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

October 10, 2008

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

SUBJECT: WATTS BAR NUCLEAR PLANT, UNIT 2 – STATUS OF REGULATORY FRAMEWORK FOR THE COMPLETION OF OPERATING LICENSE REVIEW (TAC NO. MD9424)

Dear Mr. Bhatnagar:

By letters dated January 29 and March 13, 2008, Tennessee Valley Authority (TVA) provided to the Nuclear Regulatory Commission (NRC) its framework for the completion of construction and licensing activities for Watts Bar Nuclear Plant (WBN) Unit 2. In this regard, TVA identified the Unit 2 licensing basis that was reviewed and approved concurrent with the WBN Unit 1 operating license review process. The NRC staff's previous review for WBN Unit 1, and a portion for Unit 2, was documented in NRC Report NUREG-0847, "Safety Evaluation Report [SER] Related to the Operation of Watts Bar Nuclear Plant, Units 1 and 2," through Supplement 20.

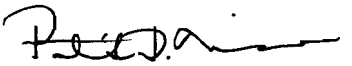
The NRC staff performed an initial assessment of the status presented by TVA and reviewed the information in the SER and its Supplements in order to independently identify whether the topic sections had or had not been previously approved and documented for Unit 2. In a letter dated May 8, 2008, the staff forwarded the results of its initial assessment and identified the topics that it considered as remaining open and to be completed within the operating license review scope. The NRC staff found that many of the existing licensing review topics have already been addressed. However, the staff did not completely agree with TVA's position regarding the status of all topics and requested additional information from TVA to resolve certain differences between the NRC and TVA scoping assessments. On June 16, 2008, TVA responded to the request for additional information, addressing all SER supplements pertinent to a given topic, and revised the overall status summary of the regulatory framework originally provided in the March 13, 2008, letter.

The NRC staff reviewed the revised regulatory framework master table in TVA's letter of June 16, 2008, focusing especially on the information supporting the reconciliation of prior status differences. On the basis of this review, the staff completed its assessment of the regulatory framework for WBN Unit 2 operating license review. Those SER topic items that the NRC staff considers open are listed in the enclosed Table 1. Thus, TVA will need to include these open topic items in future submittals or amendments to the Final Safety Analysis Report. The detailed results of the staff's overall assessment of the regulatory framework can be found in the Table 2. Although many of the topic areas in Table 2 have been adequately documented and are considered closed, the NRC staff recognizes that there may be circumstances that could result in the need to re-open a previously closed topic.

Using the results of NRC's assessment, TVA should revise its regulatory framework status to match the staff's current reconciliation and assessment. In particular, TVA should maintain the list of open items from Table 2 and then update the information as actions are completed, proper documentation submitted to the NRC staff for review, and the NRC staff documents its review and acceptance in an SER Supplement. If TVA or the NRC staff determines that a previously reviewed and completed item needs to be re-opened, TVA should add the item to the list and highlight this action as having occurred. TVA is also requested to provide an update to the status, including references to TVA and NRC supporting documentation, at least every 6 months. The NRC staff will use this information to verify the completion of open actions and to coordinate the need for independent validation of implementation through inspections.

If you have questions regarding the staff's assessment or actions requested of TVA, please contact me at 301-415-1457.

Sincerely,



Patrick D. Milano, Senior Project Manager
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Docket No. 50-391

Enclosures:
Tables 1 and 2, Regulatory Framework Status
for TVA Watts Bar Unit 2

cc w/encls: See next page

Ashok S. Bhatnagar
Tennessee Valley Authority

WATTS BAR NUCLEAR PLANT
UNIT 2

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Table 1.
Topics Open in NUREG-0847
Watts Bar Nuclear Plant Unit 2

Subsection	Title
2.1.3	Population Distribution
2.1.4	Conclusions
2.2.1	Transportation Routes
2.2.2	Nearby Facilities
2.2.3	Conclusions
2.4.8	Design Basis for Subsurface Hydrostatic Loading
2.4.9	Transport of Liquid Releases
3.2.2	System Quality Group Classification
3.6.0	Protection Against the Dynamic Effects Associated with the Postulated Rupture of Piping
3.6.1	Plant Design for Protection Against Postulated Piping Failures in Fluid Systems Outside Containment
3.7.0	Seismic Design
3.7.1	Seismic Input
3.7.2	Seismic Analysis
3.7.3	Seismic Subsystem Analysis
3.8.0	Design of Seismic Category I Structures
3.8.3	Other Seismic Category I Structures
3.9.1	Special Topics for Mechanical Components
3.9.3	ASME Code Class 1, 2, and 3 Components, Component Structures, and Core Support Structures
3.9.6	Inservice Testing of Pumps and Valves
3.10.0	Seismic and Dynamic Qualification of Seismic Category I Mechanical and Electrical Equipment
3.11.0	Environmental Qualification of Mechanical and Electrical Equipment
4.2.1	Description
4.2.2	Thermal Performance
4.2.3	Mechanical Performance
4.2.5	Fuel Design Conclusions
4.3.1	Design Basis
4.3.2	Design Description
4.3.3	Analytical Methods
4.3.4	Summary of Evaluation Findings

