# BRUNSWICK NUCLEAR PLANT

# THREE YEAR BUSINESS PLAN

# PERFORMANCE IMPROVEMENT INITIATIVES & PROJECTS

Update IV

# BRUNSWICK NUCLEAR PLANT THREE YEAR BUSINESS PLAN

# PERFORMANCE IMPROVEMENT INITIATIVES & PROJECTS

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# INITIATIVES

# EXECUTIVE SUMMARY

## INTRODUCTION

Brunswick Nuclear Plant (BNP) has made improvements in the areas of planning, scheduling, and commitment achievement; human performance; work processes; communications; and system reliability and material condition. These improvements directly contributed to upgrades in the material condition of the plant, significant backlog reductions for Unit 1 and Unit 2, as well as the smooth and successful startup and operation of both units.

Changes to the BNP Three-Year Business Plan resulting from three management reviews during 1993 were incorporated into the plan to ensure long-term and sustained improvements in BNP performance. Plan changes were carefully evaluated based on balanced consideration of plant safety, reliability, and economics. Changes, additions, and cancellations were approved by the Vice-President BNP in accordance with the guidelines established under Initiative TY102, BNP Integrated Scheduling and Three-Year Plan Administration.

## PLAN ACCOMPLISHMENTS

Significant improvements were realized in all BNP Three-Year Business Plan focus areas. Planning, scheduling, and commitment achievement accomplishments include the implementation of an improved work control process, improved corrective maintenance backlog management, and implementation of the BNP Three-Year Business Plan. BNP human performance accomplishments include the establishment of a capable management team, implementation of a management succession plan, implementation of a supervisor and manager development program, development of an effective performance management (EPM) program, and significant facility improvements. BNP work processes underwent significant improvements in the areas of self assessment, backlog management, regulatory commitment management, and corrective action. The development of a centralized document control program and improved clearance process are also examples of improved BNP work processes. Effective communication is being realized at BNP through the establishment of an experienced site communications manager and the creation of multiple communication forums and platforms. System reliability and material condition realized significant improvements by establishing a basis for preventive maintenance tasks, implementing a reliability centered maintenance pilot program, installing corrosion resistant materials, upgrading ISI/IST programs, and implementing aggressive dose reduction activities.

## CURRENT STATUS

Twenty (20) of the forty (40) initiatives identified in the original BNP Three-Year Plan are ongoing. Seven (7) initiatives were task complete in 1993. Thirteen (13) initiatives have been superseded and deleted by other projects and work processes which are achieving the desired improvements. A detailed Initiatives Task Summary is included for reference.

## FUTURE FOCUS

The BNP Three-Year Business Plan will be managed to ensure trends of continuous improvement are maintained. BNP management is committed to ongoing plan implementation that is results based, focuses on improving work processes and performance, and safely supports plant priorities. Routine self assessments will be performed on initiatives to ensure effectiveness is maintained and that performance improvement objectives are met.

## INITIATIVES TASK SUMMARY

| INITIATIVE | TITLE | STATUS |
|---|---|---|
| TY101 | Integrated Planning & Scheduling | Initiative was task complete in 1993. Closure documentation has been provided. |
| TY102 | BNP Integrated Scheduling and Three-Year Plan Administration | Initiative was task complete in 1993 Closure documentation has been provided. |
| TY103 | Corrective Maintenance Backlog Reduction | The original Three-Year Plan identified twenty-three (23) tasks for this initiative. Ten (10) tasks remain ongoing. |
| TY104 | Business Planning Improvements | Initiative was task complete in 1993. Closure documentation has been provided. |
| TY105 | Inventory Control | The original Three-Year Plan identified seventeen tasks for this initiative. Seven (7) tasks remain ongoing. |
| TY106 | Outage Length Reduction | Initiative cancelled per August, 1993 update to Three-Year Plan. Works scope is being performed under Strategic Issue, Outage Management. |
| TY201 | Effective Performance Mgmt/Total Quality | The original Three-Year Plan identified sixteen (16) tasks for this initiative. Five (5) tasks remain ongoing. |
| TY202 | Training Improvements | The original Three-Year Plan identified thirty-six (36) tasks for this initiative. Nine (9) tasks remain ongoing. |
| TY203 | Utilization/Inter-Unit Support | Initiative is task complete. Closure documentation has been provided. |
| TY204 | Management Effectiveness | The original Three-Year Plan identified eleven (11) tasks for this initiative. Four (4) tasks remain ongoing. |
| TY205 | Supervisory & Management Development | The original Three-Year Plan identified thirteen (13) tasks for this initiative. Two (2) tasks remain ongoing. |
| TY206 | Brunswick Facility Improvements | The original Three-Year Plan identified thirteen (13) tasks for this initiative. Three (3) tasks remain ongoing. |
| TY207 | Nuclear Revision Control System | This initiative is in process of being cancelled because scope is currently covered within the action plan developed by Nuclear Business Operations (NBO) in their response to NAD Assessment C-SP-93-03. |
| TY208 | Integrated Computer Support | Initiative cancelled per August, 1993 update to Three-Year Plan. This scope of work is included in an NGG initiative to reorganize and establish computer and telecommunications organizational consistency among the three nuclear sites. |

| INITIATIVE | TITLE | STATUS |
|---|---|---|
| TY301 | Improved Procedure Control and Content | The original Three-Year Plan identified thirteen (13) tasks for this initiative. One (1) task remains ongoing. |
| TY302 | Improving the Modification Process | The original Three-Year Plan identified twelve (12) tasks for this initiative. Two (2) tasks remain outstanding. |
| TY303 | Improved Ability to Identify and Correct Problems | The original Three-Year Plan identified twenty-eight (28) tasks for this initiative. Three (3) tasks remain ongoing. |
| TY304 | Backlog Reduction | Initiative is task complete. Task closure documentation is in process. Backlog priorities and targets have been established and will be tracked via in-house management and tracking processes. |
| TY305 | Clearance Process Improvements | The original Three-Year Plan identified seven (7) tasks for this initiative. Two (2) tasks remain ongoing. |
| TY306 | Health Physics Program Improvements | Initiative cancelled per August, 1993 update to Three-Year Plan. The initiative tasks were identified under other initiatives, programs, or existing in-house processes. |
| TY307 | Implement/Augment BNP Local Area Network | Initiative cancelled per August, 1993 update to Three-Year Plan. Work scope is being performed in coordination with the corporate plan for installing company-wide LANs. |
| TY308 | Centralized Document Control Program | The original Three-Year Plan identified eight (8) tasks for this initiative. Thr[illegible]3) tasks remain ongoing. |
| TY309 | Improve Management of Regulatory Commitments | Initiative is task complete. Closure documentation is in process. |
| TY310 | Assess Implementation of SAT Items | Initiative cancelled per August, 1993 update to Three-Year Plan. Staff Assistance Team (SAT) improvements are incorporated in BNP self-assessment, strategic planning, and business planning processes. |
| TY401 | Site Communication Plan | Initiative is task complete. Closure documentation has been provided. |
| TY501 | Preventive/Predictive Maintenance Program Improvements | The original Three-Year Plan identified twenty-six (26) tasks for this initiative. Fifteen (15) tasks remain ongoing. |
| TY502 | Corrosion Preventive Maintenance | The original Three-Year Plan identified twenty-two (22) tasks for this initiative. One (1) task remains ongoing. |
| TY503 | Design Basis Reconstitution Program | Initiative cancelled per August, 1993 update to Three-Year Plan. Work scopes identified under projects B0018A, B0019A, BNT622, G0017A, and 05644A. |

| INITIATIVE | TITLE | STATUS |
|---|---|---|
| TY504 | Equipment Data Base System (EDBS) | Initiative cancelled per August, 1993 update to Three-Year Plan. Work scope is identified under project F0025C. |
| TY505 | Cooling Water Reliability Program | The original Three-Year Plan identified twenty (20) tasks for this initiative. Seven tasks remain ongoing. |
| TY506 | Plant Engineering Program Upgrade | The original Three-Year Plan identified twelve (12) tasks for this initiative. Three (3) tasks remain outstanding. |
| TY507 | Inservice Inspection and Inservice Testing Improvement Program | The original Three-Year Plan identified twenty-two (22) tasks for this initiative. Four (4) tasks remain ongoing. |
| TY508 | AC Source Improvement Project | Initiative cancelled per August, 1993 update to Three-Year Plan. Work scope is identified under project G0110A. |
| TY509 | Management of Temporary and Substandard Conditions | Initiative cancelled per August, 1993 update to Three-Year Plan. Work scope is being addressed through the implementation of a Temporary Modification Identification and Control Program, internal resources, and existing programs. |
| TY510 | Painting to Upgrade Material Condition | The original Three-Year Plan identified sixteen (16) tasks for this initiative. One (1) task remains ongoing. |
| TY511 | Dose Reduction/ALARA Initiatives | The original Three-Year Plan identified twenty-three (23) tasks for this initiative. Two (2) tasks remain ongoing. |
| TY512 | Environmental and Chemistry Program Improvements | The one (1) task on this initiative is scheduled to start and complete in 1994. |
| TY513 | Megawatt Improvement Projects | Initiative cancelled per August, 1993 update to Three-Year Plan. Work scope is being performed through internal resources and processes. |
| TY514 | Improve Plant HVAC Systems | Initiative cancelled per August, 1993 update to Three-Year Plan. Work scope is being performed through internal resources and processes. |
| TY515 | Fire Protection Upgrade Project | Initiative cancelled per August, 1993 update to Three-Year Plan. Work scope is being performed through internal resources and processes. |

## INITIATIVES TASK SUMMARY

| INITIATIVE | TITLE | STATUS |
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| TY101 | Integrated Planning & Scheduling | Initiative was task complete in 1993. Closure documentation has been provided. |
| TY102 | BNP Integrated Scheduling and Three-Year Plan Administration | Initiative was task complete in 1993. Closure documentation has been provided. |
| TY103 | Corrective Maintenance Backlog Reduction | The original Three-Year Plan identified twenty-three (23) tasks for this initiative. Ten (10) tasks remain ongoing. |
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| TY105 | Inventory Control | The original Three-Year Plan identified seventeen tasks for this initiative. Seven (7) tasks remain ongoing. |
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| TY505 | Cooling Water Reliability Program | The original Three-Year Plan identified twenty (20) tasks for this initiative. Seven tasks remain ongoing. |
| TY506 | Plant Engineering Program Upgrade | The original Three-Year Plan identified twelve (12) tasks for this initiative. Three (3) tasks remain outstanding. |
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| TY514 | Improve Plant HVAC Systems | Initiative cancelled per August, 1993 update to Three-Year Plan. Work scope is being performed through internal resources and processes. |
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## WORK PLANNING, SCHEDULING, AND COMMITMENT ACHIEVEMENT

Management control was evident in the areas of work planning, scheduling, and commitment achievement throughout 1993. Management utilized the BNP Three-Year Plan to identify prioritize, manage, and budget site work and were directly involved in the administration of the plan. Initiative TY102, BNP Integrated Scheduling and Three-Year Plan Administration, established work processes to ensure that additions and deletions made to the plan, and changes made in initiative sponsors/project managers, work scope, and schedules are evaluated and approved by site management. Additional accomplishments realized in this focus area include: the establishment of a Work Control Unit to consolidate and manage operations work management functions (including the planning and scheduling functions); significant reductions in the corrective maintenance backlog; development of a formal and well-defined BNP Business Plan Process; and significant improvements in material inventory reduction and control.

The original BNP Three-Year Plan identified six initiatives in this focus area. Two initiatives, TY103, Corrective Maintenance Backlog Reduction, and TY105, Inventory Control, are still ongoing. Three initiatives, TY101, Integrated Planning and Scheduling, TY102, BNP Integrated Scheduling and Three-year Plan Administration, and TY104, Business Planning Improvements, were task complete in 1993. Initiative TY106, Outage Length Reduction was cancelled during the August, 1993 update of the plan because the identified work scope was being performed under the Strategic Issue, Outage Management.

Long-term successful performance is expected in the area of work planning, scheduling, and commitment achievement as continued improvements are implemented.

## TY101, Integrated Planning & Scheduling

The Brunswick Nuclear Plant Work Control Unit (WCU) was established March 1, 1993, and directly supports our mission of producing electricity in a safe, reliable, economic, and environmentally sound manner. It was realized that for the plant to be effective, the work control process must make maximum use of the time available by insuring that all necessary production work is first planned and then scheduled during the windows of opportunity. This meant that the process must be driven by a logical production schedule and be designed to complete work planning and support activities prior to the opening of a work window. In addition, the work control process must provide effective coordination of support activities and must not divert the production work force from its primary function of performing production work. Thus, the formation of the Work Control Unit resulted. The WCU consists of two subunits: Integrated Scheduling and the Work Management Center.

The WCU was designed as a permanent work control center managed by operations, for the purpose of performing operations work management functions away from the control room. The Work Control Center (WCC) was established in conjunction with the WCU to consolidate operations work control functions, including the planning and preparation of clearances. It is managed by operations under the management of a permanently assigned, day-shift, SRO-qualified supervisor. The following benefits have been derived from establishing the WCU and WCC.

- The ability to plan ahead by assigning a schedule date to all corrective maintenance work.
- The ability to match resources to workload by developing and maintaining an integrated production schedule of preventive maintenance items, authorized modifications, open, validated, and corrective maintenance work items, and post maintenance test requirements on plant systems, components, and structures.
- Assurance that all organizational units on site work to the same plan by using the integrated production schedule to manage planning and support activities.
- The ability to provide clear and consistent direction by consolidating and strengthening work planning functions. This includes assigning an ad hoc working group to validate all unscheduled and unplanned items in the existing backlog of corrective maintenance, and integrating each validated item into the production work schedule in the appropriate on-line window or outage schedule.
- The ability to provide the work force with the best possible logistics support by preparing "task ready" work packages that are ready to implement when first scheduled.
- Improved quality of work package labor estimates to provide the means to project resource requirements.

- Defined work planning process responsibilities for all organizational units involved in the work planning process and the management tools needed to facilitate adherence to the production work schedule will be provided.

- A consolidated production work scheduling group.

- Upgrades in the production work scheduling system to provide all schedulers with on-line, PC-based access to the master (integrated) schedule.

- Improved format and utility of schedule products and development of jeopardy reports and performance indicators that all organizational units can effectively use to facilitate day-to-day work management.

- Development and implementation of an effective and efficient process to define and control the implementation of post maintenance test requirements (PMTR), including the integration of appropriate test activities into the production schedule.

- Production, maintenance, and utilization of an on-line production work plan-of-the-day to control work in progress on plant systems, components, and structures.

- An assigned ad hoc preventive maintenance program task force for the purpose of reducing the PM program scope by consolidating requirements and simplifying periodicities.

- Consolidated and simplified work management procedures and directives.

- A formalized and structured WCU Self-Assessment program for capturing, coordinating, and evaluating inputs from relevant sources to produce a practical, easy-to-manage program that supports continuous process improvements.

Additional processes currently under evaluation by the WCU include:

- The development and maintenance of a long-range resource requirement plan based on a five-year schedule of upgrades to PM program requirements, surveillance program requirements, average baseload corrective maintenance, refueling outage schedule, and programmed modifications.

- The development of a work breakdown structure for job order numbering to facilitate production work scheduling, and work management.

- Preparation of a work control process training manual that incorporates all aspects of the work control process and explains and defines each process element, its function, and its importance.

The successful implementation of initiative TY101, Integrated Planning & Scheduling, directly supports our goal of achieving world class performance. Significant performance improvements were realized in the areas of backlog reductions and Unit 1 and Unit 2 interface issues. Implementation of initiative TY101 directly contributed to the successful Unit 2 restart and record run once at power.

## TY102, BNP Integrated Scheduling and Three-Year Plan Administration

The implementation of initiative TY102, BNP Integrated Scheduling and Three-Year Plan Administration, resulted in the development of the processes required to facilitate management and implementation of the BNP Three-Year Plan. The guidelines and processes established within this initiative ensured management involvement and control of the plan, well-defined initiative sponsor and project manager responsibilities, thorough documentation of plan changes, and the monitoring tools required to ensure successful initiative and project implementation. Three updates were made to the plan during 1993 to ensure it remains consistent with the NGG Strategic Plan and Business Plan. The BNP Three-Year Plan was consolidated with the Long Range Plan and BNP Business Plan, and was renamed the BNP Three-Year Business Plan, Performance Improvement Initiatives & Projects. The defined work processes are assessed on an ongoing basis to ensure they remain consistent with NGG and BNP established work processes. Two 1993 NAD assessments and one NRC assessment found the overall administration and implementation of the plan to be satisfactory and generally effective. This initiative is task complete and closure documentation has been provided.

Much of the 1993 successful performance is due to the implementation of the BNP Three-Year Plan. The comprehensive plan was used to focus and monitor long-term improvements in the areas of work planning, scheduling, and commitment achievement; work processes; human performance; communications; and system reliability and material condition. The plan was well developed and effectively used by all functional organizations. The implementation of initiatives and projects specific to key performance areas directly contributed to improved performance in the areas of plant operations, engineering and maintenance, and plant support. Further improvements will be realized as the plan is fully implemented.

