U.S. NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR REACTOR REGULATION (NRR)

AUDIT REPORT

ON

IMPLEMENTATION OF GENERIC LETTER (GL) 98-01

"YEAR 2000 READINESS OF COMPUTER SYSTEMS AT NUCLEAR POWER PLANTS"

Docket No:	50-390
License No:	NPF-90
Licensee:	Tennessee Valley Authority (TVA)
Facility:	Watts Bar Nuclear Plant
Location:	Spring City, TN
Dates:	November 16 - 19, 1998
Audit Team Members:	Michael Waterman, NRR Mario Gareri, NRR Norman Merriweather, DRS, Region II
Approved by:	Jared Wermiel, Chief Instrumentation and Controls Branch Office of Nuclear Reactor Regulation

ENCLOSURE

EXECUTIVE SUMMARY

From November 16 through 19, 1998, the U. S. Nuclear Regulatory Commission (NRC) staff conducted an audit of the Year 2000 (Y2K) readiness program at the Watts Bar Nuclear Plant (WBN) in accordance with the audit plan for this activity. The purpose of the audit was to (1) assess the effectiveness of the Tennessee Valley Authority Nuclear (TVAN), the licensee program for achieving Y2K readiness, including continued safe operation of the plant as well as compliance with applicable NRC regulations and license conditions with respect to potential Y2K problems, (2) evaluate Y2K program implementation to assure that the licensee's schedule is in accordance with NRC Generic Letter (GL) 98-01 guidelines for achieving Y2K readiness by July 1, 1999, and (3) assess the licensee's contingency plans for addressing risks associated with potential events resulting from Y2K problems. The audit team reviewed selected licensee documentation regarding the TVAN Y2K readiness program and conducted interviews with the cognizant licensee personnel. The results of this audit and subsequent audits at other selected plants will be used by the staff to determine the need for additional action, if any, on Y2K readiness for nuclear power plants.

Based on the staff's assessment and evaluation of the TVAN Y2K readiness program, the following observations were made:

1. TVAN has a common Y2K project implementation plan for all its nuclear facilities The TVAN Y2K project plan establishes the scope and control of the Y2K Project Plan at the WBN plant. The Y2K Project Plan is comprehensive and incorporates the major elements of the nuclear power industry Y2K problem guidance contained in Nuclear Energy Institute (NEI)/Nuclear Utilities Software Management Group (NUSMG) 97-07, "Nuclear Utility Year 2000 Readiness."

2. The TVAN Y2K program is receiving appropriate management support and oversight at the WBN plant. TVAN sponsorship for the Y2K program is aggressive.

3. The licensee began the formal WBN Y2K readiness program in December 1997, and finished the plant inventory and initial assessment phase on March 5, 1998. The detailed assessment phase for systems and components that are mission critical or important to operations is scheduled to be completed by December 31, 1998. The licensee has established a tightly-controlled schedule for completing Y2K readiness of critical applications and systems by May 1, 1999, and all systems will be Y2K ready by June 1, 1999. The Y2K readiness schedule appears to be achievable because of the dedicated effort at this site, the fact that the licensee has already begun modification or replacement of major critical computer systems, and the licensee has received support via information sharing with EPRI, other licensees, the Southeast Electricity Reliability Council, and the North American Electric Reliability Council.

4. The licensee has started the WBN Y2K contingency planning. The licensee is using the nuclear industry guidance in NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning," for this effort and is in the process of integrating contingency planning in the TVAN Year 2000 Project Plan. The TVAN Contingency Plan is scheduled for completion on March 31, 1999.

5. The licensee is conducting confirmatory testing of mission critical system Y2K compliance at the plant site for those systems and applications not certified by vendors on the licensee's approved supplier's list.

6. The licensee's independent assessment of the TVAN Y2K project plan was in the planning stage at the time of this audit. Recommendations from that assessment will be addressed by the WBN Y2K project team for subsequent revisions of the TVAN Y2K project plan.

7. Materials management is being addressed by the licensee. The licensee recognizes that the Y2K checks and balances now in place should be proceduralized for future materiel control.