Table 1, continued.
Topics Open in NUREG-0847 - Watts Bar Nuclear Plant Unit 2

Subsection	Title
4.4.2	Design Bases
4.4.3	Thermal-Hydraulic Design Methodology
4.4.4	Operating Abnormalities
4.4.5	Loose Parts Monitoring System
4.4.8	Instrumentation for Inadequate Core Cooling Detection (II.F.2)
4.4.9	Summary and Conclusion
5.1.0	Summary Description
5.2.4	RCS Pressure Boundary Inservice Inspection and Testing
5.2.5	Reactor Coolant Pressure Boundary Leakage Detection
5.3.1	Reactor Vessel Materials
5.3.2	Pressure-Temperature Limits
5.3.3	Reactor Vessel Integrity
5.4.3	Residual Heat Removal System
6.2.1	Containment Functional Design
6.2.2	Containment Heat Removal Systems
6.2.5	Combustible Gas Control Systems
6.2.6	Containment Leakage Testing
6.3.1	System Design
6.3.2	Evaluation
6.3.3	Testing
6.3.5	Conclusions
6.4.0	Control Room Habitability
6.5.1	ESF Atmosphere Cleanup Systems
6.6.0	Inservice Inspection of Class 2 and 3 Components
7.1.1	General
7.1.3	Design Criteria
7.2.1	System Description
7.2.5	Steam Generator Water Level Trip
7.2.6	Conclusions
7.3.0	Engineered Safety Features System
7.3.1	System Description
7.3.6	Conclusions
7.4.2	Safe Shutdown from Auxiliary Control Room
7.5.2	Post-Accident Monitoring System

Table 1, continued.
Topics Open in NUREG-0847 - Watts Bar Nuclear Plant Unit 2

Subsection	Title
7.7.8	Anticipated Transient Without Scram Mitigation System Actuation Circuitry (AMSAC)
7.8.1	Relief and Safety Valve Position Indication (II.D.3)
8.2.2	Compliance With GDC 17
8.3.1	Onsite AC Power System Compliance With GDC 17
8.3.3	Evaluation Findings
9.1.2	Spent Fuel Storage
9.1.3	Spent Fuel Pool Cooling and Cleanup System
9.1.4	Fuel Handling System
9.2.1	Essential Raw Cooling Water and Raw Cooling Water Systems
9.2.2	Component Cooling System (Reactor Auxiliaries Cooling Water System)
9.3.2	Process Sampling System
9.4.5	Engineered Safety Features Ventilation System
9.5.2	Communication Systems
9.5.4	Emergency Diesel Engine Fuel Oil Storage and Transfer System
9.5.6	Emergency Diesel Engine Starting Systems
9.5.7	Emergency Diesel Engine Lubricating Oil System
9.5.8	Emergency Diesel Engine Combustion Air Intake and Exhaust System
10.2.0	Turbine Generator
10.3.1	Main Steam Supply System (up to and including the Main Steam Isolation Valves)
10.3.4	Secondary Water Chemistry
10.4.4	Turbine Bypass System
11.1.0	Summary Description
11.4.0	Solid Waste Management System
11.5.0	Process and Effluent Radiological Monitoring and Sampling Systems
11.6.0	Evaluation Findings
11.7.0	NUREG-0737 Items
11.7.2	Primary Coolant Outside Containment (III.D.1.1)
12.1.0	General
12.2.0	Ensuring that Occupational Radiation Doses Are As Low As Reasonably Achievable
12.3.0	Radiation Sources
12.4.0	Radiation Protection Design Features
12.5.0	Dose Assessment

Table 1, continued.
Topics Open in NUREG-0847 - Watts Bar Nuclear Plant Unit 2

Subsection	Title
12.6.0	Health Physics Program
12.7.1	Plant Shielding (II.B.2)
12.7.2	High Range Incontainment Monitor (II.F.1(3))
12.7.3	Inplant Radioiodine Monitor (III.D.3.3)
13.1.3	Plant Staff Organization
13.3.1	Introduction
13.3.2	Evaluation of the Emergency Plan
13.3.3	Conclusions
13.4.0	Review and Audit
13.5.1	Administrative Procedures
13.6.0	Physical Security Plan
15.2.0	Normal Operation and Anticipated Transients
15.2.1	Loss of Cooling Transients
15.2.3	Change in Coolant Inventory Transients
15.2.4	Reactivity and Power Distribution Anomalies
15.3.1	Loss-of-Coolant Accident
15.3.2	Steamline Break
15.3.3	Feedwater System Pipe Break
15.3.4	Reactor Coolant Pump Rotor Seizure
15.3.5	Reactor Coolant Pump Shaft Break
15.4.1	Loss-of-Coolant Accident
15.4.2	Main Steamline Break Outside of Containment
15.4.3	Steam Generator Tube Rupture
15.4.4	Control Rod Ejection Accident
15.4.5	Fuel-Handling Accident
15.4.6	Failure of Small Line Carrying Coolant Outside Containment
15.4.7	Postulated Radioactive Releases as a Result of Liquid Tank Failures
16.0.0	Technical Specifications
18.1.0	General
18.2.0	Conclusions