The BNP Three-Year Plan directly supports our objective to achieve world class performance. It identifies the BNP performance and plant improvements required to perform in a safe, reliable, economic, and environmentally sound manner, and provides the detailed plans for their implementation.

## TY103, Corrective Maintenance Backlog Reduction

Initiative TY103, Corrective Maintenance Backlog Reduction, directly supports the objective of obtaining world class performance by developing a method to reduce the BNP corrective maintenance backlog to manageable levels. This is currently being accomplished through proper staffing levels, process improvements, craft and supervisor training, and continuous monitoring.

Improved equipment condition and plant readiness resulted from reducing the corrective maintenance backlog. The Unit 1 backlog has been reduced by 69% and the Unit 2 backlog has been reduced by 57%. This was accomplished through the utilization of a scheduling prioritization system that separates on-line from outage maintenance. Increased management involvement in the field has resulted from the development of the Maintenance Backlog Work Authorization and Maintenance Assessment and Coaching programs. This offers the opportunity for self-assessment and process improvements to correct deficiencies. Obtainable goals have been established in the areas of ready backlog, and controlled work processes have been implemented to complete work at a rate which will meet or exceed work generation. Personnel resources have also been allocated to support achieving these goals.

BNP has made great progress in reducing the corrective maintenance backlog during 1993. This trend is expected to continue through routinely assessing existing backlogs, evaluating current backlog control programs, and implementing improved work processes as required.

## TY104, Business Planning Improvements

Brunswick Nuclear Plant's ability to effectively apply resources to the projects that provide the greatest returns relative to site goals and objectives has been greatly enhanced with the implementation of initiative TY104, Business Planning Improvements. The following actions were taken to improve the BNP Business Plan Process:

- NGG and BNP goals have been linked with the BNP Business Plan.
- Approved projects have been documented in the BNP Business Plan and a Plant Review Group (PRG) has been established to control project additions and cancellations to the plan.
- An annual/integrated Business Planning Calendar has been implemented to ensure that plans are updated in accordance with corporate and NGG guidelines.
- A process was implemented and used to develop the 1994 Budget and Business Plan. Lessons learned were incorporated into guidelines to be used for the 1995 Budget/Business Plan Process.
- FAIM Budget Tool and Processes have been implemented and follow-up training provided.
- A comprehensive 1994-1998 Business Plan has been developed and planning initiated for the next update to this plan.

The improved BNP Business Plan Process clearly identifies the goals and objectives of the organization. It also supports management in making decisions as to best use of resources. These efforts directly support our objective to achieve world class performance in the area of production cost.

## TY105, Inventory Control

Initiative TY105, Inventory Control, effectively reduced and controlled the material inventory while supporting plant needs for replacement parts and other material in 1993. Specific accomplishments include:

- Reducing the total inventory to $49.4 million from $61.7 million.
- Verifying 12% of the inventory as part of the 100% walkdown of the inventory. 10% verification of the inventory was the 1993 goal and an actual 12% was accomplished. This effort is due for completion in 1995.
- Implementation of a purchase challenge effort that resulted in a reduction in purchases of approximately $4.0 million.
- Identification of a $250,000 reduction with the standardization of parts between plants through working with peer groups.
- Implementation of a minimum/maximum review process resulted in $2.0 million in projected future savings.

Inventory reduction is crucial to providing BNP with the ability to produce electricity in a safe, reliable, economical, and environmentally sound manner. Our successful long-term performance is directly impacted by the material condition of line items in the warehouse, the availability of equipment, controlled inventory levels, and the ability to properly store hazardous material.

## HUMAN PERFORMANCE

Significant improvements were realized in the areas of Management leadership and setting expectations. While many initiatives supported this area, two key initiatives, TY204, Management Effectiveness, and TY205, Supervisory Development Program, directly contributed to the improvements in this area. Initiative TY204 fostered a five-step action plan that establishes world class performance as the highest priority and continuous improvements as a way of life at BNP. Key areas targeted in this initiative were communicating the BNP vision, mission, values, and major areas of focus; conducting an employee attitude and opinions survey; design and staffing of a new organizational structure; implementation of human resource/organizational development planning; and defining and communicating the BNP Contractor Utilization Plan. Initiative TY205 was established in conjunction with Corporate Initiatives CII-5, Supervisory Assessment Center, CII-6, Supervisory Development Program, and CII-7, Implement the Management and Succession Planning Program to provide a formal and consistent manager assessment and selection program. Improvements in human performance were further improved with the implementation of an Effective Performance Management Program, and enhancements to existing training programs, facilities, and required staffing to develop and sustain a highly qualified work force. The implementation of initiative TY206, Brunswick Facility Improvements, improved site communication, work processes, and management oversight.

The original BNP Three-Year Plan identified eight initiatives in this focus area. The five initiatives with remaining open tasks include TY201, Effective Performance Management, TY202, Training Improvements, TY204, Management Effectiveness, TY205, Supervisory and Management Development, and TY206, Brunswick Facility Improvements. All action steps for initiative TY203, Utilization/Inter-Unit Support, was completed during 1993. The scope of initiative TY207, Nuclear Revision Control System (NRCS) has been cancelled because it is covered within the action plan developed by Nuclear Business Operations (NBO) in their response to NAD Assessment C-SP-93-03. Initiative TY208, Integrated Computer Support, was cancelled per the August, 1993 update to the plan. The intent of this initiative is covered by a broader NGG initiative to reorganize and establish computer and telecommunications organizational consistency among the three nuclear sites.

Much of BNP's successful 1993 performance resulted directly from improvements sustained in the area of human performance. Corporate and site management had a very active role in oversight and control of plant activities through effective performance management, operator training program improvements, and the Nuclear Generation Group reorganization. The successful trend in this focus area is expected to continue as more initiatives are fully implemented.

## TY201, Effective Performance Management/Total Quality

During 1993, an interim Effective Performance Management program was implemented at BNP as a result of initiative TY201, Effective Performance Management/Total Quality. The objective of this initiative is to improve employee performance in the areas of safety, production, and cost through effective utilization of human resources. This was accomplished through adopting the program utilized by the rest of the company until an enhanced EPM program could be designed and implemented. Successful implementation of the program outlined in the initiative has occurred and the initiative is in the process of being closed. A newly revised and enhanced effective performance management methodology has been developed by the corporate team, and is in the process of being implemented to replace the current program. Self-assessments will be scheduled as part of the closure process to ensure that the effectiveness of this initiative continues in the new program.

Specific accomplishments resulting from the implementation of TY201 include:

- Completed supervisory and employee training in the Corporate EPM program.
- Implemented a process to ensure an annual review of job descriptions by including this into the normal performance review cycle.
- Written employee expectations were developed.
- Corporate methods were added to employee expectations.
- Assessments of expectations and their applicability to BNP goals was conducted with satisfactory results.
- The corporate Development Plan methodology was implemented.
- TQ fundamentals training was completed.
- The corporate reward system was implemented at BNP.

Overall site performance significantly improved as a result of implementing this initiative. Performance expectations were tailored to support the goals of the plant and to ensure that all levels of personnel know their role/responsibility towards achieving plant success.

Effective performance management is the key to developing world class performers. The implementation of an effective performance management program successfully equips managers with a baseline for evaluating and assessing individual performance, ensures understanding and ownership of employee expectations, and provides a consistent methodology for developing and rewarding premier performance.

## TY202, Training Improvements

Initiative TY202, Training Improvements, is designed to provide the training necessary to develop and sustain a highly qualified work force. This initiative upgrades area of identified training weaknesses by improving the training processes, facilities, and staffing, and resulted in Brunswick successfully renewing accreditation in 1993 for all twelve training programs through the National Academy for Nuclear Training. The initiative process achieved striking improvement in line ownership, involvement, and oversight of training. This, along with the training of supervisors and managers on plant systems to a Senior Reactor Operator level of knowledge are essential to ensure Brunswick's long-term positive performance and our mission to become world class. Thirty-three tasks were identified under initiative TY202, and 24 of the tasks were completed by the end of 1993. The remaining nine tasks are all on track for completion in 1994-1995.

Significant improvements in 1993 operator training programs contributed directly to our successful 1993 performance. Improved operations performance was demonstrated during the Unit 2 startup and power ascension as well as by their ability to handle casualties and off-normal performance during the annual Licensed Operator Requalification examinations. Control room professionalism significantly improved and was further developed by sending all shift crews through the INPO Control Room Team Development Course. Implementation of the Engineering Support Training Program strengthened personnel training and performance.

The success attributed to the implementation of TY202 directly supports our mission to become world class performers and ensures long-term positive performance. This success is expected to continue through the assessment of training requirements and the implementation or improvement of training programs that support these requirements.

## TY203, Utilization/Inter-Unit Support

Initiative TY203, Unitization/Inter-Unit Support was developed to provide appropriate resources within the operations unit that would support the long-term needs of the plant. Major goals of this project included providing additional personnel to ensure relief capability for each shift; providing adequate organization for staff support group; minimizing shift impact when operators are sent to license class; providing optimal resources to support work control functions; and providing experienced SRO personnel to other units on a rotational basis. All of the objectives in this initiative were met in 1993 and the initiative has been closed. A subsequent NAD assessment has verified the effectiveness of this initiative and a self-assessment has been scheduled in 1994-1995 to further validate the effectiveness of these improvements continues.

Significant improvements have been made in the number of personnel assigned to shift operations in the last year. Since May 1993, twenty-three additional operators, including Senior Control Operators, Control Operators, and Auxiliary Operators, have been added to the shift complement. Consolidation of the Work Control Center and Clearance Center has enabled the assignment of staff licensed personnel back to shift operations, further increasing the resources available to support shift operations and relief. In addition, there are now six rotational shift supervisor positions which are being used to support assignment of personnel for training and to support other units. The total authorized personnel inventory for Operations has been increased from 169 in May 1993, to a current authorized level of 201. A training pipeline has been established to support the development of personnel and to ensure an adequate number of licensed personnel are available to support operations and other plant organizations.

This initiative directly and visibly supports our mission to become world class performers by placing more personnel in direct support of plant operations. It also contributes to this goal by providing clear development opportunities for individuals and by establishing an operational focus throughout the site by the assignment of operations personnel to support other site organizations.

## TY204, Management Effectiveness

The objective of TY204, Management Effectiveness, was to establish a culture in which world class performance is the highest priority and continuous improvement is a way of life. The five-step Management Effectiveness program was established to ensure this objective was met. The five steps of the program are communicating the BNP vision, mission, values, and major focus areas; conducting a survey of employee attitudes and opinions; designing and staffing a new organization structure; implementing a human resource/organizational development plan; and defining, communicating, and tracking the BNP contractor utilization plan. With the exception of the employee survey, all five action steps were successfully completed in 1993.

Many efforts were undertaken to communicate the new CP&L, NGG, and BNP direction. Beginning in the fall of 1992, "all hands" meetings were conducted in which Mr. Cavanaugh articulated the new vision of CP&L as a "premier" utility with performance in the top quartile of the industry. Early in 1993, the major focus areas for company, NGG, and BNP performance were reinforced through the announcement of the overall company and nuclear-specific 1993 employee incentive goals. These incentive goals delineated specific targets for performance, and were tracked and reported in InfoBriefs on a monthly basis. At year-end, BNP employees had met three of the four Brunswick-specific goals. In addition, "4Cs" meetings were instituted as a monthly opportunity for employees to express their compliments, convictions, concerns, and comments directly to the senior management in NGG.

A company-wide employee opinion survey was conducted in the summer of 1993. Eighty-six percent of company employees, 66.2% of NGG employees, and 66.9% of BNP employees participated in the voluntary survey. Managers received preliminary survey results in November and a summary of company results was issued to all employees in December, 1993. Brunswick-specific results are being communicated though a series of unit-level meetings, during which employees are reviewing the results, providing comments, and making suggestions for action planning.

The design and staffing of the new BNP structure from unit level and above was completed in the spring of 1993 and announced on June 1, 1993. The new management team then followed an established company process to structure and staff the organization below the unit level; these decisions were announced on August 26, 1993. Although this action is considered task-complete, efforts continuously evaluate and upgrade organization structure and staffing to ensure optimal operations remain a part of day-to-day improvement efforts.

A human resource strategic planning model was developed to support human resource strategic planning throughout NGG in the spring of 1993. Department and section-level managers in NGG were trained to use the process in May-June, 1993, and BNP developed a plan for input into the NGG strategic plan in conjunction with the 1994 Budget and Business Plan. This activity has been incorporated into the annual business planning process.

Contractor utilization guidelines were issued to all NGG department managers on December 1, 1992. Based on these guidelines, BNP developed a contractor utilization plan to set target numbers for baseline, project, and outage contractors. These targets are reviewed on an ongoing basis and are tracked/reported to the Nuclear Business Operations Department and plant management. BNP will continue to focus on effective use of contract labor through the group's utilization plan.

Many of BNP performance improvements resulted directly from increased management effectiveness. Significant improvements were realized in plant operations and engineering as a result of the reorganization. Key management positions have been filled with experienced managers and oversight of Unit 1 and Unit 2 has been separated. Relocation of engineering support to the site is currently underway. The communication of BNP direction, implementation of Human Resources/Organizational Development planning, and increased control of contractors continue to support management's ability to communicate with employees, fill key vacancies, and control work quality. The employee opinion survey has provided valuable information to management regarding employee issues and suggestions. Survey findings also provide the baseline data required to support future evaluation of management performance.

Improved long-term performance at BNP will be directly influenced by the clear communication of CP&L, NGG, and BNP direction, the realignment of the organization and staffing to support this direction, and more effective planning for the utilization of both CP&L and contract personnel. Periodic employee surveys will provide valuable feedback to management on employee issues and will provide an ongoing channel of communication between management and employees. The communication of the BNP vision, mission, values, and major focus areas has included specific targets for performance in the areas of safety, performance, and cost. These targets clearly outline the level of performance expected for BNP to achieve world class performance. The redesign and staffing of the organization, as well as improved planning for use of company and contract personnel, will support the ability of management to achieve these targets.

## TY205, Supervisory Development Program

Initiative TY205, Supervisory Development Program was established specifically to implement corporate initiatives CII-5, Implement the Supervisory Assessment Center; CII-6, Complete Training in the Supervisory Development Program, and CII-7, Implement the Management and Succession Planning Program. All three have been successfully implemented at BNP with the exception of development planning for high-potential non-managers. This is expected to complete by August 31, 1994. This success is directly attributed to the close coordination and a supportive working relationship between BNP management and the Human Resources Department. In those cases where individuals in an identified training population could not attend scheduled activities, arrangements have been made to include them in 1994 activities.

The assessment center process was formally begun in July, 1993 by means of an announcement from the NGG Executive Vice-President. In addition to providing assessment center opportunities for BNP personnel, this initiative also provides a video-based assessment for senior/lead employees and pre-supervisory training course for this population of employees. Seventeen personnel from BNP attended the assessment center, twenty-one attended video assessment sessions, and seventeen attended pre-supervisory training. These development activities were all begun during 1993 and BNP personnel are taking increasing advantage of these program elements.

Ninety-one supervisors from BNP attended the Supervisory Development Program (SDP) in 1993. In addition to attending the four weeks of classroom training, four structured follow-up sessions were conducted for SDP graduates throughout the year on a quarterly basis. These sessions explored course application successes, barriers, and suggestions for sustained application of course content to the work environment.

Thirty-four BNP managers attended the one week management development program, "Leadership in Transition," conducted for all NGG unit-level and above managers. The course provided change management skills to the participants, increased their understanding of the current training being conducted for first-line supervisors, and provided other learning opportunities designed to provide skills and a strategic outlook for managing successfully in changing environments.

Advancement has also been recognized in the area of succession planning. Short and long-term candidates were identified for key department, section, and unit-level positions. These candidates received group-wide visibility among senior management, and development plans were created for individuals in selected positions.

Effective management actions were displayed throughout 1993. Key vacancies have been filled with experienced managers. The Supervisory Assessment, Supervisory Development, and Management Development programs provide management with new tools to evaluate incumbents, provide developmental feedback, and select those employees who are prepared to move into more senior positions. The increased opportunity for evaluation, development, and communication offered by these programs has contributed to improved levels of management performance. Increased emphasis on succession and development planning will further support the ability to successfully develop employees and fill key vacancies.

The implementation of initiative TY205 provides consistency, quality, and objectivity to the process of selecting and developing BNP managers. The assessment and selection process for new supervisors, and the succession planning for key positions, will have a positive and lasting impact on long-term plant performance. Specific activities were included in both the Management Development Program and the Supervisory Development Program to define world-class performance, illustrate CP&L's commitment to it, show the gap between current performance and world-class performance, and clarify manager and supervisor roles for achieving it.

## TY206, BNP Facility Improvements

Significant progress in BNP's long term goal of providing a better quality of life for the work force was realized during 1993. This progress is a direct result of implementing initiative TY205, Brunswick Facility Improvements. A Master Facilities plan that provides permanent facilities for all CP&L employees and centralizes employees and equipment has been created as a result of this initiative. Implementation of the plan began in 1993 and is scheduled to complete in 1994. The plan was developed through the following process:

- Personnel requiring permanent office space inside and outside the protected area (including NED and corporate personnel) were identified.
- The existing facility accommodation capabilities were assessed.
- The types of facility upgrades and new facility requirements, potential facility locations, types of personnel that should be housed in each facility, and the facility interface requirements were identified.

