

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 Nos: 50-325, 50-324  
License No: DPR-71, DPR-62  
Licensee: Carolina Power & Light Company (CP&L)  
Facility: Brunswick Steam Electric Plant Units 1 & 2  
Location: Highway 87 N  
Southport, NC 28461  
Dates: October 6 - 9, 1998  
Audit Team Members: Matthew Chiramal, NRR  
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Approved by: Jared Wermiel, Chief  
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Office of Nuclear Reactor Regulation

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Enclosure

## EXECUTIVE SUMMARY

From October 6 through 9, 1998, the NRC staff conducted an audit of the Year 2000 (Y2K) readiness program at the Brunswick Steam Electric Plant, Units 1 & 2, (Brunswick) in accordance with the audit plan (Attachment 1) for this activity. The purpose of the audit was to (1) assess the effectiveness of the Carolina Power and Light Company (CP&L) (the licensee) programs 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 the 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 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 Brunswick 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 Brunswick Y2K readiness program, the following observations were made:

1. CP&L has a common Y2K project implementation plan which establishes the scope and control of the Nuclear Generation Group (NGG) Year 2000 Readiness Program at CP&L's three nuclear power stations (Brunswick, Robinson, and Shearon Harris) and two engineering divisions. The plant-specific NGG Year 2000 Readiness Program Project Implementation Plan for the Brunswick Nuclear Plant 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 Brunswick Y2K readiness program is receiving appropriate management support and oversight.
3. The licensee began the formal Brunswick Y2K readiness program in September 1997, developed the plant inventory by December 1997, completed the initial assessment phase in March 1998, and is scheduled to complete the detailed assessment phase in December 1998. The licensee has established a tightly-controlled schedule in order to meet the June 1999 Y2K readiness date established by the program. (The one exception in meeting the readiness schedule is the installation and integrated system testing of the modified, Y2K compliant digital feedwater control system application in Brunswick Unit 1. The licensee plans to take a forced outage on Unit 1 sometime in the Fall of 1999 to accomplish this activity.) 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 of major critical computer systems, and the licensee has received support via information sharing with the Boiling Water Reactor Owners Group, EPRI and CDSV, the utility alliance with Duke Energy, South Carolina Electric & Gas, and Virginia Power.

4. The licensee has started the Brunswick 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 next revision of the Brunswick Year 2000 Readiness Project Implementation Plan. With proper integration of this effort in the project implementation plan and schedule, the licensee should be able to complete this effort by July 1999 with the exception of some required testing.
5. The licensee is accepting vendor certifications for embedded components including those in high priority mission critical systems without conducting additional confirmatory testing at the plant site. This approach is based upon the licensee's reliance on and confidence in its established vendor qualification program and resulting approved vendor/supplier list. The audit team acknowledged that the decision on whether to perform additional embedded component 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 obtained.
6. The audit team identified an area of inconsistency in the implementation of Y2K susceptibility testing. In reviewing some of the testing that has been completed, the audit team found (in high priority applications) that different licensee business units use a variation of the test guidance.

The audit team concludes that the NGG Y2K testing effort would benefit from additional communication between business units or additional training to ensure consistent application of the test procedure guidelines. The licensee stated that aggressive actions to address this issue at the NGG level have been initiated.

## REPORT DETAILS

### 1.0 INTRODUCTION

The objectives of the Brunswick Units 1 and 2 plant-specific CP&L NGG Y2K Readiness Program audit were to:

1. Assess the effectiveness of the CP&L (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 the 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 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 CP&L Year 2000 Program Implementation Plan (Document Number 3 listed in Attachment 2).

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

Following the meeting, the audit team spent the rest of the audit reviewing the project plan and its associated procedures, the plan implementation products (documents and data bases) and interacting with the project manager and project team members. The documents reviewed are listed in Attachment 2.

## 2.0 BRUNSWICK Y2K PROJECT DESCRIPTION

### 2.1 Project Organization

The Brunswick Steam Electric Plant (BSEP) Site Coordinator for Y2K readiness is Gil Manacsa. Mr. Manacsa reports to Eric Northeim, who is the project manager (PM) for the CP&L NGG Year 2000 Readiness Project, of which BSEP is one of three CP&L plant sites that use the NGG project implementation plan. The BSEP Y2K readiness project site sponsor is Bo Lindgren. The BSEP Y2K readiness project has 12-15 full-time equivalent persons, divided among approximately 20 staff. The PM has overall responsibility for the project and reports to the Manager of the CP&L Nuclear IT Group, who reports in turn to Tom Walt (Project Sponsor), Department Manger for Operations and Environmental Support Department. Tom Walt reports to Scotty Hinnant, Chief Nuclear Officer, CP&L.