Table 2.
Status of NUREG-0847 Review Topics
Watts Bar Nuclear Plant Unit 2

Subsection	Title	Resolved in NUREG-0847?*
1.0.0	Introduction and General Discussion	
1.1.0	Introduction	
1.1.1	Metrication	
1.1.2	Proprietary Information	
1.1.4	Additional Information	
1.2.0	General Design Description	
1.3.0	Comparison With Similar Facility Designs	
1.3.1	Comparison With the Sequoyah Nuclear Plant	
1.3.2	Comparison With Other Facilities	
1.4.0	Identification of Agents and Contractors	
1.5.0	Summary of Principal Review Matters	
1.6.0	Modifications to the Watts Bar Facility During the Course of NRC Review	
1.7.0	Summary of Outstanding Issues	
1.8.0	Confirmatory Issues	
1.9.0	License Conditions	
1.10.0	Unresolved Safety Issues	
2.0.0	Site Envelope	
2.1.0	Geography and Demography	
2.1.1	Site Location and Description	Yes
2.1.2	Exclusion Area Authority and Control	Yes
2.1.3	***Population Distribution***	***No***
2.1.4	***Conclusions***	***No***
2.2.0	Nearby Industrial, Transportation, and Military Facilities	
2.2.1	***Transportation Routes***	***No***
2.2.2	***Nearby Facilities***	***No***
2.2.3	***Conclusions***	***No***
2.3.0	Meteorology	
2.3.1	Regional Climatology	Yes
2.3.2	Local Meteorology	Yes
2.3.3	Onsite Meteorological Measurements Program	Yes

*Resolved means that a topic was previously reviewed and approved in NUREG-0847 or its supplements. No status is provided for administrative or descriptive topics.

Unresolved items are shown in bold italics.

Table 2, continued.
Status of NUREG-0847 Review Topics - Watts Bar Nuclear Plant Unit 2

Subsection	Title	Resolved in NUREG-0847?*
2.3.4	Short-Term (Accident) Atmospheric Diffusion Estimates	Yes
2.3.5	Long-Term (Routine) Diffusion Estimates	Yes
2.4.0	Hydrologic Engineering	
2.4.1	Introduction	Yes
2.4.2	Hydrologic Description	Yes
2.4.3	Flood Potential	Yes
2.4.4	Local Intense Precipitation in Plant Area	Yes
2.4.5	Roof Drainage	Yes
2.4.6	Ultimate Heat Sink	Yes
2.4.7	Groundwater	Yes
2.4.8	***Design Basis for Subsurface Hydrostatic Loading***	***No***
2.4.9	***Transport of Liquid Releases***	***No***
2.4.10	Flooding Protection Requirements and Technical Specifications	Yes
2.5.0	Geological, Seismological, and Geotechnical Engineering	Yes
2.5.1	Geology	Yes
2.5.2	Seismology	Yes
2.5.3	Surface Faulting	Yes
2.5.4	Stability of Subsurface Materials and Foundations	Yes
2.5.5	Stability of Slopes	Yes
2.5.6	Embankments and Dams	Yes
2.6.0	References	
3.0.0	Design of Structures, Components, Equipment, and Systems	
3.1.0	Introduction	
3.1.1	Conformance With General Design Criteria	Yes
3.1.2	Conformance With Industry Codes and Standards	Yes
3.2.0	Classification of Structures, Systems, and Components	Yes
3.2.1	Seismic Qualification	Yes
3.2.2	***System Quality Group Classification***	***No***
3.3.0	Wind and Tornado Loadings	
3.3.1	Wind Loading	Yes
3.3.2	Tornado Loading	Yes
3.4.0	Flood Level (Flood) Design	

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Unresolved items are shown in bold italics.

Table 2, continued.
Status of NUREG-0847 Review Topics - Watts Bar Nuclear Plant Unit 2

Subsection	Title	Resolved in NUREG-0847?*
3.4.1	Flood Protection	Yes
3.5.0	Missile Protection	
3.5.1	Missile Selection and Description	Yes
3.5.2	Structures, Systems, and Components To Be Protected From Externally Generated Missiles	Yes
3.5.3	Barrier Design Procedures	Yes
3.6.0	***Protection Against the Dynamic Effects Associated with the Postulated***	***No***
3.6.1	***Plant Design for Protection Against Postulated Piping Failures in Fluid***	***No***
3.6.2	Determination of Break Locations and Dynamic Effects Associated with the Postulated Rupture of Piping	Yes
3.6.3	Leak-Before-Break Evaluation Procedures	Yes
3.7.0	***Seismic Design***	***No***
3.7.1	***Seismic Input***	***No***
3.7.2	***Seismic Analysis***	***No***
3.7.3	***Seismic Subsystem Analysis***	***No***
3.7.4	Seismic Instrumentation	Yes
3.8.0	***Design of Seismic Category I Structures***	***No***
3.8.1	Steel Containment	Yes
3.8.2	Concrete and Structural Steel Internal Structures	Yes
3.8.3	***Other Seismic Category I Structures***	***No***
3.8.4	Foundations	Yes
3.9.0	Mechanical Systems and Components	
3.9.1	***Special Topics for Mechanical Components***	***No***
3.9.2	Dynamic Testing and Analysis of Systems, Components, and Equipment	Yes
3.9.3	***ASME Code Class 1, 2, and 3 Components, Component Structures, and***	***No***
3.9.4	Control Rod Drive Systems	Yes
3.9.5	Reactor Pressure Vessel Internals	Yes
3.9.6	***Inservice Testing of Pumps and Valves***	***No***
3.10.0	***Seismic and Dynamic Qualification of Seismic Category I Mechanical***	***No***
3.11.0	***Environmental Qualification of Mechanical and Electrical Equipment***	***No***

*Resolved means that a topic was previously reviewed and approved in NUREG-0847 or its supplements. No status is provided for administrative or descriptive topics.