The Master Facilities Plan includes construction of the following new buildings:

- Operations and Maintenance Support Building
- Technical Training Facility
- Sewage Treatment Plant
- Technical and Administrative Center (TAC Building)
- Snubber Repair and Hot Calibration Shop
- Single Point Access Facility
- Tool Decontamination Facility

It also includes the following facility upgrades:

- Service Building Upgrade
- TSC/EOF Building Upgrade
- Main Storeroom HVAC and Power Supply for Hot Shop
- CRD Room Upgrade
- Control Room Upgrade

Significant progress has been made in implementing the plan at BNP. Specific accomplishments are as follows:

- The 140,000 square foot Technical and Administrative Center (TAC Building) was completed with the completion of the new parking lots and roads around this facility. The completion of this facility allowed the removal of many trailers and other temporary structures.

- Construction of the Snubber Repair and Hot Calibration Shop began in 1993. The project is progressing well and will complete as scheduled in 1994.

- Construction on the new tool decontamination facility started in 1993 and is scheduled to be completed in 1994 before the end of the Unit 2 outage. BNP will be able to use this facility for tool decontamination during the next refueling outage.

- Removal of trailers and many temporary facilities (100 out of 154 trailers have been moved from the site).

- Construction was started on a new 76,176 square foot Operations and Maintenance Support Building.

- Construction was started on a new 28,222 square foot Technical Training Facility.

- Upgrades to the control room were started. The painting, carpet replacement, ceiling painting, and furniture refurbishment/replacement was completed. The remaining control room upgrades are scheduled to complete in 1994.

Many BNP facility upgrades and improvements were realized during 1993. The improvements and removal of trailers improves the appearance of the site and is an indicator of the plant material condition. The centralization of work groups has significantly improved communication, work processes, and management oversight. Work group effectiveness, problem identification, and identification of issues and close oversight were significantly enhanced through this centralization.

The facilities plan directly supports our goal of achieving world class performance. It creates a professional/industrial site appearance, fosters employee professionalism, and promotes employee pride and ownership. It positively impacts our ability to perform in a safe, reliable, economic, and environmentally sound manner by improving operational effectiveness, worker efficiency, and communication.

## WORK PROCESSES

Initiatives in the BNP Three-Year Plan that are specific to improving key work processes resulted in the implementation of more efficient and better developed programs. Improvements were realized in the areas of the administration and control of plant operating procedures, the process for implementing projects and modifications, the identification and processing of corrective actions. Further improvements were sustained in the area of work processes with the development of a comprehensive backlog and standards monitoring program, improved clearance process, development of a centralized document control program, and a regulatory commitment identification and tracking procedure.

The original BNP Three-Year Plan identified ten initiatives in this focus area. The five initiatives with remaining open tasks include TY301, Improve Procedure Control and Content, TY302, Improving the Modification Process, TY303, Improved Ability to Identify and Correct Problems, TY305, Clearances/Process Improvements, and TY308, Centralized Document Control Program. The action steps for two of the open initiatives have been completed since December 31, 1993 and the closure documentation is in process. Initiative TY304, Backlog Reduction, and TY309, Improve Management of Regulatory Commitments, were task complete in 1993. Three initiatives were cancelled per the August, 1993 update of the plan. Initiative TY306, Health Physics Program Improvements, was cancelled because the identified tasks were covered under other programs, initiatives, or existing in-house processes. Initiative TY307, Implement/Augment BNP Local Area Network, was cancelled because the installation of the BNP Local Area Network (LAN) is being performed in coordination with the corporate plan for installing company-wide LANs. Initiative TY310, Assess Implementation of SAT Items, was cancelled because Staff Assistance Team (SAT) improvements are incorporated in BNP self-assessment, strategic planning, and business planning processes.

The improvements sustained in the area of work processes during 1993 directly contributed to the smooth Unit 2 restart and successful plant performance. The improved Procedures Administration Program has resulted in a reduction in the number of procedural compliance errors and the number of temporary changes to procedures. The equivalent evaluation process and the minor mechanical modification processes were utilized to resolve Unit 2 outage issues. Effective BNP self assessment efforts directly contributed to the successful 1993 performance. Much of BNP's successful performance is contingent upon the successful implementation of improved and well-developed work processes. Safe, reliable, economic, and environmentally sound performance will be realized at BNP as the outstanding initiatives in this focus area are fully implemented.

## TY301, Improve Procedure Control Process and Procedure Content

A consistent approach to procedure development and administration has been established at BNP as a result of implementing initiative TY301, Improve Procedure Control and Content. This program improves the overall administration and control of procedures in the Plant Operating Manual (POM) for BNP. This program centralized administrative responsibility for procedures maintenance, eliminated inconsistent and independent production of procedures by multiple units, and centralized the procedure control and preparation guidelines. Some of the major improvements or enhancements to the procedures program are as follows:

- Established a "Procedure Coordinators" group comprised of representatives from the major units and sub-units responsible for procedures in the POM. This group met twice per month during 1993 to address procedure administration issues and to provide a consistent approach to procedure development and revision at BNP.

- Identified a "Procedure Sponsor" for each procedure contained in the POM. The sponsor is assigned according to the approval authority matrix for that procedure and is responsible for development, maintenance, technical adequacy, review, and recommendation for approval of the procedure and subsequent revisions. The sponsor also evaluates requests for revision to his/her procedure and initiates appropriate action.

- Clarified the verification (review) process to better define administrative verification and technical verification to provide for improved technical quality.

- Established a clearly defined validation process to ensure that the actions specified in the procedure can be performed effectively by the individual or group identified in the procedure.

- Improved the biannual review program by defining review criteria and performing the review on an individual procedure basis. The new program also allows for the biannual review to be included in the normal revision process as long as the review criteria are met.

- Established an "effective date" for procedures or procedure revisions to allow sufficient time for training after approval when necessary and to ensure that only one revision of a procedure is being used at any one time.

- Formalized and standardized the process for requesting new procedures or procedure revisions through the use of a Procedure Action Request (PAR). Use of the PAR facilitates Sponsor review and evaluation of procedure revision activities.

- Recommended a limit on the number of partial revisions that may be made on a procedure before a full revision is required. Limiting the number of partial revisions will allow flexibility for quick revisions to procedures when appropriate while at the same time improving the usefulness of procedures and minimizing the possibility of errors on the list of effective pages.

- Provided early notification to the Training Section for new or revised procedures and allows for the procedure sponsor and the Training Section to determine the appropriate type of training, who will provide the required training, and when the training should be given.

- Provided documenting procedure review comments and resolution of these comments on comment sheets and a process for retaining these sheets as part of the procedure revision history file when appropriate.

- Established an electronic "Procedure Development History File" that is maintained but not distributed as part of the procedure. This file would facilitate future revisions by providing the basis or information relating to development of the previous revision.

- Improved the temporary change process to define that these changes may be good for a period of 60 days, with one possible extension of 30 days , and to provide for distribution of temporary changes to controlled copyholders after final approval.

- Consolidated, standardized, and enhanced instructions for procedure writers. This action will improve procedure preparation and review time and should provide procedures that are easier to read and follow during performance in the field.

Improvements in the Procedures Administration Program directly contributes to successful plant operations performance. Improving the procedures in the POM has resulted in the need for fewer temporary changes to procedures and reduced the number of procedural compliance errors. This has helped to improve plant performance in all areas and will continue to contribute to optimum performance in the future.

TY301 provides for professional-looking procedures that are indicative of a world class plant. It also provides the foundation and methodology for an upgrade in the quality of PM procedures at BNP that will ensure successful long-term performance at the plant. In addition, it provides a foundation for establishing a procedures hierarchy at BNP and an administrative procedures upgrade program that better defines administrative requirements and processes, thus eliminating redundant and unnecessary procedures.

## TY302, Improving the Modification Process

Preparation of plant modification installation instructions and acceptance tests was transitioned from NED to BNP as a result of implementing initiative TY302, Improving the Modification Process. Several types of design change enhancements were incorporated into the modification process and the specific areas of improvement are as follows:

- The implementation of the Equivalent Component Evaluation Procedure (Engineering Procedure 3.4). Approval and implementation of this procedure provided a process for resolving over 400 plant change issues in 1993 and thus eliminated the need for engineering work requests.

- Enhanced guidance for maintenance on conduit supports and non-safety related pipe supports, and the resolution of corrective maintenance WR/JOs without EWRs.

- Streamlined the minor structural repairs design change process.

- Approval of field-routed small bore non-safety related pipe support and spacing design specifications guide.

- A minor mechanical modification was approved that provides the process for implementing minor mechanical design changes by field revision.

- Implementation of a streamlined approach to providing setpoint change plant modifications.

- Completion of engineering support personnel training enrollment.

- Formation of a corporate PQT for the purpose of developing a design change manual to ensure further enhancements to the design change process.

- Formation of the CAD/CAE migration team for the purpose of improving engineering document usage.

The equivalent evaluation process and the minor mechanical modification directly contributed to improved engineering performance. Both processes were utilized to resolve Unit 2 outage issues in a timely manner, thus directly contributing to the overall good performance of the unit. A downward trend in the area of EWR backlog has also been realized as a result of implementing this initiative.

Effective engineering processes are required to reach world class performance and the implementation of TY302 directly supports this objective. The creation of efficient and well developed engineering processes at BNP are stepping stones to successfully performing in the top quartile in the industry.

## TY303, Improve Ability to Identify and Correct Problems

Brunswick Nuclear Plant personnel were highly successful in identifying and correcting problems in plant performance during 1993. This success is due primarily to the implementation of initiative TY303, Improve Ability to Identify and Correct Problems. Implementation of this initiative resulted in the development of a self-assessment program, root cause analysis program, and a corrective action program that ensures the critical evaluation of plant processes and products.

A sitewide self-assessment program (PLP-25) was established and implemented in 1993 which formalized the self-assessment philosophy, provided a consolidated statement of both formal and informal self-assessment methods, and established a formal assessment of activities. Successful implementation of this program concluded with personnel training. Root cause analysis has become an integral part of normal BNP business. Industry operating experience information is being provided as a baseline for root cause analysis. Responsibility for root cause analysis has also been transferred to line organizations to strengthen ownership, and training has been provided to management to ensure they possess the skills required to be proactive in identifying and correcting problems. The final step of implementation included the development of a Corrective Action Program (CAP). Implementation of the CAP includes the development of sub-programs and accompanying procedures within each organization, development and utilization of a simple adverse condition form, corrective action program trending that includes level III adverse conditions for all unit sub-programs, and management review of Adverse Condition Reports (ACRs).

Much of BNP's 1993 successful performance resulted directly from its improved self-assessment ability. Line management self assessment programs are effective, comprehensive, and sufficiently detailed to identify and correct previously identified performance problems. Successful site self-assessment activities assured readiness of Unit 2 to restart from a year-long unplanned outage and improved root cause analysis are examples of improved BNP self-assessment practices.

Significant improvements were realized in the area of plant operations during 1993. A standard of excellence was established in this area as a direct result of implementing this initiative. Effective self-assessment will provide early identification and correction of problems, thus ensuring the same standard is established in the areas of maintenance, engineering, and plant support.

## TY304, Backlog Reduction

Initiative TY304, Backlog Reduction, was successfully implemented in 1993 and the initiative task closure documentation is being processed. Backlog priorities and targets have been established and will be tracked via in-house management and tracking processes. Implementation of this initiative resulted in the development of a comprehensive backlog and standards monitoring program that establishes backlog priorities and targets. Backlog reduction plans have been developed and implemented to monitor and reduce the following areas of backlog:

- Maintenance Backlog
- Design Basis Documents
- Engineering Drawings
- Procedure Revisions
- Vendor Manual Updates
- Probability Risk Assessment (PRA) Model Updates
- Equipment Database System Updates
- Temporary Conditions
- Corrective Actions

Backlog reduction in maintenance procedure deficiencies was realized in 1993. BNP appropriately prioritized and substantially reduced the maintenance backlog. A significant reduction in the number of outstanding engineering work requests resulted from implementing this initiative.

Providing close oversight of the reduction and management of backlogs directly supports our mission to become world class performers as well as improve overall performance and reliability. Backlog reduction ensures BNP success by preventing the buildup of material condition problems, operator work arounds, and a tolerance for unacceptable conditions which inevitably degrade plant reliability and regulatory image.

## TY305, Clearances

Improving the effectiveness and efficiency of the BNP clearance process without losing any safety assuredness was the primary objective for establishing initiative TY305, Clearances. An aggressive goal of completing the clearance improvement process prior to the Unit 2 refueling outage was established. A multi-disciplinary team was formed in December 1993 to ensure this goal was met. The following areas of focus resulted in the development of an effective and efficient BNP clearance process:

- Personnel and equipment safety.
- Streamlining and simplifying the clearance process.
- Training of personnel on the new process.

A simplified clearance procedure that focuses on personnel and equipment safety was presented to management in March 1994. Training was provided to site personnel and the improved procedure was fully implemented March 21, 1994. Implementation of this initiative will directly contribute to completing the Unit 2 outage on time and a smooth restart of Unit 2.

## TY308, Develop Centralized Document Control Program

An enhanced and more effective Document Control Program has been established at BNP through the implementation of initiative TY308, Develop a Centralized Document Control Program. Revision 51 to ORMP-003 outlines the centralized document control program. An integrated plan for document control enhancements was developed and implementation of the enhancement plan began in 1993. Further enhancements will be implemented in 1994 with the development of site administrative procedures for document control and the training of site personnel to the requirements of the new procedure.

The following major improvements have been implemented in the Document Control Program during 1993:

- Implemented an enhanced "verified working copy" program to ensure that quality-related work activities at BNP are performed using a copy of the required document that has been verified to be the latest approved revision, including any outstanding change documents that have not yet been incorporated into the document.

- Expanded document control support in the plant libraries to assist plant personnel in implementation of the enhanced "verified working copy" program. Document control personnel are now available in at least one plant library 24 hours per day.

- Established a document control conducted audit program to ensure that controlled copy sets of documents contain the latest revisions of the documents and to ensure that documents are available for use at appropriate work locations.

- Maintained better control over the documents distribution by reducing the number of controlled copyholders and information copyholders on site by 557 copyholders. This resulted in a reduction of 122,786 documents at BNP during 1993.

- Streamlined the document retrieval process by adding the "Select" distribution classification to the Document Control Program. This classification allows a copyholder to receive all assigned documents and updates to those documents without requiring formal receipt acknowledgement.

- Performed an audit of the drawings required in key locations and provided up-to-date drawings as required in support of startup activities on Unit 2.

- Assisted the Maintenance Unit in establishing a program to ensure that technically deficient procedures were placed on administrative hold and removed from controlled distribution locations until the procedures could be revised.

- Developed and implemented procedure OAP-008, Document Distribution and Control.

The implementation of a new and improved Document Control program directly contributed to successful 1993 plant support performance. Improvements in the program resulted in improved support for all plant activities by ensuring work was performed according to the latest document revisions and that maximum work efficiencies were obtained from having the documents located in required work areas. The enhanced document control program also supported the reduction in the backlog of maintenance procedures, and ensured that the Emergency preparedness documents in the Technical Support Center and the Emergency Operations Facility remained current. All areas of plant performance will improve as further enhancements to the Document Control Program are implemented.

Implementation of the enhanced Centralized Document Control Program positively impacts BNP long-term performance by reducing the costs associated with document distribution, reducing the time required to obtain the proper documents for job evolutions, and by improving worker efficiency in terms of the amount of time required to research documents to determine current plant configuration. It will also reduce the number of personnel errors and plant incidents that might result from usage of incorrect or out-of-date documents and increase the confidence of plant personnel when using controlled documents. This initiative directly supports our mission to perform work in a safe, reliable, economic, and environmentally sound manner by ensuring the most current document revisions are available for performing work.

## TY309, Improve Management of Regulatory Commitments

Implementation of initiative TY309, Improve Management of Regulatory Commitments, has resulted in the development and implementation of a regulatory commitment identification, control, and tracking procedure. The development of a sitewide commitment procedure has resulted in a reduction in the number of missed regulatory commitments, a well-defined commitment criteria, and the development of a commitment approval and management process. All seven tasks identified under this initiative have been completed and closure documentation is in process.

Implementation of the new commitment management procedure removes ambiguity or obscure commitments by reducing the number of actions which are mistakenly assumed to be commitments to regulatory agencies, and ensuring that the appropriate management authority is utilized when making commitments. Training has also been provided to management and all users to further ensure successful management and control of BNP commitments.

The overall level of safety performance at the Brunswick facility has significantly improved during 1993 as a result of implementing this initiative. Corporate and site management attention to plant safety, and oversight and control of plant activities significantly improved. The implementation of the commitment management procedure directly contributed to this success by clearly identifying BNP commitments.

Commitment achievement is critical to achieving world class performance. Clearly identifying BNP commitments, directing management attention and company resources to those commitments, and successfully completing them will significantly improve long-term BNP performance.