Brunswick participates with other organizations that are addressing the Y2K effort. The licensee has been involved with the BWR Owners Group, the alliance with Duke Power Company, South Carolina Electric & Gas, and Virginia Power (The CDSV Nuclear Exchange Program), and is a participant in the EPRI Embedded System Program.

### 2.2 Project Plan

The Brunswick plant-specific Year 2000 Project Implementation Plan (Item 5 of Documents Reviewed ) was developed by the licensee to establish the scope and control of the plant program consistent with a common plan (Item 3 of Documents Reviewed) which is applied uniformly at the three CP&L nuclear power plant sites, and in the two CP&L corporate engineering divisions. The audit team reviewed Rev. 3 of the CP&L NGG common plan, dated September 4, 1998. Revision 4 of this plan is to be issued in October, 1998. The CP&L NGG Project Implementation Plan is based on the guidance provided in NEI/NUSMG 97-07, which was endorsed by the NRC in NRC Generic Letter 98-01 as guidance which presents one approach for achieving Y2K readiness. The audit team's review confirmed that the NGG Year 2000 Project Implementation Plan is based on the guidance contained in NEI/NUSMG 97-07.

The NGG Year 2000 Project Implementation Plan consists of the following phases: the Study Phase, which comprises the elements of Awareness and Initial Assessment; the Implementation Phase, which contains the elements of Detailed Assessment, Testing, Remediation, and Validation; and the Contingency Planning Phase. The project implementation plan also includes requirements for quality assurance, regulatory considerations, and documentation.

### 2.2.1 Awareness

At Brunswick, the formal Y2K Study Phase of the Y2K program was initiated in August 1997. Part of this program phase included the Project Communications Plan, Rev. 0, which was completed on December 9, 1997. The Communications Plan describes the actions necessary to inform NGG management and employees, and interface with the CP&L corporate Y2K compliance effort and external organizations. The Communication Plan prescribes actions for briefing NGG management, educating the general population of NGG personnel via departmental newsletters, training personnel who are to perform inventory and assessment activities, coordinating Y2K team communications, and reporting of team progress to NGG management.

The audit team reviewed samples of communiques issued from November 1997 to early 1998. Based on the samples reviewed the audit team considers that CP&L has an effective Y2K awareness program.

The Brunswick Y2K project implementation schedule is provided in Table 1.

### 2.2.2 Initial Assessment

The initial assessment part of the Study Phase of the Brunswick Year 2000 Project started in August 1997 and was completed by March 1998. The completed initial assessment resulted in the identification of an inventory of the software applications and embedded system components at the Brunswick. The tasks of initial assessment included: (1) inventory, (2) categorization, (3) classification, (4) prioritization and, (5) analysis of the initial assessment.

The inventory of potentially impacted applications, computer systems and hardware, and embedded plant systems/components was developed by plant personnel familiar with and responsible for each business unit area using the Year 2000 project scope assessment data sheet which is part of the Project Implementation Plan. For software applications, the licensee used the inventory developed for the plant software quality assurance manual as means for gaining additional confidence in the completed inventory.

In the identification of embedded systems, the licensee reviewed the procedures and documentation for occurrences of phrases that would indicate 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 Brunswick initial assessment of the software applications and embedded items are placed in the Brunswick Y2K Application Checklist and Embedded Component Summary.

The total inventory of potentially affected systems at the Brunswick Nuclear Plant is 736 - 252 software applications and 484 embedded systems/components. Table 2 provides the results of the inventory of software items and Table 4 lists the embedded systems/components. Of the total of identified embedded items, 190 items were assigned

High priority, and 64 of these High priority items have been certified to be Y2K compliant. Table 5 lists those embedded systems that were reviewed by the audit team.