Unresolved items are shown in bold italics.

Table 2, continued.
Status of NUREG-0847 Review Topics - Watts Bar Nuclear Plant Unit 2

Subsection	Title	Resolved in NUREG-0847?*
3.13.0	Threaded Fasteners - ASME Code Class 1, 2, and 3 [SRP TOC]	
4.0.0	Reactor	
4.1.0	Introduction	
4.2.0	Fuel System Design	
4.2.1	***Description***	***No***
4.2.2	***Thermal Performance***	***No***
4.2.3	***Mechanical Performance***	***No***
4.2.4	Surveillance	Yes
4.2.5	***Fuel Design Conclusions***	***No***
4.3.0	Nuclear Design	
4.3.1	***Design Basis***	***No***
4.3.2	***Design Description***	***No***
4.3.3	***Analytical Methods***	***No***
4.3.4	***Summary of Evaluation Findings***	***No***
4.4.0	Thermal-Hydraulic Design	
4.4.1	Perfomance in Safety Criteria	Yes
4.4.2	***Design Bases***	***No***
4.4.3	***Thermal-Hydraulic Design Methodology***	***No***
4.4.4	***Operating Abnormalities***	***No***
4.4.5	***Loose Parts Monitoring System***	***No***
4.4.6	Thermal-Hydraulic Comparison	Yes
4.4.7	N-1 Loop Operation	Yes
4.4.8	***Instrumentation for Inadequate Core Cooling Detection (II.F.2)***	***No***
4.4.9	***Summary and Conclusion***	***No***
4.5.0	Reactor Materials	
4.5.1	Control Rod Drive Structural Materials	Yes
4.5.2	Reactor Internals and Core Support Materials	Yes
4.6.0	Functional Design of Reactivity Control Systems	Yes
5.0.0	Reactor Coolant System and Connected Systems	
5.1.0	***Summary Description***	***No***
5.2.0	Integrity of Reactor Coolant Pressure Boundary	
5.2.1	Compliance With Codes and Code Cases	Yes

*Resolved means that a topic was previously reviewed and approved in NUREG-0847 or its supplements. No status is provided for administrative or descriptive topics.

Unresolved items are shown in bold italics.

Table 2, continued.
Status of NUREG-0847 Review Topics - Watts Bar Nuclear Plant Unit 2

Subsection	Title	Resolved in NUREG-0847?*
5.2.2	Overpressure Protection	Yes
5.2.3	Reactor Coolant Pressure Boundary Materials	Yes
5.2.4	***RCS Pressure Boundary Inservice Inspection and Testing***	***No***
5.2.5	***Reactor Coolant Pressure Boundary Leakage Detection***	***No***
5.2.6	Reactor Vessel and Internals Modelling	
5.3.0	Reactor Vessel	
5.3.1	***Reactor Vessel Materials***	***No***
5.3.2	***Pressure-Temperature Limits***	***No***
5.3.3	***Reactor Vessel Integrity***	***No***
5.4.0	Component and Subsystem Design	
5.4.1	Reactor Coolant Pumps	Yes
5.4.2	Steam Generators	Yes
5.4.3	***Residual Heat Removal System***	***No***
5.4.4	Pressurizer Relief Tank	Yes
5.4.5	Reactor Coolant System Vents (II.B.1)	Yes
6.0.0	Engineered Safety Features	
6.1.0	Engineered Safety Features Materials	
6.1.1	Metallic Materials	Yes
6.1.2	Organic Materials	Yes
6.1.3	Postaccident Emergency Cooling Water Chemistry	Yes
6.2.0	Containment Systems	
6.2.1	***Containment Functional Design***	***No***
6.2.2	***Containment Heat Removal Systems***	***No***
6.2.3	Secondary Containment Functional Design	Yes
6.2.4	Containment Isolation System	Yes
6.2.5	***Combustible Gas Control Systems***	***No***
6.2.6	***Containment Leakage Testing***	***No***
6.2.7	Fracture Prevention of Containment Pressure Boundary	Yes
6.3.0	Emergency Core Cooling System	Yes
6.3.1	***System Design***	***No***
6.3.2	***Evaluation***	***No***
6.3.3	***Testing***	***No***

*Resolved means that a topic was previously reviewed and approved in NUREG-0847 or its supplements. No status is provided for administrative or descriptive topics.

Unresolved items are shown in bold italics.