## COMMUNICATIONS

Effective communication is becoming a way of life at Brunswick. Internal and external communications have significantly improved at BNP, and sitewide focus has been directed to effective communication. This improvement primarily resulted from the implementation of initiative TY401, Site Communications. TY401 provides a formal communication plan that will improve line management communication by broadening the scope of communication activities. This concept has been reinforced by incorporating effective communication into employee expectations and performance evaluations, and developing training programs to equip managers and site personnel with effective communication skills. Platforms for open communication between site personnel and senior management have been created via the 4Cs and All Hands meetings. The Nuclear News, Monday Memo, Straight Talk, Outage Updates, and Late Breaking News publications also communicate current issues and management concerns to site personnel. Computerized communication systems have been implemented to allow employees ready access to personnel and plant information. Communication surveys are conducted annually to assess the effectiveness of site communications.

Initiative TY401, Site Communication Plan, was the only initiative identified in this focus area. All action steps identified in this initiative were completed in 1993 and the closure documentation has been completed. The effectiveness of site communications is assessed via annual communication surveys. However, management continually assesses its effectiveness as part of routine BNP business and makes improvements as required to ensure effective site communication.

## TY401, Site Communication Plan

Sitewide focus has been directed to effective communications, and internal and external communications have improved as a result of implementing initiative TY401, Site Communication Plan. The following improvements were realized in 1993:

- A communications professional has been established at BNP to direct the site communications plan and to continually assess its effectiveness.
- Computerized communications systems have been implemented to provide employees with ready-access to current plant, personnel, and company information.
- Communication platforms have been created via the 4Cs and All Hands Meetings to allow for open and one-on-one communication between management and site personnel.
- The Nuclear View, Straight Talk, Monday Memo, Power Ascension Update, and Outage Status publications have been created to ensure employees are kept abreast of current issues, management concerns, and company goals.
- The importance of effective communication has been reinforced by incorporating it into all employee performance evaluations.
- Training has been provided to all employees to ensure they understand their effective communication responsibilities and to equip them with the skills to be effective communicators.
- Annual communication surveys are being performed to monitor the effectiveness of site communications. The most recent survey results indicate that employees believe site communications have significantly improved. Specific areas of improvement include management communications, plant news coverage, and informing employees of breaking news.

Improved site communications directly contributed to the successful plant performance during 1993. Corporate and site communications improved significantly and the communication between management and employees, organizations, and departments is more effective. The good communication between senior reactor operators and reactor operators, and the clear communication of the operational readiness expectations to site staff, are additional examples of improved BNP communications. Site communication effectiveness will continue to be monitored by management and enhancements will be made as required.

Effective communications is a key element in world class performance. It is critical to successful long-term performance at BNP and is the responsibility of every employee. The BNP communication plan directs employee, management, and organizational focus on effective communication, and provides the vehicles to make it possible.

## SYSTEM RELIABILITY & MATERIAL CONDITION

Significant improvements were realized in the area of system reliability and material condition. Many of the improvements resulted directly from upgrades to existing BNP programs. Specific programs that underwent improvements during 1993 include the Preventive/Predictive Maintenance Program, Cooling Water Reliability Program, Plant Engineering Program, and ISI/IST Improvement Testing Program. Material condition improved significantly as a result of implementing initiative TY510, Painting to Upgrade Material Condition, and initiative TY502, Corrosion Preventive Maintenance Program. The implementation of initiative TY511, Dose Reduction/ALARA Initiatives, significantly contributed to improved material condition through the Recirc Decontamination Plan and the Reactor Water Cleanup Phase Separator Room cleanup. It also directly contributed to a significant reduction in the BNP total absorbed dose.

The original BNP Three-Year Plan identified fifteen initiatives in this focus area. Eight initiatives are not task complete. These initiatives are TY501, Preventive/Predictive Maintenance Program Improvements; TY502, Corrosion Preventive Maintenance Program; TY505, Cooling Water Reliability Program; TY506, Plant Engineering Program Upgrade; TY507, ISI/IST Testing Improvement Program; TY510, Painting to Upgrade Material Condition; TY511, Dose Reduction; and TY512, Environmental & Chemistry Program Improvements. Seven initiatives were cancelled in the August, 1993 update to the plan. The work scopes for initiatives TY503, Design Basis Reconstitution Program, TY504, Equipment Data Base System (EDBS), and TY508, AC Source Improvement Project, are identified in various projects within the BNP Three-Year Plan. The objectives of initiative TY509, Management of Temporary and Substandard Conditions, have been partially met through the development and implementation of a Temporary Modification Identification and Control Program (PLP-22), and the remaining objectives will be addressed through internal resources and existing programs/plans. Initiatives TY513, Megawatt Improvement Projects, TY514, Improve Plant HVAC Systems, TY515, Fire Protection Upgrade Project, were cancelled because the objectives of these initiatives are also currently being addressed through internal resources and processes. Stand-alone initiatives are not required to implement these improvements. Initiative TY512 was unscheduled and unfunded during 1993. It has been scheduled for task completion in 1994.

Many improvements were realized in the area of system reliability and material condition during 1993. The effectiveness of the BNP Preventive Maintenance Program and the improved material condition of the plant are specific examples these improvements. Further program enhancements and material condition improvements will result in safe, reliable, economic, and environmentally sound performance.

## TY501, Preventive/Predictive Maintenance Program Improvements

The implementation of initiative TY501, Preventive/Predictive Maintenance Program Improvements, has resulted in some initial enhancements in the BNP Preventive Maintenance Program. The following identifies the major accomplishments during 1993:

- The PM Basis Document (PMBD) was reconstructed to identify all existing preventive maintenance tasks and their applicable reference documents.

- A review was performed on all preventive maintenance task schedule frequencies, with emphasis being placed on outage activities.

- An assessment of the BNP Predictive Maintenance Program was performed, including a comparison to the programs of top industry performers, and an action plan for implementing improvements to the BNP Predictive Maintenance Program was formulated and initiated.

- Reliability Center Maintenance (RCM) studies were conducted on four plant systems and the results are in the process of being implemented.

The effectiveness of our preventive maintenance program directly impacts our ability to provide electricity in a safe, reliable, economic, and environmentally sound manner. Implementing sustained improvements in the BNP Preventive Maintenance Program will ensure successful long-term performance at BNP in the area of equipment reliability and availability.

## TY502, Corrosion Control

Significant improvements were realized as a result of design changes that were generated under initiative TY502, Corrosion Control. Specific areas of focus in 1993 included corrosion betterments, rattlespace in-leakage, and storm drain cleanup.

Design changes were issued to replace corroded pipe and conduit supports as well as other structures. These items are primarily located in the service water and circulating water intake area; with a small number also in the area of service water booster pumps. This task resulted in noticeable improvement in the material condition of the circulating water and service water intake areas. Design changes included the use of more corrosion-resistant materials and steps to prevent recurrence of a corrosive environment. These enhancements will help prevent corrosion in these areas in the future.

A study of options for solving the problem of water collecting in the rattlespaces (vertical pipe chases between the reactor buildings and adjacent buildings) was performed. Recommendations were approved by the management review group for actions to be taken and for beginning the design phase in 1995.

Improvements in the area of storm drain cleanup included the development and implementation of a special procedure for the flushing of the plant storm drain system, hydrolasing and vacuuming of the piping system, the removal of gravel and silt that had collected over the years, and disposal of the blockage material. As a result, yard drainage will be improved and the potential for water in-leakage into buildings will be reduced. Recommendations for improvements to prevent recurrence of drain system blockage (e.g., aprons around drains and periodic flushing, etc.), and a corrosion preventive maintenance program will be developed in 1994.

The development and implementation of a corrosion preventive maintenance program enhances our ability to achieve world class performance in the areas of maintenance and engineering. Corrosion of plant equipment and material will be prevented or mitigated, thus ensuring optimum equipment and plant performance and reliability. These improvements directly support our mission to be perform in a safe, reliable, economic, and environmentally sound manner.

## TY505, Cooling Water Reliability Program

The purpose of initiative TY505, Cooling Water Reliability Program, is to develop and implement a program to predict, identify, repair, and protect the Circulating Water (CW), Reactor Building Closed Cooling Water (RBCCW), Turbine Building Closed Cooling Water (TBCCW), and Service Water (SW) systems from degradation caused by corrosion/erosion. Most of the program development was conducted during 1993 with implementation of the program starting at the end of 1993. The Cooling Water Reliability Program is now in a position to actually start implementation of non-destructive examinations and subsequent assessments of the condition of the piping systems. The major 1993 accomplishments for this initiative are as follows:

- Contacted other sites to obtain copies of the erosion/corrosion programs for other utilities.
- Reviewed other utilities' programs for applicability to BNP.
- Contacted EPRI and INPO to obtain industry threshold criteria to determine physical limits for erosion/corrosion potential for cooling water piping systems.
- Developed a written procedure to define the scope of the BNP program and obtained a peer review by NED.
- Determined susceptible locations in piping systems that are included in the program.
- Began performing non-destructive examinations of selected locations.

In addition to the accomplishments directly related to development and implementation of the initiative, the following administrative tasks were performed:

- Specific Cooling Water Reliability Program incentive goals and criteria for a successful program were established.
- A self-assessment report was prepared.
- Changes were initiated for the program to reflect changes in scope, changes in completion dates (based on changes in refueling outage dates), and ongoing improvements in the effectiveness of the program.

Establishment of an effective Cooling Water Reliability Program at BNP enhances our ability to achieve world class performance in the areas of maintenance and engineering by providing a proactive approach for identifying and correcting potential piping failures. Implementation of this program ensures that repairs/replacements are conducted in an orderly manner rather than as a reactive evolution upon failure. Accurate monitoring of erosion rates and

predicting remaining service life of the piping system, repairs, and replacements allows for proactive identification and repair of piping deficiencies. This monitoring will also result in improved safety system availability for the RHR, SW, and Diesel Generator Systems and a reduction in LCO(s) or unit threatening evolutions as a result of throughwall leaks/failure in Cooling Water System piping.

## TY506. Plant Engineering Program Upgrade

The implementation of initiative TY506, Plant Engineering Program Upgrade, resulted in many improvements to the Technical Support Engineering Program. A primary focus in the development of the engineering program during 1993 was directed at evaluating the programs of other world class plants and incorporating these practices into the BNP program. The following actions resulted in the implemenation of an improved Technical Support engineering program at BNP:

- Assessments of other world class Engineering Support Programs were performed and benchmarks for the BNP Technical Support engineering program were established.
- World class performance practices were incorporated into the development of the new program.
- Plant visits were made to world class plants to assess the results of their programs.
- Customer surveys were performed to define specific needs of the BNP organization.
- The current engineering support organization was evaluated for optimization.
- A rigorous self-assessment program was implemented in Technical Support that resulted in improved engineering performance and set the standard for the site. It was used as a pattern for the site self-assessment procedure (PLP-25).
- Dependency on contract personnel was significantly reduced.
- New performance measures were established and the Technical Support Engineering training program was converted to the "Engineering Support Personnel (ESP) Program".

The improvements in the Technical Support Engineering Program directly contributed to the improved 1993 performance in the areas of plant operations and engineering support. The improved support to the site operations and maintenance efforts contributed to the smooth performance of Unit 2 on restart and to the record run once at power.

A strong and efficient engineering organization is required for BNP to perform in a safe, reliable, economic, and environmentally sound manner. This organization must provide technically correct engineering support to the plant in a cost effective manner. It directly contributes to the material condition of the plant and the level of performance attained by plant systems and equipment.

## TY507, ISI/IST Improvement Testing Program

Improved plant performance and optimization of the BNP ISI/IST Program are benefits derived from the implementation of initiative TY507, ISI/IST Improvement Testing Program. The objective of this initiative is to develop and implement a program to upgrade the BNP Inservice Inspection (ISI) and Inservice Testing (IST) programs. Significant program improvements have been made in the programs during the first year of implementation and additional enhancements will be implemented in 1994-1995. The following accomplishments were realized in 1993:

- Detailed assessments were completed.
- A complete review of existing implementing test procedures was performed.
- ISI Program Basis Documents were developed.
- Administrative control procedures for the ISI/IST processes were developed.
- Test connections required for support testing were identified.
- RPV vessel examinations were included in the ISI/IST Augmented Program.
- Personnel training on the ISI/IST Testing Program was provided.

The ISI/IST Program improvements directly contributed to improved plant operations and engineering support performance during 1993. The improved programs, personnel training, and strong ISI/IST engineering support helped to ensure smooth startup of unit 2 and the world class record run once at power.

The maintenance and performance of the critical testing required for the ISI/IST Program promulgates an optimum administrative and implementing organization toward the mission of attaining world class performance. To that end, this organization must provide technically accurate testing requirements and engineering support in a cost effective manner. The testing must be accomplished in the safest and most efficient manner. The ISI/IST Program is an integral part of achieving world class performance at BNP.

## TY510, Painting to Upgrade Material Condition

Implementation of initiative TY510, Painting to Upgrade Material Condition, resulted in the development of a five-year painting plan that is currently being implemented at BNP. The five-year schedule was accelerated during 1993 and approximately 740,000 square feet have been completed. Implementation of the BNP Painting plan has resulted in the following accomplishments:

- A professional and improved plant working environment has been created.
- The overall material condition of the plant has significantly improved by establishing higher material standards.
- Employees have adopted a sense of pride and ownership for plant material condition and housekeeping.
- Contamination dress-out requirements have been greatly reduced by eliminating contaminated areas.
- Plant lighting has been greatly enhanced.
- Several radiation sources were eliminated by removing embedded radiation sources from concrete floors during floor preparation.
- A color-coded piping identification system has been implemented. This will directly support plant operations in the identification and walkdowns of piping systems.

Significant improvements have been realized in the material condition of the plant as a result of implementing this initiative. The material condition of the plant is indicative of its performance, and is a basic element of achieving world class performance. It promotes an attitude of performance excellence, establishes higher standards of material condition, conveys the importance of good housekeeping, and fosters ownership and responsibility for the plant at every level.

## TY511, Dose Reduction/ALARA Initiatives

Significant improvements were realized in the area of personnel dose reduction and ALARA at BNP during 1993. The implementation of initiative TY511, Dose Reduction/ALARA Initiatives, directly contributed to these improvements. The objectives of this initiative are to develop plans and implement measures to reduce the total absorbed dose, and implement activities to decontaminate necessary systems and components to reduce the dose source. The following As Low As Reasonably Achievable (ALARA) accomplishments were realized in 1993:

- An aggressive chemical decontamination plan for Unit 1 Recirc Decon has been developed and successfully completed. This resulted in an estimated dose savings of 450 Person-Rem.

- The cleanup of the Reactor Water Cleanup Phase Separator Room has been completed.

- RHR decontamination connections have been installed.

- An intensive and thorough self-assessment and corrective action program was implemented.

- A number of excellent ALARA program initiatives were completed to reduce person-rem totals. These included the Hot Spot Reduction Program, floor drain cleaning and flushing, chemical decontaminations, and improved shielding packages.

- The Solid Radwaste Program and the associated Transportation Program were effectively implemented.

- The new 10 CFR, Part 20, Standards for Protection Against Radiation, was implemented one year prior to the required implementation date.

- The chemistry program was effectively implemented.

A high level of performance was exhibited in the area of radiation exposure control during 1993. Internal and internal exposures were effectively controlled, work area contamination was effectively controlled and monitored, and ALARA principles were reinforced throughout normal work processes.

Every element of our mission to perform work in a safe, reliable, economic, and environmentally sound manner is impacted by the success of our radiological control programs. The improvements sustained in this initiative will achieve premier radiological control performance.

## NON THREE-YEAR BUSINESS PLAN ACHIEVEMENTS

Improved Brunswick Nuclear Plant Management involvement and control was not limited to those initiatives identified in the Business Plan. The BNP Three-Year Business Plan directed management and personnel focus toward world class performance and provided a plan for achieving this goal. However, many improvements were sustained at BNP as a result of initiatives that were not identified in the BNP Three-Year Business Plan. The following initiatives directly resulted from BNP's commitment to achieve premier performance.

## EMERGENCY PREPAREDNESS IMPROVEMENTS

Significant improvements were realized in the Emergency Preparedness Program in 1993. The following improvements have been made in the Emergency Preparedness area:

- Permanent staff was increased from two to four people.
- A five shift Emergency Response Organization has been implemented.
- A dialogic computer has been installed to automate the notification process for Emergency Response personnel, thus resulting in a shorter response time.
- A "state of the art" siren system has been installed in the 10 mile EPZ.
- An improved self assessment process has been developed utilizing INPO checklist E.P. 801 and NRC Inspection Manuals.
- E.P. specific trend data sheets have been established for enhanced trending of driil deficiencies.
- An INPO assist visit in August 1993 reviewed our hurricane preparedness as it relates to lessons learned from Hurricane Andrew.
- Improved maintenance and testing for the TSC/EOF Emergency Diesel Generator.
- Installed high frequency radio for NRC communications during severe weather.
- Upgraded VHF radio system for state/county communications.
- Installed a decision line telephone which provides conferencing features between our EOF, and state/county decision makers.
- Emergency Lighting has been installed in the TSC/EOF facility.
- Emergency Plan and procedures have been revised to activate the EOF at an ALERT.
- Emergency Preparedness Peer group has established a vision statement that was signed by Vice-President from BNP, HNP, and RNP.
- Aggressive performance indicators have been developed.