8. In addition to tracking the Y2K readiness status of each application and system, the licensee also tracks the Y2K readiness status of the affected plant systems (e.g., Main Steam System, High Pressure Injection System, Reactor Protection System), and provides a cross reference to applicable application and system Y2K readiness packages. This provides the licensee with important plant system operability status information.

1.0   INTRODUCTION

The objectives of the WBN Y2K readiness program audit were to:

1.   Assess the effectiveness of the TVAN program for achieving Y2K readiness, including continued safe operation of the WBN plant as well as compliance with applicable NRC regulations and license conditions with respect to potential Y2K problems,

2.   Evaluate Y2K program implementation to assure that the licensee's schedule is in accordance with NRC Generic Letter (GL) 98-01 guidelines for achieving Y2K readiness by July 1, 1999, and,

3.   Assess the licensee's contingency plans for addressing risks associated with potential events resulting from Y2K problems.

The audit was conducted in accordance with the established audit plan outline (Attachment 1) which was based in part on the guidance and requirements contained in the following documents:

- GL 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants"

- Licensee Response(s) to GL 98-01

- Plant technical specifications and license terms and conditions

- Applicable NRC regulations

- NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness"

- NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning"

Prior to the audit at the plant site, the audit team obtained and reviewed the TVAN Y2K Project Plan, Rev. 2.2, dated October 30, 1998. (Document Number 2 listed in Attachment 2).

The audit process started with an entrance meeting attended by the TVAN Year 2000 Project Manager (PM), Y2K project team members, senior and other site personnel, and members of the audit team. Attachment 3 is a list of the attendees. The WBN Y2K Project Coordinator described project organization, the project plan and its implementation, project status, and ongoing activities.

Following the meeting, the audit team spent the rest of the audit reviewing the TVAN project plan and its associated procedures, the plan implementation products (documents and data bases), and interacted with the Y2K Project Coordinator, WBN Y2K project team members, and members of the TVAN Y2K project team. The documents reviewed and referenced in this audit are listed in Attachment 2.

2.0 WATTS BAR Y2K PROJECT DESCRIPTION

2.1 Project Organization

The TVAN Y2K readiness program at WBN has 14 full-time equivalent persons supporting the WBN part of the TVAN Y2K project. The WBN project coordinator (PC) for the WBN part of the TVAN Y2K project is Mr. D. Olcsvary. The PC reports to the WBN Business and Work Performance Manager (Mr. N. D. Nelson), who reports to the WBN Site Vice President (Mr. R. Purcell). The Site Vice President reports to the WBN Y2K project sponsor, Mr. J. Bailey, who is the TVAN Vice President of Engineering and Technical Services. Mr. Bailey reports to the Chief Operating Officer of TVA, Mr. O. Zeringue. The PC stated that the sponsoring efforts have been important to the success of the TVAN Y2K program.

The licensee participates with other organizations that are addressing the Y2K problem. The licensee has received support via participation in the EPRI Y2K program and workshops, sharing information with other licensees and NEI/NUSMG, assessments of other licensees, the Southeast Electricity Reliability Council, and the North American Electricity Reliability Council.

2.2 Project Plan

The TVAN Y2K project plan (Item 2 of Documents Reviewed) was developed by the licensee to establish the scope and control of the Y2K program, and is applied uniformly at every TVA nuclear power plant. The TVAN Y2K project plan is based on the guidance provided in NEI/NUSMG 97-07, which was accepted by the NRC in NRC Generic Letter 98-01 as guidance that presents one approach for achieving Y2K readiness. The audit team's review confirmed that the TVAN Y2K project plan is based on the guidance contained in NEI/NUSMG 97-07.

The TVAN Y2K project plan consists of three major phases; Awareness and Initial Assessment, Detailed Assessment, and Y2K Certification. The Awareness and Initial Assessment Phase comprises communications with the TVAN organization concerning the Y2K issue and its importance; inventory of all potentially affected items; categorization of the identified items to assign resources for classifying and prioritizing activities; prioritization of remediation activities; and system assessments to verify interfaces between systems. The Detailed Assessment Phase comprises the elements of source code examinations; assessing vendor and industry group certifications and test results; and conducting testing. The Y2K Certification Phase comprises the elements of vendor evaluations with regard to remediations; contingency planning; and documentation closure and record keeping. The schedule of TVAN Y2K readiness efforts at WBN is provided in Table 1.