Table 2, continued.
Status of NUREG-0847 Review Topics - Watts Bar Nuclear Plant Unit 2

Subsection	Title	Resolved in NUREG-0847?*
6.3.4	Performance Evaluation	Yes
6.3.5	***Conclusions***	***No***
6.4.0	***Control Room Habitability***	***No***
6.5.0	Engineered Safety Feature (ESF) Filter Systems	
6.5.1	***ESF Atmosphere Cleanup Systems***	***No***
6.5.2	Fission Product Cleanup System	Yes
6.5.3	Fission Product Control System	Yes
6.5.4	Ice Condenser as a Fission Product Control System	Yes
6.6.0	***Inservice Inspection of Class 2 and 3 Components***	***No***
7.0.0	Instrumentation and Controls	
7.1.0	Introduction	
7.1.1	***General***	***No***
7.1.2	Comparison with Other Plants	Yes
7.1.3	***Design Criteria***	***No***
7.2.0	Reactor Trip System	Yes
7.2.1	***System Description***	***No***
7.2.2	Manual Trip Switches	Yes
7.2.3	Testing of Reactor Trip Breaker Shunt Coils	Yes
7.2.4	Anticipatory Trips	Yes
7.2.5	***Steam Generator Water Level Trip***	***No***
7.2.6	***Conclusions***	***No***
7.3.0	***Engineered Safety Features System***	***No***
7.3.1	***System Description***	***No***
7.3.2	Containment Sump Level Measurement	Yes
7.3.3	Auxiliary Feedwater Initiation and Control	Yes
7.3.4	Failure Modes and Effects Analysis	Yes
7.3.5	IE Bulletin 80-06	Yes
7.3.6	***Conclusions***	***No***
7.4.0	Systems Required for Safe Shutdown	
7.4.1	System Description	Yes
7.4.2	***Safe Shutdown from Auxiliary Control Room***	***No***
7.4.3	Conclusions	Yes

*Resolved means that a topic was previously reviewed and approved in NUREG-0847 or its supplements. No status is provided for administrative or descriptive topics.

Unresolved items are shown in bold italics.

Table 2, continued.
Status of NUREG-0847 Review Topics - Watts Bar Nuclear Plant Unit 2

Subsection	Title	Resolved in NUREG-0847?*
7.5.0	Safety-Related Display Instrumentation	
7.5.1	System Description	Yes
7.5.2	***Post-Accident Monitoring System***	***No***
7.5.3	IE Bulletin 79-27	Yes
7.5.4	Conclusions	Yes
7.6.0	All Other Systems Required for Safety	
7.6.1	System Description	Yes
7.6.2	Residual Heat Removal System Bypass Valves	Yes
7.6.3	Upper Head Injection Manual Control	Yes
7.6.4	Protection Against Spurious Actuation of Motor-Operated Valves	Yes
7.6.5	Overpressure Protection During Low Temperature Operation	Yes
7.6.6	Valve Power Lockout	Yes
7.6.7	Cold Leg Accumulator Valve Interlocks and Position Indication	Yes
7.6.8	Automatic Switchover From Injection to Recirculation Mode	Yes
7.6.9	Conclusions	Yes
7.7.0	Control Systems Not Required for Safety	
7.7.1	System Description	Yes
7.7.2	Safety System Status Monitoring System	Yes
7.7.3	Volume Control Tank Level Control System	Yes
7.7.4	Pressurizer and Steam Generator Overfill	Yes
7.7.5	IE Information Notice 79-22	Yes
7.7.6	Multiple Control System Failures	Yes
7.7.7	Conclusions	Yes
7.7.8	***Anticipated Transient Without Scram Mitigation System Actuation***	***No***
7.8.0	NUREG-0737 Items	Yes
7.8.1	***Relief and Safety Valve Position Indication (II.D.3)***	***No***
7.8.2	Auxiliary Feedwater System Initiation and Flow Indication (II.E.1.2)	Yes
7.8.3	Proportional Integral Derivative Control Modification (II.K.3.9)	Yes
7.8.4	Proposed Anticipatory Trip Modification (II.K.3.10)	Yes
7.8.5	Confirm Existence of Anticipatory Reactor Trip Upon Turbine Trip (II.K.3.12)	Yes
7.9.0	Data Communication Systems	

*Resolved means that a topic was previously reviewed and approved in NUREG-0847 or its supplements. No status is provided for administrative or descriptive topics.

Unresolved items are shown in bold italics.

Table 2, continued.
Status of NUREG-0847 Review Topics - Watts Bar Nuclear Plant Unit 2

Subsection	Title	Resolved in NUREG-0847?*
8.0.0	Electric Power Systems	
8.1.0	General	Yes
8.2.0	Offsite Power System	
8.2.1	Compliance With GDC 5	Yes
8.2.2	***Compliance With GDC 17***	***No***
8.2.3	Compliance With GDC 18	Yes
8.2.4	Evaluation Findings	Yes
8.3.0	Onsite Power Systems	Yes
8.3.1	***Onsite AC Power System Compliance With GDC 17***	***No***
8.3.2	Onsite DC System Compliance With GDC 17	Yes
8.3.3	***Evaluation Findings***	***No***
8.4.0	Station Blackout	
9.0.0	Auxiliary Systems	Yes
9.1.0	Fuel Storage Facility	
9.1.1	New Fuel Storage	Yes
9.1.2	***Spent Fuel Storage***	***No***
9.1.3	***Spent Fuel Pool Cooling and Cleanup System***	***No***
9.1.4	***Fuel Handling System***	***No***
9.2.0	Water Systems	
9.2.1	***Essential Raw Cooling Water and Raw Cooling Water Systems***	***No***
9.2.2	***Component Cooling System (Reactor Auxiliaries Cooling Water System)***	***No***
9.2.3	Demineralized Water Makeup System	Yes
9.2.4	Potable and Sanitary Water Systems	Yes
9.2.5	Ultimate Heat Sink	Yes
9.2.6	Condensate Storage Facilities	Yes
9.3.0	Process Auxiliaries	
9.3.1	Compressed Air System	Yes
9.3.2	***Process Sampling System***	***No***
9.3.3	Equipment and Floor Drainage System	Yes
9.3.4	Chemical and Volume Control System	Yes
9.4.0	Heating, Ventilation, and Air Conditioning Systems	
9.4.1	Control Room Area Ventilation System	Yes