### Prioritization

The inventory includes a prioritization of the identified items. The priority is based on the criticality and risk of the functions performed. The licensee used risk assessment methods to prioritize each inventoried item as high, medium, low, or replaced/obsolete. High priority items are those items whose failure could affect nuclear or personnel safety, adherence to regulatory requirements, or loss of plant capacity. Medium priority items are those items whose failure could significantly impair the ability of the licensee to execute major business functions, cause unavailability of Maintenance Rule systems, or could create operator workarounds. Low priority items are those items whose failure could cause inconvenience but would not impair the licensee's ability to perform major business or system functions. Replaced or obsolete items are those items that will be replaced or become obsolete before Y2K problems are encountered. The licensee's prioritization process encompasses the criteria described in NEI/NUSMG 97-07.

Tables 2 and 4 list the prioritization of the inventoried software applications and embedded systems, respectively. Of the 26 High priority software items identified, 4 items have been certified Y2K compliant, and 22 items require assessment testing. Table 3 provides a list of high priority software applications at the Brunswick Nuclear Plant.

### Analysis of Initial Assessment

The results of the Brunswick initial assessment of the software applications and embedded component items are in the Brunswick Y2K Application Checklist and Embedded Component Summary. The licensee completed the initial assessment phase in March, 1998. Analysis of the initial assessment is the final step in the Study Phase. 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. Items with a Replaced/Obsolete designation were not assessed and no remediation actions will be taken.

### NRC Audit Team Assessment

The audit team reviewed in detail 6 of the 26 high priority software applications initial assessment packages identified in Table 3, and 34 of the 484 embedded components identified by the licensee, as identified in Table 5. The reviewed embedded components were designated high priority and were selected from a database print-out provided to the audit team by the licensee. The audit team also reviewed some assessment data of a few items in the medium and low priority categories. Based on its review, the audit team found the initial assessment phase to be appropriate and implemented consistent with the guidelines in NEI/NUSMG 97-07.

### 2.2.3. Detailed Assessment

In the Brunswick Year 2000 Readiness Program Implementation Plan, the Implementation Phase contains the elements of Detailed Assessment, Testing, Remediation, and Validation.

Detailed assessment is performed for all high and medium priority items consisting of vendor evaluation, interface evaluation, spare parts evaluation, training system evaluation, test plans/results, subject matter experts review, and results. Vendor evaluation encompasses evaluation of available manufacturer/developer information (such as contracts, correspondence, vendor manuals, internet listings, and vendor owners groups), communication with vendors using the corporate vendor management program standard vendor questionnaire, and direct communication with vendors. Interface evaluation includes both internal and external system interfaces for passing date and time related data. Test plans/results involves the development of test procedures and acceptance criteria to determine if a Y2K date problem exists. Using the CP&L Corporate Testing Guideline. If no testing is performed, justification should be provided as to why it was not required. Spare parts evaluation involves the review of items to ensure that Y2K problems are not recurrent after remediation efforts are completed. Training systems evaluations address training systems that duplicate plant systems, such as the plant simulator. The assessment considers the impact of Y2K problems on simulator existing equipment and upgrades. Subject matter expert review addresses the use of any other relevant information obtained through walkdowns, review of embedded chips, and review of source code. Results of the assessments provide remediation recommendations and justifications.

The licensee is scheduled to complete its detailed assessment in December, 1998. To date, detailed assessment has been completed on 308 of 736 total items. Based on the audit team's review of completed items, the audit team found that the detailed assessments performed to date follow the project implementation plan.

### 2.2.4. Y2K Testing and Validation

As part of the Implementation Phase of the project implementation plan, test procedures are to be developed for High and Medium priority items to determine if a Y2K problem exists using the testing criteria of the program implementation plan. If no test is to be performed justification is to be provided as to why it was not required.

The licensee is accepting vendor certifications for embedded components including those in high priority mission critical systems without conducting additional confirmatory testing at the plant site. This approach is based upon the licensee's reliance on and confidence in its established vendor qualification program and resulting approved vendor/supplier list. Responsibility for ensuring proper implementation of the vendor qualification program lies with the Brunswick Quality Assurance Department. The audit team acknowledged that the decision on whether to perform additional embedded component susceptibility testing is based on the licensee's determination of importance of the affected system and knowledge of the item, prior experience with the vendor, and other relevant information obtained.