The following Emergency Preparedness initiatives have been initiated:

1. Upgrade public/media interface during off-normal and emergency conditions.

   a. Plant media center will be utilized for low-threshold events warranting media attention. This action is scheduled to be completed by 8/30/94.

   b. Joint Information Center (JIC) will be staffed immediately by local CP&L personnel vs. corporate personnel. This action is scheduled to be completed by 12/31/94.

   c. Evaluate relocating JIC facility. This action is scheduled to be completed by 6/1/95.

2. Develop a new emergency action level based on the NUMARC methodology. This initiative is scheduled to be completed by 12/31/94.

3. Develop a non-technical EAL guide for use by state/county personnel. This initiative is scheduled to be completed by 12/31/94.

4. Develop a standard company emergency plan for the three sites (BNP, HNP, and RNP). This should lead to a more consistent approach to Emergency Preparedness, and reduce the manhours presently required for plan maintenance. This initiative is scheduled to be completed by 4/1/95.

5. Improve methods of communicating with field controllers during drills and exercises. This initiative is scheduled to be completed by 6/1/95.

## MAINTENANCE

The following new maintenance initiatives have been initiated:

1. A maintenance forced outage response organization has been established in conjunction with the Work Control Unit and Operations. It provides standardized forced outage work ticket preparation and implementation guidance for the duty maintenance personnel. This minimizes down time by removing the "surprise factor" from the forced outage.

2. A material condition walkdown team comprising of the Duty Manager, Duty Supervisors, and Duty Maintenance Engineers has been established. A material walkdown process and schedule is being developed in accordance with OAI-114, Management Responsibilities for Housekeeping, Schedule and Attributes.

3. The maintenance work ticket backlog has improved significantly as a result of implementing a maintenance work ticket review process. A process has been established to review maintenance work tickets that have been on hold for a long period of time due to engineering concerns. Maintenance and Technical Support engineers review the aged work tickets to determine the validity of the hold status. The average age of these tickets has been reduced by approximately 173.7 days as a result of this process.

4. A significant reduction in the preventive maintenance item backlog has been realized due to the implementation of a preventive maintenance item review process. A preventive maintenance criteria has been established and preventive maintenance items are reviewed against this criteria for dispositioning.

## OPERATIONS

Many performance improvement initiatives were initiated in the area of Operations during 1993-1994 that were in addition to those identified in the BNP Three-Year Business Plan. The following additional initiatives were initiated:

1. A special instant SRO license class was initiated in an effort to more rapidly develop SRO license personnel.

2. The Stop, Think, Act, & Review (STAR) Program was implemented at BNP in an effort to reduce operator errors. This program has proven to be an effective tool by focusing attention on methods for operators to reduce the probability of an operator error. Shift Supervisors reinforce the program elements each day and focus the shift on techniques to avoid errors while performing the planned shift activities.

3. A Load List Project has been initiated to improve performance in the area of recognizing the full impact of removing electrical compartments from service particularly when effecting 120 VAC panels. The Load List Project identifies the plant impacts which result when removing electrical compartments from service including 4160 VAC to 120 VAC. This project is in progress with planned completion by the end of 1994.

4. Operations is initiating a project to improve the format and useability of the Operating Procedures and Abnormal Operating Procedures. A goal of reducing the number of required Abnormal Operating Procedures is included as part of this project scope. The project is scheduled to begin at the completion of the Unit 2 refuel outage.

5. Recent revisions to OI-01, "Operations Principles and Philosophy" have provided various levels of use for procedures depending on the level of difficulty and criticality of evolutions being controlled by the procedure. Level of use categories range from reference use to continuous use with signoffs required for each step. The focal shift is from administrative control to a more balanced focus on operator responsibility and performance.

6. An aggressive program of self assessments has been initiated in Operations. Thirteen self assessments have been planned for 1994 in key Operations areas. The self assessment results will be reported directly to the Section Manager with followup on items requiring corrective action.

7. The Shift Technical Advisor utilization is being reviewed to make the position more productive and useful to shift operations. These personnel represent a valuable and highly trained resource which can contribute more significantly to the success of shift operations.

8. Operations involvement in the planning and conduct of the current Unit 2 refueling outage is more extensive and significant than in past outages. A shift supervisor was assigned for several months prior to the outage to assist in the activity planning and safety reviews. A Shift Outage Manager position has been established during the outage. This position is manned by experienced and previously qualified shift supervising personnel and has significantly contributed to improved Operations focus on outage activities.

9. Preparation for the Unit 2 outage identified a need to investigate the feasibility of conducting on line RHR decontamination. Operations personnel played a key role in the procedure development and scheduling, clearance development, and successful execution of this investigation. This action was a first in the industry and significantly improved the Unit 2 refuel outage preparation process.

10. Responsibility for the Plant Labeling Program has been reassigned to Operations. Significant improvements have been realized in this area due to this reassignment. These improvements include establishing an experienced shift operator to direct the labeling effort. This individual reports directly to the Operations staff. It also includes developing a plan to consolidate the Operator Aids Program and the Labeling Program into a single sitewide program, the use of color and other human factors enhancements to identify dual unit impacting components, and visits to other sites to identify and incorporate best industry practices.

11. The responsibility for maintenance and interpretation of Technical Specifications has shifted from Regulatory Compliance to Operations. This change provides for improved focus and ownership within Operations.

# Brunswick Performance Improvement Initiative

| Title: | Origin: | Number: |
|---|---|---|
| *Corrective Maintenance Backlog Reduction* | *12/92* | *TY103* |

**Strategy:**

To develop and implement management processes for corrective maintenenace backlog to both eliminate the current backlog and maintain manageable levels in the future.

**Impact/Benefits:**

a) Elimination of the current corrective maintenance backlog within three years.

b) Establishment of the optimum staffing levels in the maintenance organization to effectively manage corrective maintenance.

c) Ensure timely repair of plant equipment to sustain good plant material condition.

d) Enhance the corrective maintenance work process allowing effective utilization of manpower.

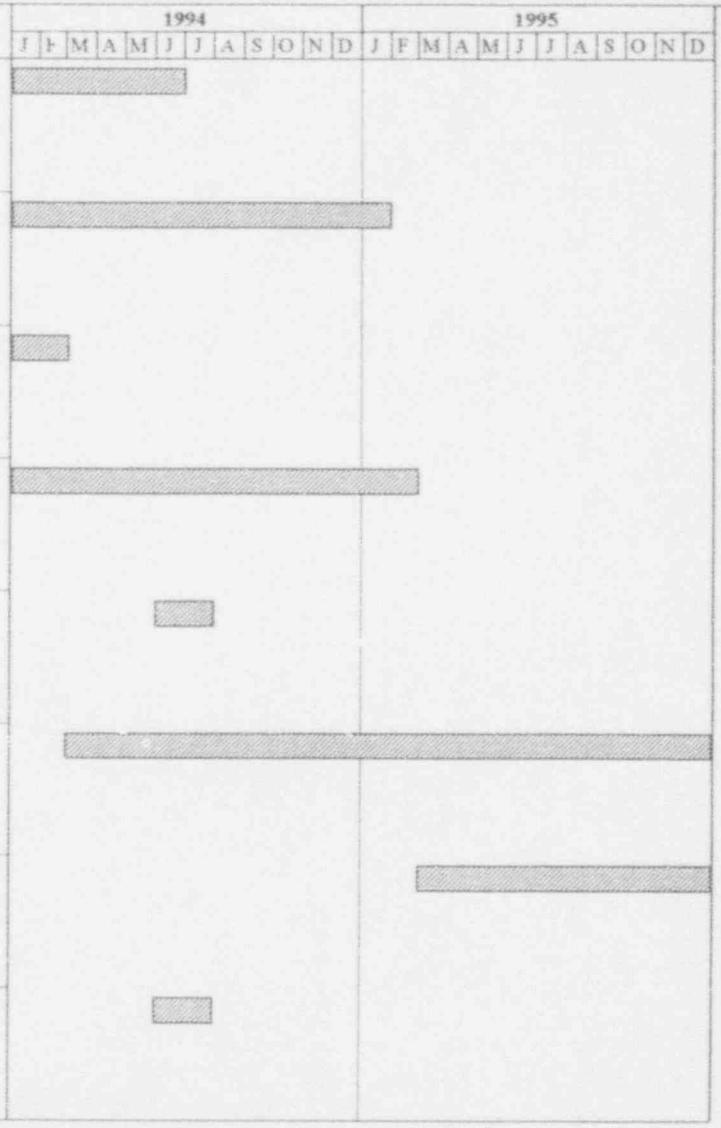
| Sponsor: | Priority: |
|---|---|
| Mike Heffley | Medium |

# Corrective Maintenance Backlog Reduction - TY103

| Description | Action Sponsor | 1994 J F M A M J J A S O N D | 1995 J F M A M J J A S O N D |
|---|---|---|---|
| TY103 - 4B Evaluate and implement improvements to the format, control, and technical content of maintenance procedures. | Mike Heffley | | |
| TY103 - 05A Improve the technical - non-technical format of maintenance procedures. | Mike Heffley | | |

# Corrective Maintenance Backlog Reduction - TY103

| Description | Action Sponsor |
|---|---|
| TY103 - 01E Develop and implement an improved trouble tag/minor maintenance process. | Keith Ahern |
| TY103 - 01F Determine appropriate cycle 9 backlog (WR-JO) reduction goal to be attained by June 1995. | Neal Gannon |
| TY103 - 2A Reduce existing Unit 2 Corrective Maintenance Backlog and achieve goal established by the Unit 2 Plant Manager. | Mike Heffley |
| TY103 - 2B Reduce existing Unit 1 Corrective Maintenance Backlog and achieve goal established by the Unit 1 Plant Manager. | Neal Gannon |
| TY103 -3A Evaluate performance and implement necessary actions for effective corrective backlog management. | Mike Heffley |
| TY103 - 3B Provide necessary staffing to achieve Unit 2 outage corrective maintenance goals per the outage schedule. | Mike Heffley |
| TY103 - 3C Provide necessary staffing to achieve Unit 1 outage corrective maintenance goals per the outage schedule. | Neal Gannon |
| TY103 - 04A Evaluate and implement work process improvements to enhance scheduling and work implementation. | Keith Ahern |






TY103.MPP

# Brunswick Performance Improvement Initiative

| Title: | Origin: | Number: |
|---|---|---|
| *Inventory Control* | *12/92* | *TY105* |

**Strategy:**

To effectively reduce and control the material inventory while supporting plant needs for replacement parts and other material.

**Impact/Benefits:**

a) Ensure accuracy in the storage of material.

b) Improve the cycle inventory process for accuracy in numbers of items stored.

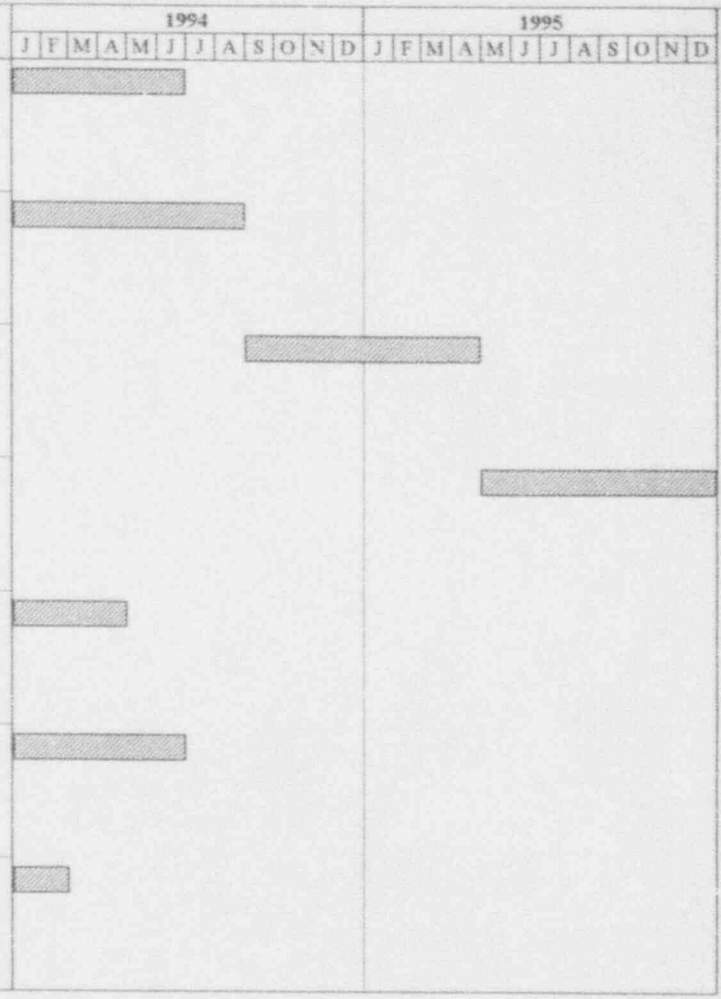
c) Reduce the amount of inventory dollars.

d) Improve automation techniques for inventory control.

| Sponsor: | Priority: |
|---|---|
| John Ferguson | Medium |

# Inventory Control - TY105

| Description | Action Sponsor |
|---|---|
| TY105 - 5A Complete the implementation of the second barcoding segment. | John Ferguson |
| TY105 - 8C Complete the second segment of the 100% inventory. | John Ferguson |
| TY105 - 8D Complete the third segment of the 100% inventory. | John Ferguson |
| TY105 - 8E Complete the final segment of the 100% inventory. | John Ferguson |
| TY105 - 9A Modify procedures for inventory control improvements. | John Ferguson |
| TY105 - 17A Complete evaluation for removing 154 account for tools. | R. White |
| TY105 - 18A Vendor stocking program is implemented for appropriate items (insulation, paint, steel, etc.). | R. Stroud |



# Brunswick Performance Improvement Initiative

| Title: | Origin: | Number: |
|---|---|---|
| *Effective Performance Management* | *12/92* | *TY201* |

**Strategy:**

Improve performance in the areas of safety, production, and cost by effective utilization of human resources. This initiative fully implements Effective Performance Management (EPM) at Brunswick.

**Impact/Benefits:**

a) Clear expectations in support of the mission are established for each employee.

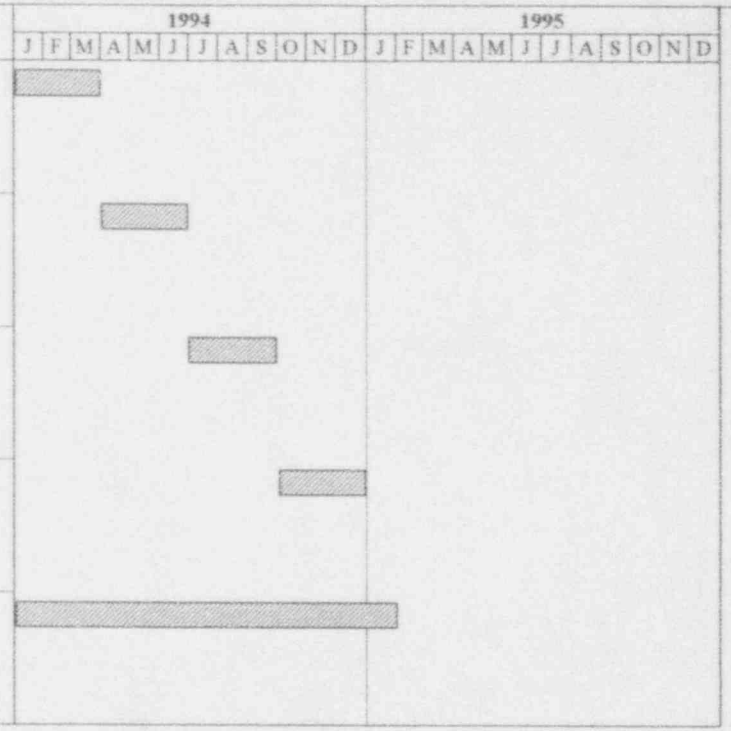
b) The expectations and employee performance are peiodically reviewed to ensure that the expectations support the mission and that performance meets expectations.

c) Employee development plans are developed and reviewed such that each employee may develop to maximum potential.

| Sponsor: | Priority: |
|---|---|
| John Ferguson | High |

# Effective Performance Management - TY201

| Description | Action Sponsor |
|---|---|
| TY201 - 7B Development Plans for Section Managers are complete. | John Ferguson |
| TY201 - 7C Development Plans for Unit Managers are complete. | John Ferguson |
| TY201 - 7D Development Plans for Supervisors are complete. | John Ferguson |
| TY201 - 7E Development Plan for All Employees is complete. | John Ferguson |
| TY201 - 7F Incorporate Development Plan results into Assessment Program. | John Ferguson |



# Brunswick Performance Improvement Initiative

| Title: | Origin: | Number: |
|---|---|---|
| *Training Improvements* | *12/92* | *TY202* |

**Strategy:**

Implement training upgrades that will develop and sustain a highly qualified plant staff by the following:

a) Identifying areas of training weakness.

b) Improving the use of the Systematic Approach to Training.

c) Providing additional training to key personnel.

d) Improved use of industry standards as bases for training programs.

e) Specifically upgrading the following training programs:

Engineering Support
Non-Licensed Operator
Hands-On Craft Personnel

**Impact/Benefits:**

a) Well trained and highly-qualified workforce.

b) Improved individual employee development.

c) Sustaining a high-level of technical qualification for supervisors and managers.

d) An efficient and effective training process.

e) Maintain accreditation of training programs.

f) Assure 100% pass rates on NRC License Exams.