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Table 2, continued.
Status of NUREG-0847 Review Topics - Watts Bar Nuclear Plant Unit 2

Subsection	Title	Resolved in NUREG-0847?*
9.4.2	Fuel Handling Area Ventilation System	Yes
9.4.3	Auxiliary and Radwates Area Ventilation System	Yes
9.4.4	Turbine Building Area Ventilation System	Yes
9.4.5	***Engineered Safety Features Ventilation System***	***No***
9.5.0	Other Auxiliary Systems	
9.5.1	Fire Protection	Yes
9.5.2	***Communication Systems***	***No***
9.5.3	Lighting System	Yes
9.5.4	***Emergency Diesel Engine Fuel Oil Storage and Transfer System***	***No***
9.5.5	Emergency Diesel Engine Cooling Water System	Yes
9.5.6	***Emergency Diesel Engine Starting Systems***	***No***
9.5.7	***Emergency Diesel Engine Lubricating Oil System***	***No***
9.5.8	***Emergency Diesel Engine Combustion Air Intake and Exhaust System***	***No***
10.0.0	Steam and Power Conversion System	
10.1.0	Summary Description	Yes
10.2.0	***Turbine Generator***	***No***
10.2.1	Turbine Generator Design	Yes
10.2.2	Turbine Disc Integrity	Yes
10.3.0	Main Steam Supply System	Yes
10.3.1	***Main Steam Supply System (up to and including the Main Steam***	***No***
10.3.2	Main Steam Supply System	Yes
10.3.3	Steam and Feedwater System Materials	Yes
10.3.4	***Secondary Water Chemistry***	***No***
10.4.0	Other Features	
10.4.1	Main Condenser	Yes
10.4.2	Main Condenser Evacuation System	Yes
10.4.3	Turbine Gland Sealing System	Yes
10.4.4	***Turbine Bypass System***	***No***
10.4.5	Condenser Circulating Water System	Yes
10.4.6	Condensate Cleanup System	Yes
10.4.7	Condensate and Feedwater Systems	Yes

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Table 2, continued.
Status of NUREG-0847 Review Topics - Watts Bar Nuclear Plant Unit 2

Subsection	Title	Resolved in NUREG-0847?*
10.4.8	Steam Generator Blowdown System	Yes
10.4.9	Auxiliary Feedwater System	Yes
11.0.0	Radioactive Waste Management	
11.1.0	***Summary Description***	***No***
11.2.0	Liquid Waste Management	Yes
11.3.0	Gaseous Waste Management	Yes
11.4.0	***Solid Waste Management System***	***No***
11.5.0	***Process and Effluent Radiological Monitoring and Sampling Systems***	***No***
11.6.0	***Evaluation Findings***	***No***
11.7.0	***NUREG-0737 Items***	***No***
11.7.1	Wide Range Noble Gas, Iodine, and Particulate Effluent Monitors (II.F.1(1) and II.F.1(2))	Yes
11.7.2	***Primary Coolant Outside Containment (III.D.1.1)***	***No***
12.0.0	Radiation Protection	
12.1.0	***General***	***No***
12.2.0	***Ensuring that Occupational Radiation Doses Are As Low As Reasonably***	***No***
12.3.0	***Radiation Sources***	***No***
12.4.0	***Radiation Protection Design Features***	***No***
12.5.0	***Dose Assessment***	***No***
12.6.0	***Health Physics Program***	***No***
12.7.0	NUREG-0737 Items	
12.7.1	***Plant Shielding (II.B.2)***	***No***
12.7.2	***High Range Incontainment Monitor (II.F.1(3))***	***No***
12.7.3	***Inplant Radioiodine Monitor (III.D.3.3)***	***No***
13.0.0	Conduct of Operations	
13.1.0	Organizational Structure of the Applicant	Yes
13.1.1	Management and Technical Organization	Yes
13.1.2	Corporate Organization and Technical Support	Yes
13.1.3	***Plant Staff Organization***	***No***
13.2.0	Training	
13.2.1	Licensed Operator Training Program	Yes

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Table 2, continued.
Status of NUREG-0847 Review Topics - Watts Bar Nuclear Plant Unit 2