2.2.1 Awareness

The TVAN Y2K program, which addresses all TVA nuclear plants, was begun on December 3, 1997. The TVAN Communication Plan, dated December 22, 1997, prescribes actions for briefing TVAN management, educating the general population of TVAN personnel via departmental newsletters, training personnel who are to perform inventory and assessment activities, and coordinating Y2K team communications. Based on communications reviewed by the audit team, the staff concluded that TVAN has an effective Y2K awareness program.

2.2.2 Initial Assessment

The Awareness and Initial Assessment Phase comprises communications with the TVAN organization concerning the Y2K issue and its importance; inventory of all potentially affected items; categorization of the identified items to assign resources for classifying and prioritizing activities; prioritization of remediation activities; and system assessments to verify interfaces between systems.

The initial assessment part of the Awareness and Initial Assessment Phase started on December 3, 1997, and was completed on March 5, 1998. The completed initial assessment resulted in the identification of an inventory of the software applications and embedded system components at WBN. The inventory of potentially affected applications and embedded plant systems/components was developed by plant personnel familiar with each plant system/functional area. Some software systems were evaluated by the TVA (corporate) Y2K project team, which supports the TVAN Y2K project team.

In the identification of embedded systems, the licensee reviewed the procedures and documentation for the existence of an internal clock or processor, surveyed the vendors for information on their equipment, performed system walk-downs, and reviewed schematics, program listings, and reference manuals on various instrumentation and control systems. The results of the initial assessment of the software applications and embedded items were placed in the TVAN Y2K data base.

The licensee identified 605 potentially affected systems and components at WBN, including 154 software applications, 295 digital components/devices, and 156 spare parts components. Assessment/testing has been completed for 99 of the 137 mission critical software applications, embedded devices, and spare parts identified by the licensee. Assessment/testing has been completed for 172 of the 273 software applications, digital devices and spare components important to operations. Of the 195 items the licensee considers desirable for Y2K assessment/testing, 105 items have been completed. The balance of the systems and components in these categories is undergoing continued detailed assessment/testing.

The inventory includes a prioritization of the identified items. The priorities are based on mission criticality and importance of the functions being performed. The licensee defines as mission critical those systems or components that directly impact nuclear safety, power production, or current licensing bases. The licensee used risk assessment methods to prioritize each inventoried item as either mission critical, important to operations, or desirable for achieving Y2K readiness or compliance. Mission critical items must be verified to be Y2K compliant or ready by the deadline date. Many items important to operations will be verified to be Y2K compliant or ready by the deadline date. Desirable items are discretionary items that may be verified to be Y2K compliant or ready by the deadline date. The licensee's prioritization process encompasses the criteria described in NEI/NUSMG 97-07.

Table 2 lists the prioritization of the inventoried software applications. Table 3 provides a list of mission critical software systems reviewed by the audit team. Table 4 lists the distribution of embedded devices in the three priority classes. Table 5 lists the embedded devices that were reviewed by the audit team.

The licensee completed the inventory identification (analysis of the initial assessment) on April 15, 1998. During the analysis of the initial assessment, the licensee evaluated the failure risk of each item as the basis for assigning the priority; recommended the approach/plan for detailed

assessment, testing, and remediation; and estimated the detailed assessment/remediation cost. Unless specifically noted otherwise, the licensee did not formally assess and remediate low priority items. Remediation of these items will be done as time and resources permit.

2.2.3. Detailed Assessment

Detailed assessments consist of source code examinations, review of vendor certifications and tests, testing systems in-house, and review of industry group certifications and tests. Vendor evaluations encompass evaluation of available manufacturer/developer information (such as contracts, correspondence, vendor manuals, Internet listings, and vendor owners groups), communications with vendors using the corporate vendor management program standard vendor questionnaire, and direct communication with vendors. Test evaluations involve the development of test procedures and acceptance criteria to determine whether a Y2K problem exists.

