaluation against the development process requirements. This evaluation would also include an evaluation of how the WBN2 specific requirements were addressed by the reusable software elements. (Open Item No. 142)
6. It was acknowledged that TVA/Westinghouse had previously (in September 15, 2010, public meeting) stated that they would provide the RSED requirements traceability matrix (RTM). (Open Item No. 145)
7. It was acknowledged that TVA/Westinghouse had previously (in September 15, 2010, public meeting) stated that they would revise and resubmit the PAMS RTM to address all types of issues identified in the public meeting. (Open Item No. 145)
8. It was acknowledged that TVA/Westinghouse had previously (in September 15, 2010, public meeting) stated that they would revise and resubmit the Software Verification and Validation phase summary report for the requirements phase to document the completion of the requirements phase review. (Open Item No. 145)

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Sincerely,  
/RA/

Justin C. Poole, Project Manager  
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ADAMS Accession No. ML103400599

\*via memo

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DATE	1/18/11	1/6/11	10/25/10	1/20/11

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