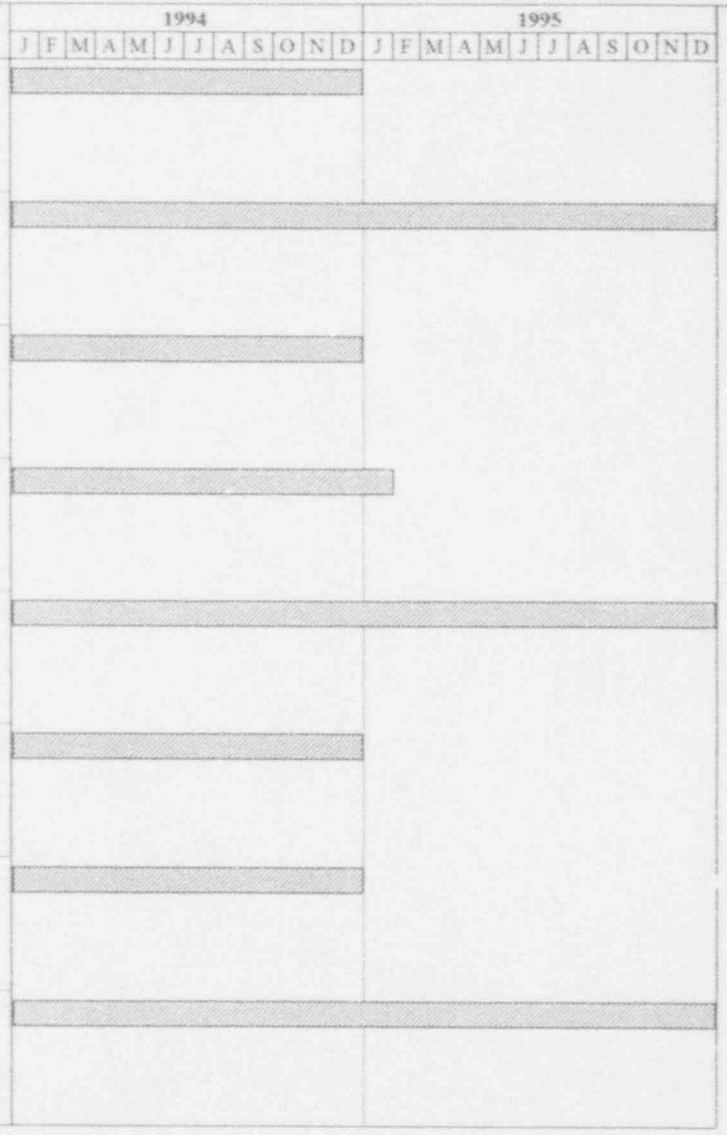
g) Achieve significant improvement in line ownership, involvement, and oversight of training.

h) Significant improvement in the SRO level systems knowledge by supervisors and managers.

| Sponsor: | Priority: |
|---|---|
| Denny Hicks | High |

# Training Improvements - TY202

| Description | Action Sponsor |
|---|---|
| TY202 - 12A Upgrade non-licensed operator training programs for Auxiliary and Radwaste Operators. This includes job and task analysis and development of qualification cards and lesson material. | Mike Williams |
| TY202 - 13I Develop lesson plans and conduct hands-on training for maintenance craft personnel. | Cecil Gurganus |
| TY202 - 14U Develop, validate, and approve Simulator Guides for use during simulator training. | Mike Williams |
| TY202 - 15A Develop and provide performance based Emergency Response Organization initial and refresher training. | Paul Mazzola |
| TY202 - 15Q Develop and provide an Advanced Systems Training Course for managers. | Mike Williams |
| TY202 - 18A Improve the implementation of the Systematic Approach to Training to meet INPO criteria and upgrade job/task analyses and task-to-training matrices for accredited programs. | Denny Hicks |
| TY202 - 33A Conduct staffing and instructor training assessments as described in the Corporate Improvement Initiatives. | Denny Hicks |
| TY202 -34F Develop a prioritized list and procure hands-on training mock-ups and models. | Cecil Gurganus |



# Training Improvements - TY202

| Description | Action Sponsor | 1994 J F M A M J J A S O N D | 1995 J F M A M J J A S O N D |
|---|---|---|---|
| TY202 - 38A Complete the plant simulator upgrade program | Bill Geise | | |

# Brunswick Performance Improvement Initiative

| Title: | Origin: | Number: |
|---|---|---|
| *Management Effectiveness* | *12/92* | *TY204* |

**Strategy:**

Establish a culture in which World-Class performance is the highest priority and where continuous improvement is way-of-life.

**Impact/Benefits:**

a) Organizational structure and staffing aligned to support the vision of World-Class performance.

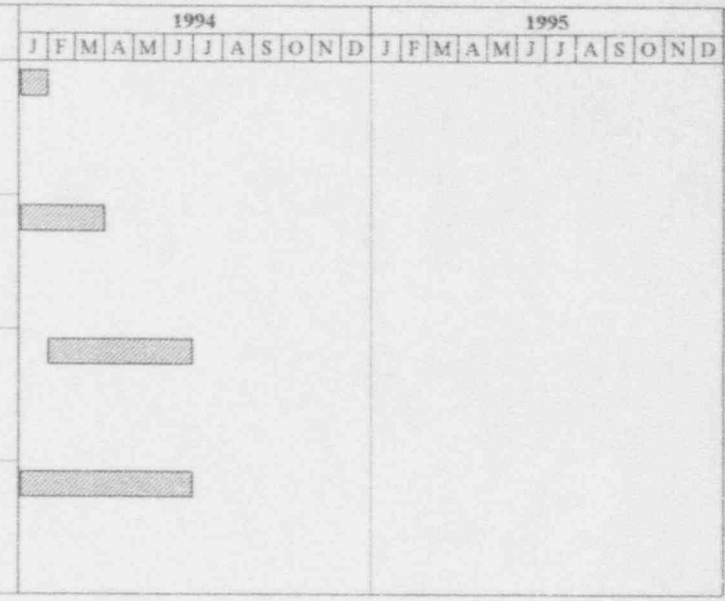
b) Consistent and continuous communication of the new culture and business direction providing the focus for all business activities.

c) Development and execution of a plan for effective use of human resources.

| Sponsor: | Priority: |
|---|---|
| George Warriner | High |

# Management Effectiveness - TY204

| Description | Action Sponsor |
|---|---|
| TY204 - 3A Management and employees will be provided the results of the employee survey. | Galen Jones |
| TY204 - 4A The results of the employee survey will be analyzed and new initiatives will be developed based on the analysis. | George Warriner |
| TY204 - 11A Develop a Human Resource/Organizational Development Plan. | George Warriner |
| TY204 - 12A Managers training will be conducted for the Human Resource/Organizational Development Plan. | Pat Jordan |



# Brunswick Performance Improvement Initiative

| Title: | Origin: | Number: |
|---|---|---|
| *Supervisory and Management Development* | *12/92* | *TY205* |

**Strategy:**

This initiative will implement the following Corporate Improvement Initiatives:

Supervisory Assessment Center
Supervisory Development Program
Management Development and Succession Planning

**Impact/Benefits:**

a) Provide a consistent assessment process to assist in the selection of motivated, high-performing individuals for supervision.

b) Provide supervisory training to incumbent supervisors.

c) Enable the site organization to fill planned and unplanned vacancies with well-prepared supervisors and managers.

| Sponsor: | Priority: |
|---|---|
| Chris Heath | High |

# Supervisory and Management Development - TY205

| Description | Action Sponsor | 1994 J F M A M J J A S O N D | 1995 J F M A M J J A S O N D |
|---|---|---|---|
| TY-205 - 10C High-Potential non-managers will be identified for selected positions. | Bowin Lindgren | | |
| TY-205 - 10D Development plans will be drafted and discussed with high-potential non-managers and supervisors. | Section Managers | | |

# Brunswick Performance Improvement Initiative

| Title: | Origin: | Number: |
|---|---|---|
| *Brunswick Facility Improvements* | *12/92* | *TY206* |

**Strategy:**

Improve the overall condition of Brunswick facilities by:

a) Designing and constructing the following new facilities:

Operations/Maintenance Building
Single Point Access Facility
Technical Training Facility
Snubber Repair and Hot Calibration Shop
Technical and Administrative Cener (TAC Building)
Tool Decontamination Room
Sewage Treatment Plant

b) Upgrading the following facilities:

Main Storeroom HVAC and Power Supply for Hot Shop
CRD Room Upgrade
Control Room Upgrade
Service Building Upgrade
TSC/EOF Building Upgrade

c) Disposing of trailers and temporary buildings.

d) Constructing a Radiation Controlled Area (RCA) with a single-point access.

e) Develop and execute a Master Facilities Plan.

**Impact/Benefits:**

a) Centralize plant organizations and equipment to improve communications, operational effectiveness, and worker efficiency.

b) Improve radioactive material control and streamline plant access.

c) Improve the quality of life of workers.

d) Create a professional industrial site appearance.

e) Upgrade training capabilities.

f) Increase sewage treatment capacity.

g) Provide adequate material storage space.

h) Provide office space in permanent facilities for all CP&L employees.

| Sponsor: | Priority: |
|---|---|
| Roy Johnson | High |

# Brunswick Facility Improvements - TY206

| Description | Action Sponsor | 1994 J F M A M J J A S O N D | 1995 J F M A M J J A S O N D |
|---|---|---|---|
| TY206-2A - Remove Trailers and Temporary Buildings | Bob Deacy | | |
| TY206-11A - Implement the Master Site Factilities Plan | Roy Johnson | | |
| TY206 - 41A Renovate Tool Decontamination Room, Material Storage Facilty, and Administrative Annex. | Bob Deacy | | |

# Brunswick Performance Improvement Initiative

| Title: | Origin: | Number: |
|---|---|---|
| *Nuclear Revision Control System* | *12/92* | *TY207* |

**Strategy:**

Implement the Nuclear Revision Control System (NRCS) to maintain the current status of documents and media required to operate, maintain, design, or otherwise support plant operations.

**Impact/Benefits:**

a) Effective utilization of manpower by providing a user-friendly method to determine the revision status of plant documents.

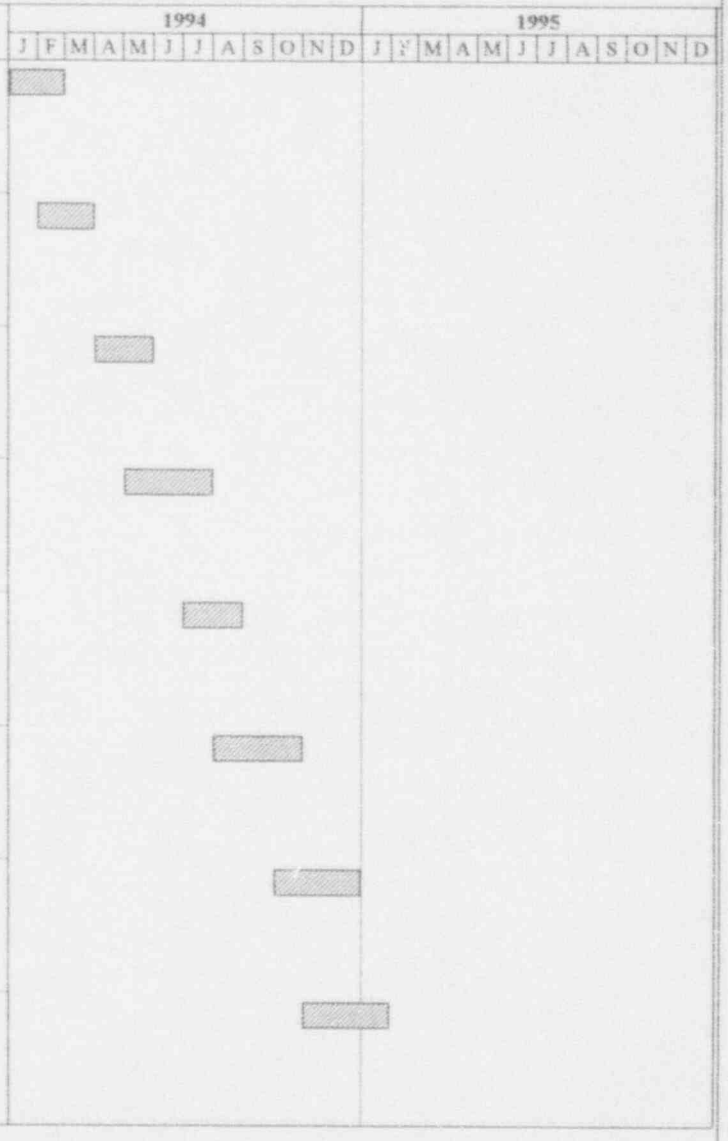
b) Improved communication between site organizations.

c) High-confidence in the accuracy of the NRCS will streamline operations, maintenance, engineering, and other support activities.

| Sponsor: | Priority: |
|---|---|
| Carol Lewis | Medium |

# Nuclear Revision Control System - TY207

| Action Step | Action Sponsor |
|---|---|
| TY207 - 2A Conduct an assessment of the NRCS to determine the current status of the system, including daily usage and status of existing data. | Carol Lewis |
| TY207 - 3A Define the desired specific function and purpose of NRCS. | Carol Lewis |
| TY207 - 4A Develop action plan based on assessment results and desired function and purpose. | Carol Lewis |
| TY207 - 5A Develop and approve an NRCS governing procedure. | Carol Lewis |
| TY207 - 6A Evaluate existing NRCS application software and identify necessary upgrades. | Don Reid |
| TY207 - 7A Implement application software upgrades. | Don Reid |
| TY207 - 8A Develop NRCS data entry profiles. | Carol Lewis |
| TY207 - 9A Implementing procedures will be developed and training conducted. | Carol Lewis |



# Brunswick Performance Improvement Initiative

| Title: | Origin: | Number: |
|---|---|---|
| *Improved Procedure Control and Content* | *12/92* | *TY301* |

**Strategy:**

Develop and implement a comprehensive procedure control process to more efficiently manage Plant Operating Manual procedures by establishing a hierarchy and an efficient change process to improve plant procedures.

**Impact/Benefits:**

a) A uniform process for the development, change, and overall control of Plant Operating Manual procedures.

b) An efficient process for executing expedient changes to incorrect or inadequate procedures, thereby stimulating identification of problems and encouraging procedural adherence.

| Sponsor: | Priority: |
|---|---|
| Carol Lewis | Medium |

# Improved Procedure Control Process - TY301

| Action Step | Action Sponsor | 1994 J F M A M J J A S O N D | 1995 J F M A M J J A S O N D |
|---|---|---|---|
| TY301 - 10A Full implementation of the new procedure control process. | Carol Lewis | | |

# Brunswick Performance Improvement Initiative

| Title: | Origin: | Number: |
|---|---|---|
| *Improving the Modification Process* | *12/92* | *TY302* |

**Strategy:**

Improve the plant modification process to reduce the overall investment of both human and financial resources and to provide timely response for needed modifications.

**Impact/Benefits:**

a) Improved efficiency in resource utilization for design activities to ultimately result in a 25% design cost reduction.

b) Reduced design time for small modifications and setpoint changes to less than 6 weeks and less than 3 weeks, respectively.

| Sponsor: | Priority: |
|---|---|
| Chip Pardee | High |

# Improving the Modification Process - TY302

| Description | Action Sponsor | 1994 J F M A M J J A S O N D | 1995 J F M A M J J A S O N D |
|---|---|---|---|
| TY302 - 6E Complete orientation training for incumbent engineers involved in the design process. | Eric Northeim | | |
| TY302 - 6F Complete position specific training for incumbent engineers involved in the design process. | Eric Northeim | | |

# Brunswick Performance Improvement Initiative

| Title: | Origin: | Number: |
|---|---|---|
| *Improved Ability to Identify and Correct Problems* | *12/92* | *TY303* |

**Strategy:**

Develop and implement a self-assessment program that results in critical evaluation of plant processes and products.

Develop and implement a root cause analysis process strengthened by improved training, line organization involvement, increased management oversight, and feedback from the Operations Experience Feedback Program.

Improve the Corrective Action Program by improving training, establishment of effective sub-programs, and implementation of effective trending and tracking.