The licensee is scheduled to complete its detailed assessment of mission critical and important to operations items by December 31, 1998. The detailed assessments performed to date follow the project implementation plan. As with the Awareness and Initial Assessment Phase, the audit team found the licensee's documentation sufficient for justifying the results of the detailed assessments, which established Y2K compliance/non-compliance and readiness of systems.

2.2.4. Y2K Testing and Validation

Y2K problem susceptibility testing is based on the licensee's determination of the importance of the affected system and knowledge of the item, prior experience with the vendor, and other relevant information. Mission critical and important to operations systems and embedded devices provided by suppliers not on the licensee's approved
supplier list are tested by the licensee or through a Y2K testing contract regardless of vendor certification. The licensee's Y2K project team developed the onsite testing procedures to ensure consistency in the implementation of Y2K susceptibility testing.

When plant equipment is also present in the plant simulator, the simulator equipment is used as the base test equipment, and the plant equipment is then certified Y2K ready by its equivalence to the simulator equipment. The licensee does not use a formal procedure or process for establishing equivalence between the simulator equipment and/or redundant channels of plant equipment. Equipment and firmware technical manuals and data under configuration control is the most frequently used source of data for determining equivalence between redundant channels of equipment. The licensee has inspected some channels of equipment at the circuit board level; however, this is not the most common practice. The audit team found the licensee's use of available technical manuals and data to be acceptable.

The auditors found only minor documentation discrepancies in some test packages. For example, in WB-430, "Wind Speed Direction Recorder," the licensee signed off on the test results form prior to receiving final approval on the test plan. In another case, WB-433, "WATCHDOG," test procedures C.14, "Timer Test," and C.18, "Display Data Test," were not included in the Y2K package, but the test report summary form, "Combined Component Test Report Form," was marked as having passed these two tests. There were several other discrepancies, but all are isolated events and do not indicate a trend in Y2K certification practices or failure to properly identify Y2K problem susceptibility.

2.2.5. Certification and Remediation

Certification is the completion and documentation of Y2K readiness activities for individual systems and components. This includes documentation of validated system modifications and development of required contingency plans.

Remediation is the process of retiring, replacing or modifying software or embedded software devices that are to be retained in service, but have been determined to be affected by the Y2K problem. The program implementation plan provided Y2K compliance criteria for replacement or modification. After remediation is completed, validation testing is required. The licensee is performing the required Y2K remediation validation testing using the test procedures and test plans developed by the Y2K project. The resulting certifications are acceptable.

2.2.6. Regulatory Considerations

The TVAN Y2K project plan and associated documents include references to existing plant procedures that have guidance on regulatory considerations, such as applicability of 10 CFR 50.59 for plant modification reviews, reportability evaluations per 10 CFR 50.72, 10 CFR 50.73, and 10 CFR Part 21, and operability determinations as required by plant technical specifications.

2.2.7. Contingency Planning

The licensee has begun contingency planning using a framework similar to that described in NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning." The contingency plan for WBN mission critical systems and components is scheduled for completion on March 31, 1999. The proposed contingency planning activities are consistent with the guidance of NEI/NUSMG 98-07. The licensee's schedule for completion of the project contingency plans is realistic.

Communications within the TVA grid are on TVA-owned T1, T3, and microwave systems. The primary communication path between plants is a fiber optic T3 network, with the T1 system as a backup. The fiber optic lines are run on the transmission towers, which are owned by TVA. These networks are undergoing Y2K readiness evaluation, and are projected to be ready before the end of 1998. The licensee may communicate with each power producer using any of the above systems, thereby providing diversity in the communications capabilities. The licensee is also planning contingency actions for the unlikely event that all communications within the TVA grid are disrupted by Y2K failures.

2.2.8. Y2K Program Management

The licensee's Y2K program schedule is aggressively tracked on a continuous basis by corporate and site management. The Y2K program progress is summarized in a format that defines the progress of each Y2K system being evaluated. There have been no schedule slippages in the WBN Y2K program.