Subsection	Title	Resolved in NUREG-0847?*
13.2.2	Training for Nonlicensed Personnel	Yes
13.3.0	Emergency Preparedness Evaluation	
13.3.1	***Introduction***	***No***
13.3.2	***Evaluation of the Emergency Plan***	***No***
13.3.3	***Conclusions***	***No***
13.4.0	***Review and Audit***	***No***
13.5.0	Plant Procedures	
13.5.1	***Administrative Procedures***	***No***
13.5.2	Operating and Maintenance Procedures	Yes
13.5.3	NUREG-0737 Items	Yes
13.6.0	***Physical Security Plan***	***No***
13.6.1	Physical Security Organization	
13.6.2	Physical Barriers	
13.6.3	Access Requirements	
13.6.4	Detection Aids	
13.6.5	Communications	
13.6.6	Test and Maintenance Requirements	
13.6.7	Response Requirements	
13.6.8	Personnel Reliability	
13.6.9	Land Vehicle Bomb Control Program	
14.0.0	Initial Test Program	Yes
15.0.0	Accident Analysis	
15.1.0	General Discussion	Yes
15.2.0	***Normal Operation and Anticipated Transients***	***No***
15.2.1	***Loss of Cooling Transients***	***No***
15.2.2	Increased Cooling Transients	Yes
15.2.3	***Change in Coolant Inventory Transients***	***No***
15.2.4	***Reactivity and Power Distribution Anomalies***	***No***
15.2.5	Conclusions	Yes
15.3.0	Limiting Accidents	Yes
15.3.1	***Loss-of-Coolant Accident***	***No***
15.3.2	***Steamline Break***	***No***

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Table 2, continued.
Status of NUREG-0847 Review Topics - Watts Bar Nuclear Plant Unit 2

Subsection	Title	Resolved in NUREG-0847?*
15.3.3	***Feedwater System Pipe Break***	***No***
15.3.4	***Reactor Coolant Pump Rotor Seizure***	***No***
15.3.5	***Reactor Coolant Pump Shaft Break***	***No***
15.3.6	Anticipated Transients Without Scram	Yes
15.3.7	Conclusions	Yes
15.4.0	Radiological Consequences of Accidents	Yes
15.4.1	***Loss-of-Coolant Accident***	***No***
15.4.2	***Main Steamline Break Outside of Containment***	***No***
15.4.3	***Steam Generator Tube Rupture***	***No***
15.4.4	***Control Rod Ejection Accident***	***No***
15.4.5	***Fuel-Handling Accident***	***No***
15.4.6	***Failure of Small Line Carrying Coolant Outside Containment***	***No***
15.4.7	***Postulated Radioactive Releases as a Result of Liquid Tank Failures***	***No***
15.5.0	NUREG-0737 Items	
15.5.1	Thermal Mechanical Report (II.K.2.13)	Yes
15.5.2	Voiding in the Reactor Coolant System During Transients (II.K.2.17)	Yes
15.5.3	Installation and Testing of Automatic Power-Operated Relief Valve Isolation System (II.K.3.1), Report on Overall Safety Effect of Power-Operated Relief Valve Isolation System (II.K.3.2)	Yes
15.5.4	Automatic Trip of Reactor Coolant Pumps (II.K.3.5)	Yes
15.5.5	Small-Break LOCA Methods (II.K.3.30) and Plant-Specific Calculations (II.K.3.31)	Yes
15.6.0	Relative Risk of Low Power Operation	Yes
16.0.0	***Technical Specifications***	***No***
17.0.0	Quality Assurance	
17.1.0	General	Yes
17.2.0	Organization	Yes
17.3.0	Quality Assurance Program	Yes
17.4.0	Conclusions	Yes
17.6.0	Maintenance Rule	
18.0.0	Control Room Design Review	
18.1.0	***General***	***No***
18.2.0	***Conclusions***	***No***

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Table 2, continued.
Status of NUREG-0847 Review Topics - Watts Bar Nuclear Plant Unit 2

Subsection	Title	Resolved in NUREG-0847?*
19.0.0	Report of the Advisory Committee on Reactor Safeguards	
20.0.0	Common Defense and Security	
21.0.0	Financial Qualifications	
22.0.0	Financial Protection and Indemnity Requirements	
22.1.0	General	
22.2.0	Preoperational Storage of Nuclear Fuel	
22.3.0	Operating Licenses	
23.0.0	Conclusions	
24.0.0	Overall Assessment of the Quality of Construction, Operational Readiness, and Quality Assurance Effectiveness of Watts Bar Unit 1	
24.1.0	Introduction	
24.1.1	Purpose of the Assessment	
24.1.2	Organization of the Chapter	
24.2.0	Historical Overview of Construction Problems	
24.3.0	Employee Concerns Programs	
24.3.1	The Employee Concerns Special Program	
24.3.2	Concerns Resolution Program	
24.3.3	Conclusion	
24.4.0	Recovery Plan	
24.4.1	Nuclear Performance Plans	
24.4.2	Corrective Action Program Plans and Special Programs	
24.4.3	Conclusion	
24.5.0	Significant Regulatory Issues	
24.5.1	Welding	
24.5.2	Electrical Cable Damage	
24.5.3	Quality Assurance Records	
24.5.4	Conclusion	
24.6.0	Additional Activities	
24.6.1	NRC Corrective Actions to Improve Its Regulatory Oversight	
24.6.2	Special Inspections	
24.6.3	Conclusion	
24.7.0	Construction Stopped	