**Impact/Benefits:**

a) An established culture of continuous improvement.

b) Clear and consistent management direction enforcing the expectation for effective self-assessment and the accountability for effective corrective action.

c) Early identification of problems, by responding to precursor events and findings identified through self-assessment.

d) Management attention focussed on areas needing improvement.

e) Accurate identification of the root causes of problem areas.

f) Decreased number of plant events and violations.

g) Effective application of lessons learned at other plants, worldwide.

| Sponsor: | Priority: |
|---|---|
| Rich Lopriore | High |

# Improve Ability to Identify and Correct Problems - TY303

| Description | Action Sponsor | 1994 J F M A M J J A S O N D | 1995 J F M A M J J A S O N D |
|---|---|---|---|
| TY303 - 1H Perform a self-assessment on the effectiveness of the self-assessment program. | Rich Lopriore | | |
| TY303 - 1J Perform a self-assessment based on the results of the 1993 SALP Report. | Rich Lopriore | | |
| TY303 - 3I Perform semi-annual self-assessments of Corrective Action Management and Root Cause Analysis Programs | Rich Lopriore | | |



TY303.MPP

# Brunswick Performance Improvement Initiative

| Title: | Origin: | Number: |
|---|---|---|
| *Clearance Process Improvements* | *12/92* | *TY305* |

**Strategy:**

Evaluate the current clearance process against the best practices at world-class plants. Develop and implement improvements to maintain protection for both personnel and equipment and to streamline the clearance process.

**Impact/Benefits:**

a) Improved margins of personnel and equipment safety through the use of a well understood and practiced clearance process.

b) Increased efficiency of the work management process through the use of an effective and streamlined clearance process.

c) Clear definition of the authority for equipment manipulation.

d) Improved utilization of manpower through the planning and use of master clearances.

| Sponsor: | Priority: |
|---|---|
| John Titrington | High |

# Clearance Process Improvements - TY305

| Description | Action Sponsor | 1994 J F M A M J J A S O N D | 1995 J F M A M J J A S O N D |
|---|---|---|---|
| TY305 - 1A Implement necessary procedure changes resulting from the team evaluation of clearance process improvements. | John Titrington | | |
| TY305 - 2A Complete necessary training on the improved clearance process and implementing procedures. | John Titrington | | |

## Brunswick Performance Improvement Initiative

| Title: | Origin: | Number: |
|---|---|---|
| *Centralized Document Control Program* | *12/92* | *TY308* |

**Strategy:**

Evaluate the current document control process against the needs of the plant. Develop an improved program, train personnel, and implement the improved program.

**Impact/Benefits:**

a) High confidence that superceded revisions to documents are not used to operate or maintain the plant.

b) Improved efficiency in the work management process.

c) Complete and strict management of controlled documents by a central organization.

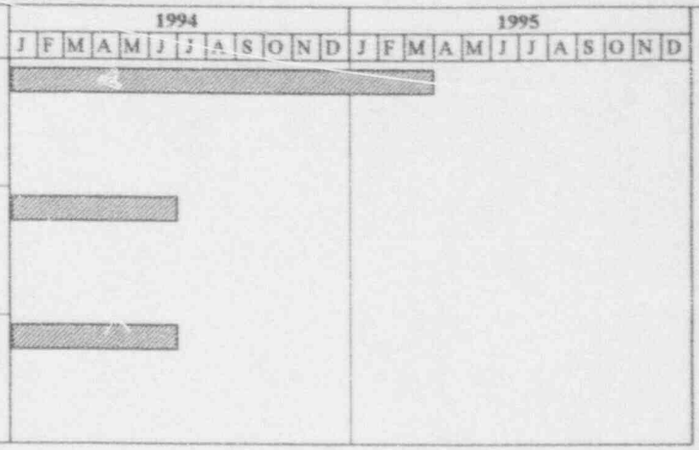
d) Effective management of document libraries with clear and understandable rules for their use.

e) Continued improvement through the use of an internal audit program.

| Sponsor: | Priority: |
|---|---|
| Carol Lewis | Medium |

# Centralized Document Control Program - TY308

| Description | Action Sponsor |
|---|---|
| TY308 - 1B Evaluate drawing control, procedure control, vendor manual control, and mod package control areas of the document control program. | Carol Lewis |
| TY308 - 6A Adequately train site personnel in the use of the document control training program. | Carol Lewis |
| TY308 - 7A Fully implement the improved document control procedures. | Carol Lewis |



# Brunswick Performance Improvement Initiative

| Title: | Origin: | Number: |
|---|---|---|
| *Preventive and Predictive Maintenance Program Improvements* | *12/92* | *TY501* |

**Strategy:**

Evaluate our programs against best practices at world-class plants. Reconstruct the bases for Preventive Maintenance tasks and frequencies and ensure that the work we perform effectively supports the mission.

Develop and implement a Predictive Maintenance Program to proactively evaluate equipment conditions through the use of infrared thermography, and vibration analysis.

**Impact/Benefits:**

a) An optimized Preventive Maintenance Program which performs the right work at the correct time to improve equipment performance and reliability.

b) Reduced overall maintenance costs by eliminating redundant tasks or those tasks which add no value.

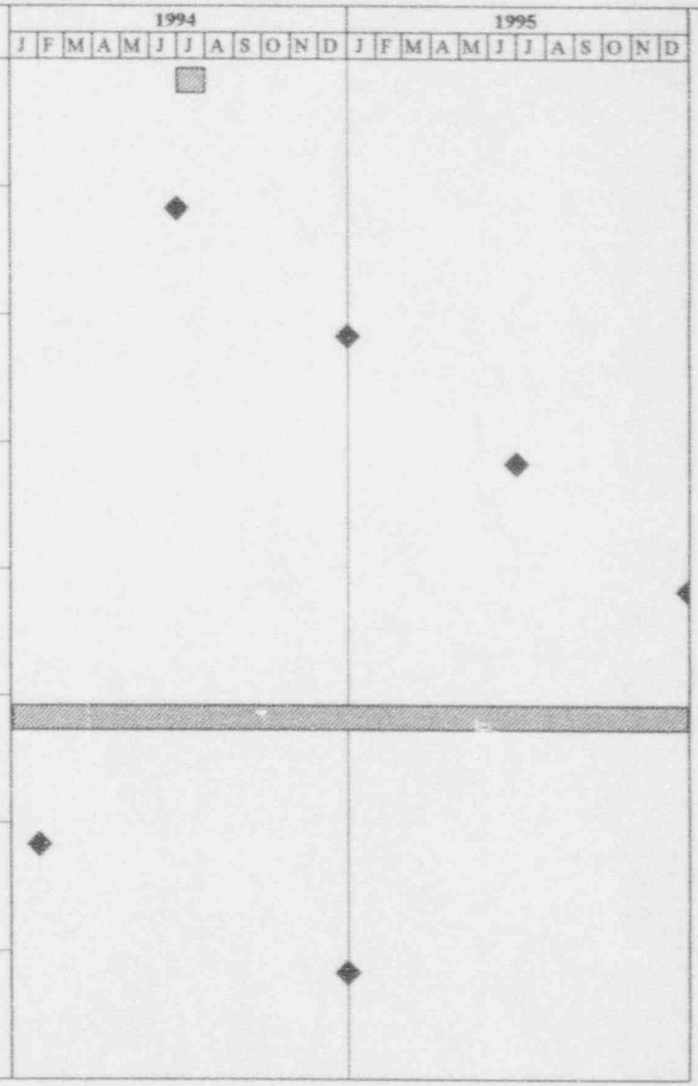
c) Reduced challenges to operation by providing more reliable plant equipment.

d) Provide consistent and trended data for use in Preventive and Predictive Maintenance Programs.

| Sponsor: | Priority: |
|---|---|
| Chip Pardee | High |

# Preventive/Predictive Maintenance Program Improvements - TY501

| Description | Action Sponsor |
|---|---|
| TY501 - 2B Complete a self-assessment of the Preventive Maintenance optimization process. | Mark Varno |
| TY501 - 4C Complete optimization of 5 total prioritized systems. | Mark Varno |
| TY501 - 4D Complete optimization of 14 total prioritized systems. | Mark Varno |
| TY501 - 4E Complete optimization of 20 total prioritized systems. | Mark Varno |
| TY501 - 4F Complete optimization of 26 total prioritized systems. | Mark Varno |
| TY501 - 5A Incorporate optimized PM tasks into existing PM program (e.g. procedures). | Mark Varno |
| TY501 - 5B Incorporate optimized PM tasks into existing program - 2 pilot systems. | Mark Varno |
| TY501 - 5C Incorporate optimized PM tasks into existing program for 6 more systems (8 to date). | Mark Varno |

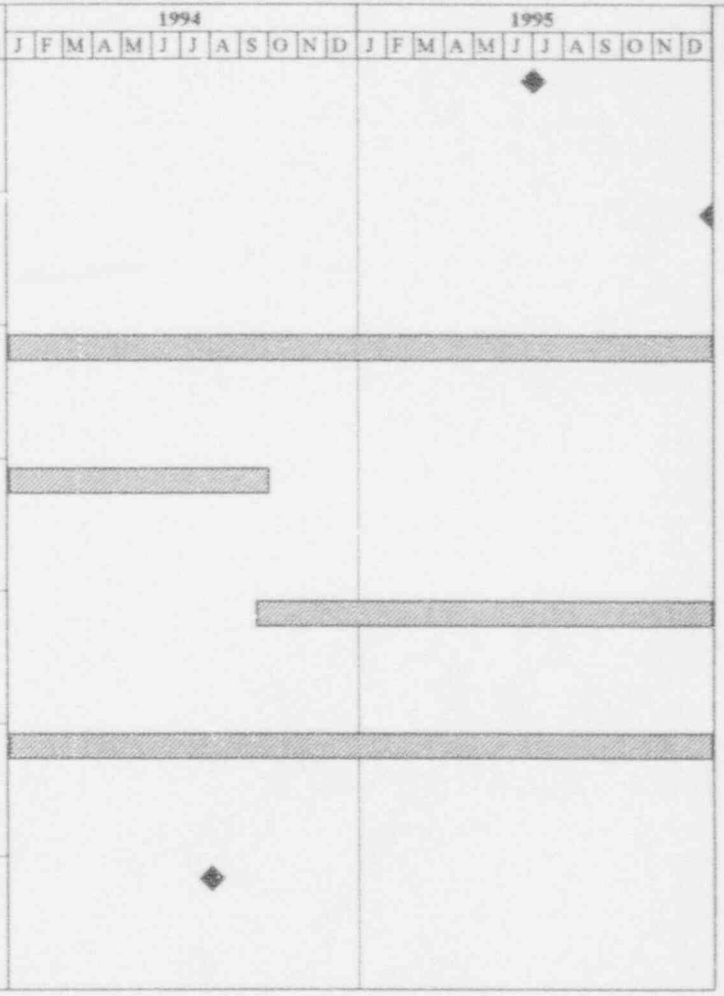





TY501.MPP

# Preventive/Predictive Maintenance Program Improvements - TY501

| Description | Action Sponsor |
|---|---|
| TY501 - 5D Incorporate Optimized PM tasks into existing program for 6 more systems (14 to date). | Mark Varno |
| TY501 - 5E Incorporate optimized PM tasks into existing program for 6 more systems (20 to date). | Mark Varno |
| TY501 - 6A Develop Predictive Maintenance Program. | Mark Varno |
| TY501 - 6F Implement Predictive Maintenance Program self-assessment action plan. | Mark Varno |
| TY501 - 6G Integrate Preventive and Predictive Maintenance Programs to create Predictive-Driven Preventive Maintenance tasks. | Mark Varno |
| TY501 - 7A Maintenance PM procedure revisions and planning. | Mark Varno |
| TY501 - 7B 5 Systems PM procedure/route revisions completed. | Mark Varno |



# Brunswick Performance Improvement Initiative

| Title: | Origin: | Number: |
|---|---|---|
| *Corrosion Preventive Maintenance* | *12/92* | *TY502* |

**Strategy:**

Evaluate the best practices at world-class plants. Develop and implement a program which will prevent declining material condition resulting from corrosion.

**Impact/Benefits:**

Plant equipment material condition will be preserved by replacing or properly preserving components with proper coatings.

| Sponsor: | Priority: |
|---|---|
| Chip Pardee | High |

# Corrosion Preventive Maintenance - TY502

| Description | Action Sponsor | 1994 J F M A M J J A S O N D | 1995 J F M A M J J A S O N D |
|---|---|---|---|
| TY502 - 1A Develop and implement a Corrosion Preventive Maintenance Program to maintain plant material condition from the effects of corrosion. | Ken Fennell | | |
| Provide engineering support for cleaning and inspection of storm drains: prepare study based on results. | Hal Pitts | | |

# Brunswick Performance Improvement Initiative

| Title: | Origin: | Number: |
|---|---|---|
| *Cooling Water Reliability Program* | *12/92* | *TY505* |

**Strategy:**

Evaluate the best practices at world-class plants. Develop and implement a program which will preserve cooling water systems from the effects of erosion and corrosion. Systems to be included are: the Circulating Water System, the Reactor Building Closed Cooling Water System, the Turbine Building Closed Cooling Water System, and the Service Water System.

**Impact/Benefits:**

a) Reduced potential for through-wall leaks resulting from erosion or corrosion.

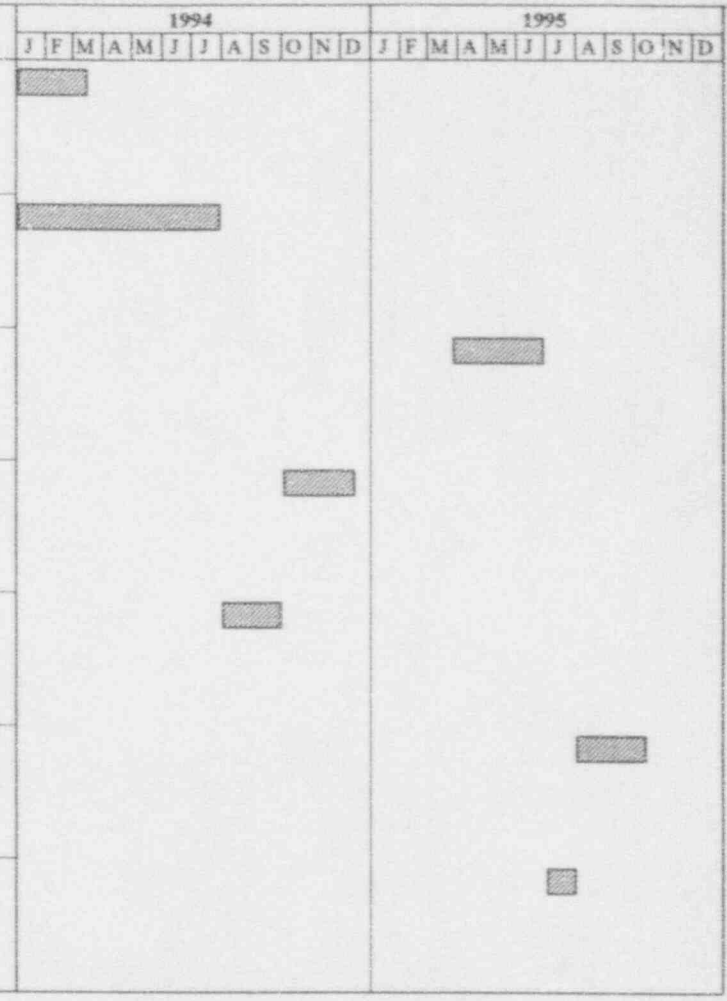
b) Improved cooling water system material condition.

c) Long-term reliability and lesser maintenance costs.

| Sponsor: | Priority: |
|---|---|
| Chip Pardee | High |

# Cooling Water Reliability Program - TY505

| Description | Action Sponsor |
|---|---|
| TY505 - 2B Develop a written procedure to define the program at BNP. | Ken Fennell |
| TY505 - 3A Determine the scope of piping to be included in the program for U1 cooling water systems. | Ken Fennell |
| TY505 - 3B Implement corrective actions as detemined by the inspections of Unit 1 cooling water systems | Don Eng |
| TY505 - 3C Complete design of corrective actions and provide engineering support during implementation of corrective actions from Unit 1 cooling water system inspections. | Bob Grazio |
| TY505 - 3E Perform ultrasonic testing (baseline) of identified piping for Unit 1 cooling water systems. | John Langdon |
| TY505 - 4C Complete design of corrective actions and provide engineering support during implementation of corrective actions from Unit 2 cooling water system inspections. | Bob Grazio |
| TY505 - 4E Perform ultrasonic testing (baseline) of identified piping for Unit 2 cooling water systems. | John Langdon |






TY505.MPP

# Brunswick Performance Improvement Initiative

| Title: | Origin: | Number: |
|---|---|---|
| *Plant Engineering Program Upgrade* | *12/92* | *TY506* |

**Strategy:**

Evaluate best practices at world-class plants and develop and implement a program to upgrade Plant Engineering based on these best practices and the intent of INPO Good Practice TS-413, Use of System Engineers.

**Impact/Benefits:**

a) Improved performance and reliability of systems and equipment.

b) Improved Plant Engineering performance in the areas of material condition, outage management, and management of engineering backlogs.