In addition to tracking the Y2K readiness status of each application and system, the licensee also tracks the Y2K readiness status of the affected plant systems (e.g., Main Steam System, High Pressure Injection System, Reactor Protection System), and provides a cross reference to applicable application and system Y2K readiness packages. This provides the licensee with important plant system operability status information.

2.2.9. Electric Grid Issues

The audit team discussed electric grid issues with the licensee. WBN provides power to the TVA grid interconnection, which is part of the Southeastern Electric Reliability Council (SERC), one region in the North American Electric Reliability Council (NERC). TVA has initiated activities to address grid reliability with respect to the Y2K problem. The net system load of the TVA system is approximately 27,000 MW, of which approximately 5,500 MW are produced by nuclear power plants. Over the past five years, the TVA system load has been less than 16,000 MW during the New Years Eve period. TVA centrally coordinates the operation of these power producers by monitoring the operating status of each power producer on the grid.

The TVA contingency plan for grid reliability and stability is based on the impact of changes in power production and the probability of changes in power production or demand. The contingency plans are intended to be consistent between power producers in the region to ensure the power producers will not adversely impact the grid. The contingency plans consider probable and credible worst-case scenarios for external as well as internal events. To ensure sufficient electrical energy resources are available, the TVA power producers are coordinating their Y2K planning efforts to determine the optimum loads to carry during the period of the Y2K changeover.

TVA developed a contingency plan for black starts. This procedure was issued on November 6, 1998. The black start procedure provides detailed instructions for starting each black start power source, connecting the load to the grid, and sequencing each power producer onto the grid as the grid stabilizes. TVA is conducting drills with each power producer to ensure the producers can operate independent of centralized control should communications become disrupted by the Y2K changeover. TVA will verify every black start unit is Y2K ready to ensure black start capabilities are available.

To ensure the grid is Y2K ready, TVA has inventoried each transmission line end-to-end to identify all equipment that could be potentially affected by Y2K events. TVA has assigned device leaders to each type of device associated with the major stations and lines in the TVA grid. In the component reviews, the device leaders have reviewed the Y2K readiness of each mission critical component.

The TVA transmission system has 40,000 relays, of which 900 relays may be Y2K sensitive. Of these 900 relays, 60 variations have been tested and found compliant or ready. Additionally, 7 families of relays have been tested. The energy management system (EMS), protective relays, PLCs in capacitor banks, and power line carriers are mission critical items. Hardware Y2K compliance appears to be acceptable, but some software applications are still under TVA review for Y2K readiness. TVA will complete Y2K readiness of its facilities by June 1999, except the EMS, which will be ready in midsummer 1999.

TVA is coordinating with NERC and SERC to ensure grid stability during the Y2K period. The TVA draft contingency plan will be submitted to NERC by December 31, 1998. These plans will be integrated into the NERC contingency plan. NERC will conduct its own drills to test telecommunications capabilities. The first drill involving TVA will be conducted in April, 1999. TVA will also conduct drills of its readiness during 1999.

2.2:10. Critical Suppliers

TVA has prepared a project plan for controlling critical supplies. TVA evaluated its dependency on business partners, customers, and infrastructure suppliers. These three groups were collectively identified as business partners. TVA is soliciting information from these business partners to assess their Y2K readiness. Each business partner was assigned to one of three classification groups: mission critical, high priority, or low priority.

Business partners classified as mission critical were further prioritized based on their potential to disrupt TVA operations either financially or in terms of customer service. The completed assessments are retained in records management for future reference.

Mission critical TVA business partners who are not addressing Y2K readiness will be included in a business impact analyses and contingency planning. These analyses will be provided to the Fuel Supply, Procurement, and Customer Group to aid in developing plans to mitigate risks to TVA. This information will also be provided to the TVA Office of General Counsel for use in resolving contract issues and to support litigation activities. Additionally, TVA is identifying alternate critical suppliers as part of its contingency planning.