The audit team identified an area of inconsistency in the implementation of Y2K susceptibility testing. In reviewing some of the testing that has been completed, the audit team found (in high priority applications) that different licensee business units use a variation of the test guidance as follows:

- The 9/9/99 date test is not always performed. In some of the test cases, the test is done by starting from 9/9/99 and rolling the date over to 9/10/99, and in some of the cases, the test is started on 9/8/99 and rolled over to 9/9/99.
- The 12/31/99 rollover to 1/1/2000 and continuance into the year 2000 is done in different ways.
- The Leap Year test is done differently, with 2/28/2000 rolled over to 2/29/2000. In some cases the test verifies 2/29/2000 rollover to 3/1/2000, and in other tests this is not verified.
- In some cases the Leap Year tests an incorrect rollover from 12/30/2000 to 1/1/2001 (failure to recognize a 366-day year), and in other cases this is not tested.

The audit team concludes that the NGG Y2K testing effort would benefit from additional communication between the business units or additional training to ensure consistent application of the test procedure guidelines. The licensee agreed to promptly address this issue throughout the NGG organization.

#### 2.2.5. Remediation

Remediation is the process of retiring, replacing or modifying of 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 these modifications and upgrades using existing plant procedures for digital systems. The final documentation of the detailed assessment and remediation is the Year 2000 Certification Package.

#### 2.2.6. Regulatory Considerations

The Brunswick Year 2000 Project Implementation Plan and associated documents (items 1, 2, 3, 4, and 5 of documents reviewed) include references to existing plant procedures that have guidance on regulatory considerations, such as 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

Brunswick 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 is scheduled for completion in October, 1998, when it will be integrated with the Brunswick Year 2000 Project Implementation Plan, Revision 4. The audit team was briefed on the contingency planning aspects in the draft version of the forthcoming Revision 4. Based upon the briefing and a review of the draft plan, the audit team considers that the proposed contingency planning activities are consistent with the guidance of NEI/NUSMG 98-07. If at the completion of the detailed assessment phase the integrated plan is implemented with the same rigor as presently applied, the audit team believes that the July 1999 schedule for completion of the project contingency plans can be achieved, with the exception that some of the training needs may extend into the third and fourth quarters of 1999.

#### 2.2.8. Y2K Program Management

The Brunswick Y2K readiness program schedule is aggressively tracked on a continuous basis by corporate and site management. The Y2K program progress is summarized in a lightboard format that defines the progress of each Y2K system being evaluated. Additionally, the licensee graphically summarizes the status of each phase for corporate management review. From discussions with licensee personnel, schedule slippages have resulted in counseling and immediate corporate management attention. At present, there are no schedule slippages in the Y2K program at Brunswick.

#### 2.2.9. Electric Grid Issues

The audit team discussed electric grid issues with the licensee. The licensee stated that the Southeastern US region has initiated activities to address grid reliability with respect to the Y2K problem. Within this region, there are four subregions, one of which is VaCar, consisting of power suppliers Virginia Power, Duke Energy, CP&L, and Southern Carolina Gas & Electric. CP&L as part of VaCar, has initiated Y2K problem assessments of the various business units affecting the grid including Generation, Transmission & Distribution, and Power Management Systems.

The CP&L corporate Y2K program includes contingency planning which interfaces with the Brunswick Y2K program contingency plan. The licensee is addressing internal and external risks that can affect the grid availability. The contingency plans are intended to be consistent between utilities in the region to ensure one utility will not adversely impact others. The contingency plans will consider probable and credible worst-case scenarios for external as well as internal events. To ensure sufficient electrical energy resources are available, the region utilities are using last New Years Eve electrical demand to estimate the energy demand required for New Years eve, 1999. The licensee estimates that the grid load will be at 60% capacity and is committed to have reserves on line to handle additional supplier demands. Black-start capabilities and capacities are also being addressed.

The licensee plans to test the software at the Power Management Systems' energy control center on the energy control center simulator. The simulator will be run to simulate potential Y2K events. External risks will also be considered via impact studies. Such risks include critical item suppliers, sabotage potential, telecommunications, satellite

synchronization, and global positioning system failures. The audit team determined that licensee Y2K program efforts to address grid reliability are appropriate.