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Table 2, continued.
Status of NUREG-0847 Review Topics - Watts Bar Nuclear Plant Unit 2

Subsection	Title	Resolved in NUREG-0847?*
24.7.1	Corrective Action Problems After Construction Restart	
24.7.2	Strengthening the QA Organization	
24.7.3	Conclusion	
24.8.0	Integrated Assurance of Acceptable Construction Quality	
24.8.1	Preoperational Testing	
24.8.2	Program for Assurance of Completion and Assurance of Quality	
24.8.3	TVA's Integrated Design Inspection	
24.8.4	Licensing Review	
24.8.5	Reconstitution of Construction Inspection Program	
24.8.6	Conclusion	
24.11.0	TVA's Operational Readiness	
24.11.1	TVA's Activities To Demonstrate Operational Readiness	
24.11.2	NRC's Activities to Substantiate Operational Readiness	
24.11.3	Lessons Learned From Other NTOLs Applied to Watts Bar Unit 1	
24.11.4	Conclusion	
24.12.0	NRC's Overall Assessment	
24.12.1	TVA's Employee Concern Program	
24.12.2	Construction Quality of Watts Bar Unit 1	
24.12.3	TVA's Qualifications to Operate Watts Bar Unit 1 Safely	
24.12.4	Conclusion	
25.0.0	Nuclear Performance Plan	
25.1.0	Introduction	
25.2.0	Corrective Actions	
25.2.1	Cable Issues	
25.2.2	Cable Tray and Tray Supports	
25.2.3	Design Baseline and Verification Program	
25.2.4	Electrical Conduit and Conduit Support	
25.2.5	Electrical Issues	
25.2.6	Equipment Seismic Qualification	
25.2.7	Fire Protection	
25.2.8	Hanger and Analysis Update Program	
25.2.9	Heat Code Traceability	

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Table 2, continued.
Status of NUREG-0847 Review Topics - Watts Bar Nuclear Plant Unit 2

Subsection	Title	Resolved in NUREG-0847*
25.2.10	Heating, Ventilation, and Air-Conditioning Duct and Duct Supports	
25.2.11	Instrument Lines	
25.2.12	Prestart Test Program	
25.2.13	QA Records	
25.2.14	Q-List	
25.2.15	Replacement Items Program (Piece Parts)	
25.2.16	Seismic Analysis	
25.2.17	Vendor Information Program	
25.2.18	Welding	
25.3.0	Special Programs	
25.3.1	Concrete Quality Program	
25.3.2	Containment Cooling	
25.3.3	Detailed Control Room Design Review	
25.3.4	Environmental Qualification Program	
25.3.5	Master Fuse List	
25.3.6	Mechanical Equipment Qualification	
25.3.7	Microbiologically Induced Corrosion (MIC)	
25.3.8	Moderate Energy Line Break Flooding	
25.3.9	Radiation Monitoring System	
25.3.10	Soil Liquefaction	
25.3.11	Use-as-is CAQs	
25.4.0	Implementation, Verification, and Closure of Corrective Actions	
25.4.1	Corrective Action Program Plans and Special Programs	
25.4.2	Quality Verification Process	
25.5.0	Management and Organization	
25.5.1	Introduction	
25.5.2	Organizational and Management Improvements	
25.5.3	Conclusions	
25.6.0	Operational Readiness	
25.7.0	Employee Concerns	
25.8.0	Allegations	
26.0.0	Generic Issues	

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Table 2, continued.
Status of NUREG-0847 Review Topics - Watts Bar Nuclear Plant Unit 2

Subsection	Title	Resolved in NUREG-0847?*
27.0.0	NUREG-0737 TMI Action Items	
28.0.0	Other Regulatory Topics	
28.1.0	License Conditions	
28.2.0	Orders	
	Appendix A - Chronology of Radiological Review of Watts Bar Nuclear Plant Units 1 and 2, Operating License Review	
	Appendix B - Bibliography	
	Appendix C - Nuclear Regulatory Commission Unresolved Safety Issues	
	Appendix D - Evaluation of the Applicant's Control Room Design	
	Appendix E - Principal Contributors	
	Appendix F - Abbreviations	

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Using the results of NRC's assessment, TVA should revise its regulatory framework status to match the staff's current reconciliation and assessment. In particular, TVA should maintain the list of open items from Table 2 and then update the information as actions are completed, proper documentation submitted to the NRC staff for review, and the NRC staff documents its review and acceptance in an SER Supplement. If TVA or the NRC staff determines that a previously reviewed and completed item needs to be re-opened, TVA should add the item to the list and highlight this action as having occurred. TVA is also requested to provide an update to the status, including references to TVA and NRC supporting documentation, at least every 6 months. The NRC staff will use this information to verify the completion of open actions and to coordinate the need for independent validation of implementation through inspections.

If you have questions regarding the staff's assessment or actions requested of TVA, please contact me at 301-415-1457.

Sincerely,

/RA/

Patrick D. Milano, Senior Project Manager
Watts Bar Special Projects Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-391

Enclosures:
Tables 1 and 2, Regulatory Framework Status
for TVA Watts Bar Unit 2

cc w/encls: See next page

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