3.0 AUDIT TEAM OBSERVATIONS

The audit team reviewed in detail 19 (see Table 3) of the 84 (see Table 2) mission critical and important to operations software applications. Of the 134 mission critical digital systems and digital components identified by the licensee (see Table 4), the audit team reviewed 31 (see Table 5). The licensee's documentation was sufficient for justifying the results of the assessments of Y2K compliance/non-compliance.

The following observations were made by the team auditing the TVAN Y2K readiness program, as it was applied at WBN:

1.   TVAN has a common Y2K project implementation plan for all its nuclear facilities The TVAN Y2K project plan establishes the scope and control of the Y2K Project Plan at the WBN plant. The Y2K Project Plan is comprehensive and incorporates the major elements of the nuclear power industry Y2K problem guidance contained in Nuclear Energy Institute (NEI)/Nuclear Utilities Software Management Group (NUSMG) 97-07, "Nuclear Utility Year 2000 Readiness."

2.   The TVAN Y2K program is receiving appropriate management support and oversight at the WBN plant. TVAN sponsorship for the Y2K program is aggressive.

3.   The licensee began the formal WBN Y2K readiness program in December 1997, and finished the plant inventory and initial assessment phase on March 5, 1998. The detailed assessment phase for systems and components that are mission critical or important to operations is scheduled to be completed by December 31, 1998. The licensee has established a tightly-controlled schedule for completing Y2K readiness of critical applications and systems by May 1, 1999, and all systems will be Y2K ready by June 1, 1999. The Y2K readiness schedule appears to be achievable because of the dedicated effort at this site, the fact that the licensee has already begun modification or replacement of major critical computer systems, and the licensee has received support via information sharing with EPRI, other licensees, the Southeast Electricity Reliability Council, and the North American Electric Reliability Council.

4. The licensee has started the WBN Y2K contingency planning. The licensee is using the nuclear industry guidance in NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning," for this effort and is in the process of integrating contingency planning in the TVAN Year 2000 Project Plan. The TVAN Contingency Plan is scheduled for completion on March 31, 1999.

5. The licensee is conducting confirmatory testing of mission critical system Y2K compliance at the plant site for those systems and applications not certified by vendors on the licensee's approved supplier's list.

6. The licensee's independent assessment of the TVAN Y2K project plan was in the planning stage at the time of this audit. Recommendations from that assessment will be addressed by the WBN Y2K project team for subsequent revisions of the TVAN Y2K project plan.

7. Materials management is being addressed by the licensee. The licensee recognizes that the Y2K checks and balances now in place should be proceduralized for future materiel control. Mission critical suppliers have been identified, and the licensee is taking proactive steps to ensure that acceptable inventories of critical supplies will be available.

8. In addition to tracking the Y2K readiness status of each application and system, the licensee also tracks the Y2K readiness status of the affected plant systems (e.g., Main Steam System, High Pressure Injection System, Reactor Protection System), and provides a cross reference to applicable application and system Y2K readiness packages. This provides the licensee with important plant system operability status information.

Table 1   TVAN Y2K Project Implementation Schedule
Table 2   WBN Software Applications Inventory
Table 3   WBN Software Applications Reviewed by the Audit Team
Table 4   WBN Digital Systems and Components Inventory
Table 5   Digital Systems and Components Reviewed by the Audit Team

Attachment 1 Watts Bar Y2K Audit Plan Outline
Attachment 2 Documents Reviewed
Attachment 3 Entrance Meeting - Attendees

Table 1 - TVAN Y2K Project Implementation Schedule

Activity	Starting Date	Finishing Date
Awareness and Initial Assessment	12/3/97	4/15/98
Detailed Assessment	5/1/98	2/24/99*
Y2K Certification	8/21/98	6/1/99

* Detailed assessment of mission critical and important to operations times to be completed by 12/31/98.