### 3.0 AUDIT TEAM OBSERVATIONS

The following observations were made by the team auditing the Brunswick Y2K readiness program:

1. CP&L has a common Y2K project implementation plan which establishes the scope and controls of the NGG Year 2000 Readiness Program at CP&L's three nuclear power stations (Brunswick, Robinson, and Shearon Harris) and two engineering divisions. The plant-specific NGG Year 2000 Readiness Program Project Implementation Plan for the Brunswick Nuclear Plant 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 Brunswick Y2K readiness program is receiving appropriate management support and oversight.
3. The licensee began the formal Brunswick Y2K readiness program in September 1997, developed the plant inventory by December 1997, and completed the initial assessment phase in March 1998, and is scheduled to complete the detailed assessment phase in December 1998. The licensee has established a tightly-controlled schedule in order to meet the June 1999 Y2K readiness date established by the program. (The one exception in meeting the readiness schedule is the installation and integrated system testing of the modified, Y2K compliant digital feedwater control system application in Brunswick Unit 1. The licensee plans to take a forced outage on Unit 1 sometime in the Fall of 1999 to accomplish this activity.) 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 of major critical computer systems, and the licensee has received support via information sharing with the Boiling Water Reactor Owners Group EPRI and CDSV, the utility alliance with Duke Energy, South Carolina Electric & Gas, and Virginia Power.
4. The licensee has started the Brunswick 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 next revision of the Brunswick Year 2000 Readiness Project Implementation Plan. With proper integration of this effort in the project implementation plan and schedule, the licensee should be able to complete this effort by July 1999, with the exception of some required training.
5. The licensee is accepting vendor certifications for embedded components including those in high priority mission critical systems without conducting additional confirmatory testing at the plant site. This approach is based upon the licensee's reliance on and confidence in its established vendor qualification program and

resulting approved vendor/supplier list. The audit team acknowledged that the decision on whether to perform additional embedded component Y2K 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 obtained.

6. The audit team identified an area of inconsistency in the implementation of Y2K susceptibility testing. In reviewing some of the testing that has been completed, the audit team found (in high priority applications) that different licensee business units use a variation of the test guidance. The audit team concludes that the NGG Y2K testing effort would benefit from additional communication between business units or additional training to ensure consistent application of the test procedure guidelines. The licensee stated that aggressive actions to address this issue at the NGG level has been initiated.

Table 1	Brunswick Y2K Project Implementation Schedule
Table 2	Software Inventory
Table 3	Inventory of High Priority Software at Brunswick
Table 4	Inventory of Embedded Systems
Table 5	Embedded Components Reviewed by the Audit Team

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

Table 1 - Brunswick Y2K Project Implementation Schedule

<u>Activity</u>	<u>Starting Date</u>	<u>Finishing Date</u>
Awareness	1994*, August 1997	September 1998 (continuing)**
Initial Assessment	December 1997	March 1998
Detailed assessment	June 1998	December 1998
Testing/Validation	June 1998	June 1999
Remediation	June 1998	June 1999
Contingency	September 1998	July 1999

\* A limited awareness effort began with the receipt and review of NRC Information Notice 96-70 in December 1996.

\*\* The Brunswick personnel are kept informed of the Y2K readiness project status through the Site News Letters.

Table 2 - Software Inventory

BSEP Business Unit	Priority				Total
	High	Medium	Low	R/O	
Chemistry		4	26	2	32
Document Services		1	12	6	19
Engineering	3	11	12	5	31
Emergency Planning	2	2			4
Health Physics		29	20	1	50
Maintenance	2	8	6	1	17
Nuclear Assessment			5		5
Nuclear Information Technology	1	1	18	8	28
Outage and Scheduling	3	9	12	2	26
Process Computing	11	6	10	1	28
Regulatory Affairs				1	1
Security			4		4
Training	4			3	7
Total	26	71	125	30	252

Table 3 - Inventory of High Priority Software at Brunswick.

Software Applications		
File Number	Name	Complete
A0578	Pod	Y*
A0579	Pod_apps	Y*
A0764	SPDS	Y*
A0887	Work Control	Y*
A0057	Battery Capacitance Test Set	*
A0067	BNP Simulator	
A0068	BNP Simulator CMS (new)	
A0130	Core Flow Calculations	
A0135	CPL DOSE - Initial Dose Projection	
A0172	DIALOGIC (BEN)	
A0231	EQDB	
A0234	ERDS	
A0236	ERFIS	
A0309	HEATBALA Heat Balance Calculations, PT 1.8D	
A0310	HEATBALF Heat Balance Calculations, PT-1.8D	
A0358	IRIX Operating System for Simulator Computer	
A0473	NE - Nuclear Engineering core monitoring program	
A0509	Off Gas 6.2.1 (OG61)	
A0570	Plant Monitoring System (AFORA PMS)	
A0572	Plant Process Computer(PPC)	
A0701	RODTIM	
A0771	SPTMS	
A0810	TIP Traces, ETIP	
A0818	TRA	
A0857	VOTES (BNP)	*
A0903	DFW-Simulator	

\* Reviewed by NRCaudit team during audit.

Table 4 - Inventory of Embedded Systems

Business Unit	Priority				Total
	High	Medium	Low	R/O	
Engineering	146	105	164	3	418
Process Computing	44	2	13	7	66
Total	190	107	177	10	484

Table 5 - Embedded Components Reviewed by the Audit Team

Embedded Systems		
File Number	Name	Completed
BNP0084	X-Ray Search	Y*
BNP0085	X-Ray Search	Y*
BNP0086	X-Ray Search	Y*
BNP0104	C95-P603D. Shift Foreman Display Mon/processor	Y*
BNP0110	C95-P601C. TSC RM143 Color Display Mon/processor	Y*
BNP0111	C95-P602C. TSC RM123 Color Display Mon/processor	Y*
BNP0111	C95-P602C. TSC RM123 Color Display Mon/processor	Y*
BNP0112	C95-P603B. STA Desk Color Display Mon/processor	Y*
BNP0113	C95-P603D. Shift Foreman Display Mon/processor	Y*
BNP0121	C95-V3CR11. SPDS RTGB Workstation.	Y*
BNP0121	SPDS Workstations	Y*
BNP0121	C95-V3TS02. TSC RM143A SPDS Workstation.	Y*
BNP0121	C95-V3CR12. SPDS Control Operators Workstation	Y*
BNP0122	C95-V7EF04. TSC RM123 SPDS Workstation.	Y*
BNP0122	C95-V7TS03. TSC RM150 SPDS Workstation.	Y*
BNP0211	Flow Controller	Y*
BNP0211	Flow Controller	Y*
BNP0211	Flow Controller	Y*
BNP0211	Flow Controller	Y*
BNP0217	VA-FR-3359. Main Stack Flow Recorder	Y*
BNP0220	D12-RR-R601. Off Gas System Radiation Recorder	Y*
BNP0220	D12-RR-R601. Off Gas System Radiation Recorder	Y*
BNP0221	CAC-AR-1260. CONT ATM RAD, H2 & O2 Recorder	Y*
BNP0221	CAC-AR-1260. CONT ATM RAD, H2 & O2 Recorder	Y*
BNP0221	CAC-AR-1262. CONT ATM RAD, H2 & O2 Recorder	Y*
BNP0221	CAC-AR-1264. RX BLDG Roof Vent Radiation Recorder	Y*
BNP0221	CAC-AR-1262. CONT ATM RAD, H2 & O2 Recorder	Y*
BNP0225	SRV Leak Detectors	Y*
BNP0225	SRV Leak Detectors	Y*



Table 5--continued

Embedded Systems		
File Number	Name	Completed
BNP0255	Suppression Pool Temperature Monitoring System	Y*
BNP0257	SPDS RTGB Workstation	Y*
BNP0257	SPDS Control Operators Workstation	Y*
BNP0258	C95-V7CN11. SPDS Master Station	Y*
BNP0258	C95-V7CN21. SPDS Master Station	Y*

Brunswick Y2K Audit Plan Outline

A. Project organization

B. Project Manager -

C. Project Sponsor -

1. Participation in BWR Owners Group, CDSV group activities related to the Y2K effort, (EPRI, NEI). Peer review efforts thru CDSV group. EPRI participation for embedded systems.