Table 2 -WBN Software Applications Inventory

System/Group	Priority			Total
	Mission Critical	Important to Operations	Desirable	
Computer Engineering Group	0	2	3	5
Corporate Information Services	0	1	1	2
Engineering Systems	0	9	3	12
Environmental Group	2	4	0	6
Measuring &Test Equipment	0	1	1	2
Maintenance Group	0	1	4	5
Operations	1	10	5	16
Rad/Chem	0	46	10	56
Scheduling	0	3	0	3
Security	0	4	1	5
Tool Room	0	0	3	3
Training/Simulator	0	0	39	39
Total	3	81	70	154

Table 3 - WBN Software Applications Reviewed by the Audit Team

Seq No.	Group	Application
WB-047	RadChem	Radman
WB-065	RadChem	VSDS Visual Survey Data System
WB-080	Ops	ININ (Incore Program)
WB-081	Ops	INCORE3D
WB-084	Ops	AXIMBAL
WB-088	Ops	BOARDCAL
WB-089	Ops	REACTINW
WB-090	Ops	REACTW
WB-096	Engg	HELIOS Version 1.1
WB-154	Training	System
WB-175	Engg	Radiation Monitoring System Radiation Monitoring Microprocessor Assembly
WB-176	Engg	Radiation Monitoring System Radiation Monitoring Microprocessor Assembly
WB-246	Security	CCTV & Security System C-CURE System 1 Plus
WB-249	Security	CCTV & Security System C-CURE System 1 Plus
WB-250	Security	CCTV & Security System Allegiant Main CPU Interface Software for the Burle Video Switcher TC8759
WB-267	RadChem	SKINISO
WB-268	RadChem	SKINNG
WB-432	Environ.	MET (EDS System)
WB-433	Environ.	WATCHDOG

Table 4 - WBN Digital Systems and Components Inventory

System/Group	Priority			Total
	Mission Critical	Important to Operations	Desirable	
Engineering Systems	122	141	109	372
Environmental Group	9	2	4	15
Operations	0	1	1	2
Rad/Chem	0	18	9	27
Telecommunications	3	1	1	5
Training/Simulator	0	29	1	30
Total	134	192	125	451

Table 5 - WBN Digital Systems and Components Reviewed by the Audit Team

Seq No.	Group	Application
WB-100	Engg	Neutron Monitoring System Shutdown Monitor
WB-103	Engg	Neutron Monitoring System Source Range Drawer
WB-105	Engg	Neutron Monitoring System Intermediate Range Drawer
WB-106	Engg	Neutron Monitoring System Optical Isolator
WB-109	Engg	Neutron Monitoring System Wide Range Drawer
WB-167	Engg	Radiation Monitoring System Radiation Monitoring Microprocessor Assembly
WB-171	Engg	Radiation Monitoring System Control & Indicating Assembly
WB-209	Engg	Turbine Bldg Cranes & Miscellaneous Systems and Containment & Auxiliary Bldg Cranes & Miscellaneous Systems Programmable Controller
WB-224	Engg	Main Feedwater/Aux Feedwater AECL Anticipated Transient without SCRAM Mitigating System Actuation Circuit
WB-225	Engg	Main Feedwater/Aux Feedwater AECL Anticipated Transient without SCRAM Mitigating System Actuation Circuit
WB-229	Security	CCTV & Security System BBWireStar Repeater
WB-230	Security	CCTV & Security System Local Intelligence Unit (LIU) board
WB-233	Security	CCTV & Security System BBQ boards
WB-245	Security	VAX Computer VMS V5 5-2H4
WB-284	Fire Ops	Fire Detection System Fire Detection Monitoring Panel
WB-406	Engg	CVCS Recorder
WB-407	Engg	CVCS Recorder
WB-410	Engg	RCS Plasma Display Keypad
WB-411	Engg	RCS ICCM Plasma Display
WB-424	Environ.	Onan 30 KW Motor/Generator
WB-430	Environ.	Wind Speed Direction Recorder
WB-439	Fire Ops	Table 5 - Embedded Systems Reviewed by the Audit Team Fire Detection System Fire Detection
WB-440	Engg	Radiation Monitoring System Radiation Monitoring Microprocessor Assembly
WB-457	Engg	RCS ICCM
WB-458	Engg	RPS EAGLE 21
WB-461	Engg	RPS EAGLE 21
WB-471	Fire Ops	Fire Detection System Fire Detection
WB-472	Fire Ops	Fire Detection System Fire Detection
WB-517	Security	CCTV & Security System Repeater
WB-518	Security	CCTV & Security System Repeater
WB-521	Security	CCTV & Security System Repeater