2. Corporate activities

3. Schedule of activities for Y2K readiness

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

Eliminate

Fix

Replace

- 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 (PCRs) 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, GAO/AIMD -10.1.19
- 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. NGG Year 2000 Readiness Project Team (Roster of participants)
2. Carolina Power & Light Company Year 2000 Compliance Program Organization Chart, dated August 18, 1998
3. "Project Implementation Plan, NGG Year 2000 Readiness Program," Rev. 3, dated September 4, 1998
4. CP&L Phased Project Authorization Distribution, "BNP Year 2000 Readiness," dated June 15, 1998.
5. Implementation Phase Project Authorization, "BNP Year 2000 Readiness Project," dated May 15, 1998.
6. NEI/NUSMG 97-07, "Nuclear Utility Year 2000 Readiness," dated October 1997.
7. NEI/NUSMG 98-07, "Nuclear Utility Year 2000 Readiness Contingency Planning," dated August 1998.
8. NRC Generic Letter No. 98-01, "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," dated May 11, 1998.
9. Letter from CP&L to US NRC, "Response to Generic Letter 98-01, 'Year 2000 Readiness of Computer Systems at Nuclear Power Plants,'" dated August 7, 1998.
10. "Year 2000 Business Unit Action Plan Summary - BNP SW," dated September 23, 1998
11. "Year 2000 Business Unit Action Plan Summary - BNP Plant Systems," dated September 24, 1998
12. Brunswick Nuclear Plant NGG Year 2000 Program Implementation Status," (lightboards for Applications and Plant Components), dated October 2, 1998
13. Brunswick Nuclear Plant NGG Year 2000 Program Milestone Schedule," (for Applications and Plant Components), dated October 2, 1998
14. "Y2K Project Schedule Exception Report," memorandum from J. Colburn, CP&L, to T. D. Walt, CP&L, dated October 1, 1998.
15. "Project Review and Authorization Standard Procedure," Vol. 99, Book/Part 99, Rev. 1, ADM-NGGC-0102, dated August 22, 1997.
16. "Project Management Standard Procedure," Vol. 99, Book/Part 99, Rev. 3, ADM-NGGC-0103, dated May 7, 1998.

17. "Corrective Action Management Standard Procedure," Vol. 99, Book/Part 99, Rev. 1, CAP-NGGC-0001, dated July 8, 1998.
18. "Computer Configuration Control Standard Procedure," Vol. 99, Book/Part 99, Rev. 0, CSP-NGGC-2505, dated August 21, 1998.
19. "Computer Software Change/Activity Request Standard Procedure," Vol. 99, Book/Part 99, Rev. 0, CSP-NGGC-2506, dated August 21, 1998.
20. "Computer Software Documentation and Testing Standard Procedure," Vol. 99, Book/Part 99, Rev. 0, CSP-NGGC-2507, dated August 21, 1998.
21. "Quality Assurance Program Manual," Rev. 1, NGGM-PM-0007, dated July 10, 1998
22. "Engineering Service Requests Standard Procedure," Vol. 99, Book/Part 99, Rev. 9, CSP-NGGC-2505, dated July 13, 1998
23. "Project Implementation Plan, NGG Year 2000 Readiness Program," Rev. 4 (Draft).
24. Trip Report from M. Pugh to NGG Corporate Management, "Region II Y2K Contingency Planning Workshop on September 9-10, 1998," no date.
25. Summary of Y2K Vendor Management Program accomplishments. dated September 30, 1998.
26. Phase I pie graph of responses from vendors regarding product Y2K compliance.
27. Phase II Supplier list of vendors with Y2K compliancy dates for letters mailed to vendors and responses received from vendors.
28. Sample letters to vendors and from vendor regarding Y2K compliancy of products
29. Samples of Awareness presentations and newsletter
30. Year 2000 Compliance Packages (see File No.s corresponding to asterisks in "Complete" column in Tables 3 and 5).

Entrance Meeting - Attendees

October 6, 1998

J. S. Keenan  
E. Hux  
K. R. Jury  
G. Long  
J. P. Gawron  
G. D. Miller  
R. DeLong  
K. Nicely  
P. Leich  
K. Karp  
E. Northeim  
G. Manacsa  
N. Segars  
B. Lindgren  
G. Johnson  
H. Willetts  
J. Corcetti  
C. Schnell  
E. Campbell  
E. Brown  
G. Guthrie  
M. Chiramal  
M. Waterman  
C. Smith

VP, Brunswick NP  
Director of Site Operations  
Manager, Regulatory Affairs  
Operations Project Analyst  
Nuclear Assessment Section Manager  
BNP Engineering Support Services Manager  
Elec/I&C ESS Supervisor  
Senior Engineer, Regulatory Affairs  
NIT Supervisor  
    BESS Project Engineer  
NGG Y2K Project Manager  
NIT Y2K Site Coordinator  
NIT Y2K Admin Asst  
Site Support Section Manager  
PES Principal Engineer  
BESS Elec/I&C Supervisor  
Security Sr Business Analyst  
Operations Project Analyst  
ComEd Y2K Project Manager  
NRC BNP Resident Inspector  
NRC BNP Resident Inspector  
NRR  
NRR  
DRS, Region II