Watts Bar Y2K Audit Plan Outline

A. Project organization

B Project Manager -

C. Project Sponsor -

1. Participation in Owners Group, Group activities related to the Y2K effort, (EPRI, NEI). Peer review efforts.

2. Corporate activities

3. Schedule of activities for Y2K readiness

Activity	Starting Date	Finishing Date
Communication/ Awareness		
Project Plan		
Inventory		
Detailed analysis/testing		
Remediation		
Validation/testing		
Contingency Planning		

4. Inventory

    (Review the Information Database.)

    Classification:

5. Analysis -

    Number of items identified as Y2K compliant. Review how this was determined - Vendor data; any additional testing.

    Number of items not Y2K compliant -

    Accept As Is: (Review how this was determined. ___ require validation testing. Check vendor data, Owners Group data, any testing by vendor?)

a) Vendor evaluation - validation testing based on criticality of item, prior experience with vendor, extent of documentation, or plant knowledge of the item

b) Plant owned or supported software (including tools) evaluation - knowledge based decisions, scanning, testing. When testing proposed, need test specifications and procedures.

c) Interface evaluation - Part of corporate plan (?) Grid, substation, communication,

d) Embedded components evaluation - knowledge based decisions and testing. When sufficient vendor and plant information is available to support a knowledge-based decision, no additional testing is required. (Review the documents when this is the case.)

6. Remediation - Use of existing software procedures (?). Verify long term commitments for maintaining Y2K readiness.

7. Y2K Testing and Validation

-   Assessment testing - Per Computer problem/change reports (PARS) and associated V&V plans and test procedures.

-   Testing subsequent to remediation - unit testing; integration testing; system testing.

8. Regulatory Considerations - 10 CFR 50.59 reviews; reportability evaluations per 10 CFR 50.72, 50.73 and part 21; operability determinations.

9. Contingency Planning - NEI/NUSMG 98-07

Internal Risks
External Risks
Remediation Risks (Vendor support, resource limitations, etc.)

10. Y2K Management Plan-

Tracking against milestones of the project. Management awareness. Status reporting
External resources
Use of existing procedures for software QA, configuration management, V&V,
Documentation
Audits (any audits done/reports issued).

Documents Reviewed

1. TVAN Y2K Project Team (Roster of Participants)

2. "TVAN Year 2000 Project Plan," Rev. 2.2, October 30, 1998

3. WBN Y2K Organization

4. "Watts Bar Year 2000 Project Status," dated November 14, 1998

5. Device & Application Inventory

6. WBN Y2K Audit Entrance Meeting Slide Handouts

7. "TVA IDNX Backbone Network," Drawing dated August 10, 1998

ATTACHMENT 2

Entrance Meeting - Attendees

November 16, 1998

Bob Alsup	TVA Site Quality
Sheila Baker	Transmission and Power Systems
Ron Brow	TVAN Licensing
Vincent Burzese	Transmission and Power Systems
Jerry Bushnell	WBN Licensing
Johnfred Carlton	Transmission and Power Systems
Jack Cox	TVA
Mario Gareri	NRC
Frank Koontz	TVA Site Engineering
W. Lagergren	WBN Plant Manager
Barbara McKenna	TVAN Y2K Project Coordinator
Norman Merriweather	NRC
Dave Nelson	WBN Business & Work Performance Manager
David Nye	TVAN Y2K Project Manager
Duane Olcsvary	WBN Y2K Project Coordinator
Paul Pace	TVAN Licensing
Dan Rich	NRC/RI
John Roden	TVA Operations Training
Jim Staub	TVA Site Engineering
Frank Tanner	TVA Y2K Device Test Coordinator
Kim VanDoorn	NRC/SRI
Mike Waterman	NRC
J. West	WBN Assistant Plant Manager
Franklin Wheeler	TVA Telecommunications

ATTACHMENT 3