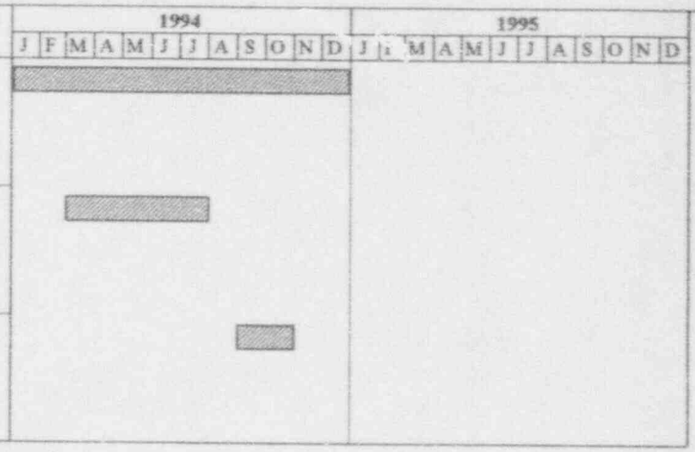
c) Increased job satisfaction through increased responsibility, accountability, and technical knowledge.

d) Improved technical knowledge/experience of systems engineers, thereby broadening the capabilities and flexibility of engineering personnel.

| Sponsor: | Priority: |
|---|---|
| Chip Pardee | High |

# Plant Engineering Program Upgrade - TY506

| Description | Action Sponsor |
|---|---|
| TY506 - 9A Sustain specific interim contractor assignments in needed engineering program areas while minimizing the need for continuing contractor support. | Chip Pardee |
| TY506 - 17A Incorporate lessons learned from the Technical Support Improvement Program into Nuclear Engineering Department. | Chip Pardee |
| TY506 - 18A Perform a self-assessment of the effectiveness of improvements in Plant Engineering (Technical Support and NED). | Chip Pardee |



# Brunswick Performance Improvement Initiative

| Title: | Origin: | Number: |
|---|---|---|
| *Inservice Inspection and Inservice Testing Improvement Program* | *12/92* | *TY507* |

**Strategy:**

Evaluate best practices at world-class plants and develop and implement a program to upgrade the Inservice Inspection (ISI) and Inservice Testing (IST) Programs. Evaluate needs and implement necessary improvements in training, test equipment, and system configuration to support this upgrade.

**Impact/Benefits:**

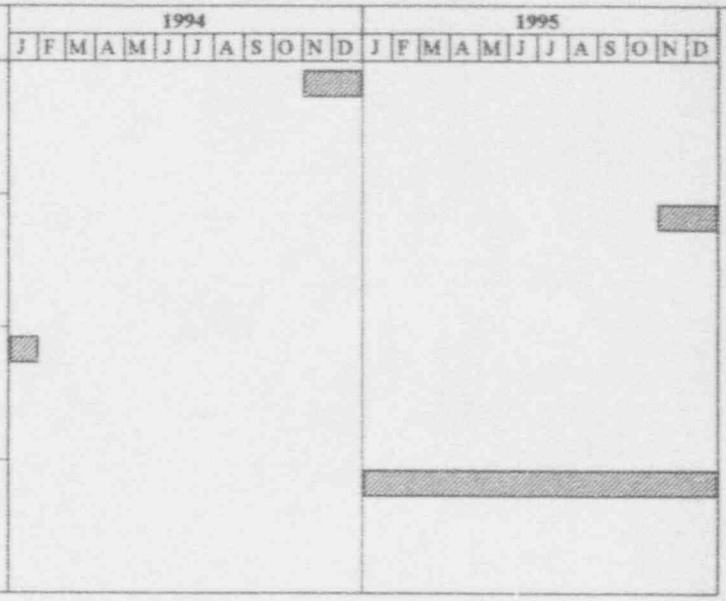
a) High-confidence of compliance with ASME Section XI and 10CFR50 requirements.

b) Improved efficiency of ISI/IST activities thereby eliminating unnecessary resources, radiation exposure, and costs.

| Sponsor: | Priority: |
|---|---|
| Chip Pardee | High |

# Inservice Inspection and Inservice Testing Improvement Program - TY507

| Description | Action Sponsor |
|---|---|
| TY507 - 1B Perform a self-assessment of ISI/IST improvements and develop a plan for corrective actions. | Jerry Crider |
| TY507 - 1C Perform a self-assessment of ISI/IST improvements and develop a plan for corrective actions. | Jerry Crider |
| TY507 - 3A Review/revise ISI/IST program implementing test procedures. | Jerry Crider |
| TY507 - 12A Update the ISI/IST programs for the third interval using the latest edition of the code. | Jerry Crider |



# Brunswick Performance Improvement Initiative

| Title: | Origin: | Number: |
|---|---|---|
| *Painting to Upgrade Material Condition* | *12/92* | *TY510* |

**Strategy:**

Develop and implement a program to upgrade the material condition of the plant by coating floors, walls, ceilings, and equipment. A system and unit separation color coding scheme should be included. Note: Protective coating of inaccessible or near inaccessible areas will be reviewed by management on a room by room basis.

**Impact/Benefits:**

a) Higher standards of material condition.

b) A professional plant environment promoting performance excellence.

c) Fewer errors resulting from wrong system/wrong unit mistakes.

| Sponsor: | Priority: |
|---|---|
| Bob Deacy | Medium |

# Painting to Upgrade Material Condition - TY510

| Description | Action Sponsor | 1994 J F M A M J J A S O N D | 1995 J F M A M J J A S O N D |
|---|---|---|---|
| TY510 - 3A Implement the Five-Year Painting Plan | Bob Deacy | | |

# Brunswick Performance Improvement Initiative

| Title: | Origin: | Number: |
|---|---|---|
| *Dose Reduction* | *12/92* | *TY511* |

**Strategy:**

Develop plans and implement measures to reduce the total absorbed dose. Implement activities to decontaminate necessary systems and components to reduce the dose source.

**Impact/Benefits:**

a) Reduced site exposure to world-class levels of less than 500 person-REM, annually.

b) Reduced dose from plant systems and equipment through chemical decontamination and hydrolasing to reduce contamination levels.

| Sponsor: | Priority: |
|---|---|
| Carlton Robertson | Medium |

# Dose Reduction - TY511

| Action Step | Action Sponsor | 1994 J F M A M J J A S O N D | 1995 J F M A M J J A S O N D |
|---|---|---|---|
| TY511 - 1C Develop and implement a Chemical Decontamination Plan for Unit 2 Residual Heat Removal and Reactor Recirculation Systems. | Carlton Robertson | | |
| TY511 - 1I Develop and implement a Chemical Decontamination Plan for Unit 1 Reactor Recirculation System. | Carlton Robertson | | |

## Brunswick Performance Improvement Initiative

| Title: | Origin: | Number: |
|---|---|---|
| *Environmental and Chemistry Program Improvements* | *12/92* | *TY512* |

**Strategy:**

Evaluate best practices at world-class plants. Develop plans and implement measures to upgrade our existing programs.

**Impact/Benefits:**

a) Optimum chemistry is maintained in plant systems and equipment ensuring long-term plant life.

b) Discharges to the environment are minimized and world-class performance parameters are achieved.

| Sponsor: | Priority: |
|---|---|
| Carlton Robertson | Medium |

# Environmental and Chemistry Program Improvements - TY512

| Description | Action Sponsor | 1994 J F M A M J J A S O N D | 1995 J F M A M J J A S O N D |
|---|---|---|---|
| TY512 - 4A Develop and implement a program to reduce liquid radwaste. | Carlton Robertson | | |

| PROJECTS LISTING | |
|---|---|
| **PROJECT#** | **PROJECT TITLE** |
| | HVAC UPGRADE (FAIM #A0001666) |
| | SIMULATOR CORE THERMAL UPGRADE (FAIM #10000454) |
| | SIMULATOR INSTRUCTOR STATION (FAIM #10000453) |
| | UNIT 1 & 2 ROTOR REPLACEMENT (FAIM #10000621) |
| 00912A | UPGRADE REPLACEMENT EQUIPMENT TO NUREG 0588, CAT I REQUIREMENTS |
| 00912D | ROSEMOUNT TRANSMITTER REPLACEMENT |
| 00917I | EMERGENCY RESPONSE FACILITY ISOLATION SIGNAL - GROUP 10 |
| 00918A | REACTOR VESSEL WATER LEVEL INSTRUMENTATION UPGRADE |
| 00925A | REMOTE SHUTDOWN PANEL LEVEL INDICATION |
| 00925F | APPENDIX R, THERMOLAG FIRE WRAP ISSUE |
| 01538A | SERVICE WATER SYSTEM PIPING PHASE III |
| 01757A | PROCESS COMPUTER REPLACEMENT |
| 02317A | REPLACE SHAFT DRIVEN OIL PUMP FOR REACTOR FEEDPUMP TURBINE WITH MOTOR DRIVEN PUMP(S) |
| 02549A | SCREENWASH PUMP UPGRADE |
| 03484A | HPCI ROOM C02 SYSTEM ALARM |
| 04031A | RESIDUAL HEAT REMOVAL HEAD SPRAY REMOVAL |
| 04042A | SEISMIC QUALIFICATION OF EQUIPMENT-NUREG 1030 |
| 04688A | FEEDWATER CONTROL SYSTEM REPLACEMENT |
| 04830A | MAINTAIN THE BSEP ENVIRONMENTAL QUALIFICATION PROGRAM |
| 04963A | REACTOR WATER CLEAN UP PUMP |
| 05092A | REACTOR BUILDING INSTRUMENT RACK REPAIR/UPGRADE |
| 05307A | DC BATTERY LOAD STUDY |
| 05429A | CONDENSATE WATER BOX AIR REMOVAL |
| 05644A | AC VOLTAGE DROP ANALYSIS |
| 05806A | RADWASTE EFFLUENT RELEASE LINE REPLACEMENT |
| 05892A | EFFECT OF ELECTRICAL SYSTEM VARIATIONS ON TURBINE GENERATOR TORSIONAL RESPONSE |
| 05983A | BATTERY ROOM HVAC |
| 06156A | HIGH PRESSURE COOLANT INJECTION-REACTOR CORE ISOLATION COOLING HI-STEAM FLOW |

| PROJECTS LISTING | |
|---|---|
| **PROJECT#** | **PROJECT TITLE** |
| 06202A | OFF-GAS DRAIN TANKS RESERVOIR |
| 06249A | DIESEL GENERATOR START & CONTROL AIR MOISTURE REMOVAL |
| 06650A | REACTOR PRESSURE VESSEL THERMAL CYCLING EVALUATION |
| 06661A | TRANSVERSE IN-CORE PROBE SYSTEM |
| 06729A | DREDGE SPOILS DISPOSAL |
| 07148A | REPLACE HPCI, RCIC AND RPS TOPAZ INVERTERS |
| 07208A | REMOVE/REPLACE OBSOLETE BAILEY RECORDERS |
| 07438A | REPLACEMENT OF OFF-GAS RADIATION MONITORING RECORDERS |
| 07848A | REACTOR BUILDING ROOF VENT |
| 07862A | REPLACE LIGHTING AND COMMUNICATIONS UNINTERRUPTIBLE POWER SUPPLY |
| 08262A | DRYWELL COOLERS LOSS OF COOLING ACCIDENT LOCKOUT OVERRIDE |
| 08341A | RPV SHELL TEMPERATURE MONITORING THERMOCOUPLE CABLE REPLACEMENT |
| 12420A | CONTROL BLDG HVAC CONDENSATE DRAIN REPAIR |
| 12984C | JET PUMP BEAM REPLACEMENT |
| 31856B | FIRE BARRIER UPGRADE |
| 80203A | DIESEL GENERATOR FUEL OIL LEVEL |
| 81401A | FLOOR DRAIN FILTER RETROFIT |
| 84489B | 480-AC MOTOR PROTECTION MODIFICATION |
| 84587A | RADWASTE SAMPLING SYSTEM UPGRADE |
| B0014A | EMERGENT STRUCTURAL ISSUES |
| B0018A | PIPING DESIGN TURNOVER PROGRAM |
| B0019A | DESIGN BASIS RECONSTITUTION |
| BNT622 | BNP PLANT BUILDING STEEL |
| F0025C | EQUIPMENT DATABASE SYSTEM |
| G0010A | REPLACE E11-F003A-B & F0024A-B WITH GLOBE VALVES |
| G0015A | SMALL MODS |
| G0017A | DC VOLTAGE PROFILE STUDY |
| G0024A | INVESSEL CORE SPRAY PIPING REPAIR |
| G0029A | FEEDWATER SPARGER CRACKING ISSUE |

| PROJECTS LISTING | |
|---|---|
| **PROJECT#** | **PROJECT TITLE** |
| G0050A | SERVICE WATER TASK |
| G0050J | DIESEL GENERATOR SERVICE WATER SUPPLY AND DISCHARGE PIPING REPLACEMENT |
| G0051A | SECONDARY CONTAINMENT ATMOSPHERIC MONITOR MODULES AND STEAM LEAK DETECTION SYSTEM UPGRADE |
| G0058A | TURBINE UPRATE |
| G0075A | LOCAL POWER RANGE MONITOR CABLE REPLACEMENT IN DRYWELL |
| G0083A | INSTRUMENT AIR COMPRESSORS ALARM AND AIR PRESSURE SETPOINTS |
| G0096A | FUEL POOL GIRDER TENDON INSERVICE INSPECTION |
| G0105A | BWR THERMAL HYDRAULIC STABILITY ISSUE |
| G0110A | ELECTRICAL DISTRIBUTION ADEQUACY/GDC-17 |
| G0140A | UPGRADE SECURITY COMPUTER AND CARD READER |
| G0156A | PROVIDE CAD SUBSYSTEM DIVISIONAL SEPARATION |
| G0159A | REMOVAL AND ANALYSIS OF RPV INVESSEL IRRADIATION SPECIMENS |
| G0161A | BUS DUCT COOLING FAN MODIFICATION |
| G0180A | 125/250 VDC BATTERY GROUND DETECTION IMPROVEMENTS |
| G0193A | REFRIGERANT REPLACEMENT UNIT 1 & UNIT 2 |
| G0218A | MAKE TEMPORARY POWER FEEDS PERMANENT |
| G0237A | REACTOR WATER LEVEL REFERENCE LEG CONTINUOUS BACKFILL |
| G0249A | TORUS LINER PRESERVATION |
| G0250A | REACTOR VESSEL CORE SHROUD MODIFICATION |
| G0251A | HYDROGEN WATER CHEMISTRY |
| M0066A | REFUEL BRIDGE UPGRADE |
| M0121E | PROVIDE THERMAL OVERLOAD PROTECTION FOR AC MOTOR OPERATED VALVES |
| P0057B | SERVICE WATER AND CIRCULATING WATER INTAKE AREA ENHANCEMENT |
| P0057E | HOTSIDE-COLDSIDE WALKDOWN REPAIRS |
| R0123A | CHEMICAL DECON |
| R0123M | SPENT FUEL POOL COOLING ASSIST-PIPING & PENETRATIONS |
| S0033B | CONTROL ROOM UPGRADE |

# PROJECT CATEGORIZATION

## Category I - Commitments

Represents projects that are necessary to comply with an explicit written obligation to a regulatory agency and any implicit actions resulting from these obligations. Changes to Category I projects will be approved by the Vice President, BNP in accordance with PLP-26, "Establishment of Commitments to Regulatory Agencies."

## Category II - Non-Commitments

Represents other business related projects/modifications. Changes to Category II projects will be approved in accordance with the Nuclear Generation Group Manual, 303-05, Three Phase Project Approval and Authorization Process.

| CATEGORY I & II PROJECTS LISTING | | |
|---|---|---|
| PID NUMBER | PROJECT TITLE | COMMITMENT CATEGORY |
| 00912A | UPGRADE REPLACEMENT EQUIPMENT TO NUREG 0588, CAT I REQUIREMENTS | I |
| 00912D | ROSEMOUNT TRANSMITTER REPLACEMENT | I |
| 00917I | EMERGENCY RESPONSE FACILITY ISOLATION SIGNAL - GROUP 10 | I |
| 00918A | REACTOR VESSEL WATER LEVEL INSTRUMENTATION UPGRADE | I |
| 00925A | REMOTE SHUTDOWN PANEL LEVEL INDICATION | I |
| 00925F | APPENDIX R, THERMOLAG FIRE WRAP ISSUE | I |
| 01538A | SERVICE WATER SYSTEM PIPING PHASE III | I |
| 04042A | SEISMIC QUALIFICATION OF EQUIPMENT-NUREG 1030 | I |
| 05092A | REACTOR BUILDING INSTRUMENT RACK REPAIR/UPGRADE | I |
| 05644A | AC VOLTAGE DROP ANALYSIS | I |
| 06156A | HIGH PRESSURE COOLANT INJECTION-REACTOR CORE ISOLATION COOLING HI-STEAM FLOW | I |
| 06249A | DIESEL GENERATOR START & CONTROL AIR MOISTURE REMOVAL | I |
| B0014A | EMERGENT STRUCTURAL ISSUES | I |
| B0018A | PIPING DESIGN TURNOVER PROGRAM | I |
| B0019A | DESIGN BASIS RECONSTITUTION | I |
| BNT622 | BNP PLANT BUILDING STEEL | I |
| G0010A | REPLACE E11-F003A-B & F0024A-B WITH GLOBE VALVES | I |
| G0017A | DC VOLTAGE PROFILE STUDY | I |
| G0024A | INVESSEL CORE SPRAY PIPING REPAIR | I |
| G0029A | FEEDWATER SPARGER CRACKING ISSUE | I |
| G0050J | DIESEL GENERATOR SERVICE WATER SUPPLY AND DISCHARGE PIPING REPLACEMENT | I |
| G0051A | SECONDARY CONTAINMENT ATMOSPHERIC MONITOR MODULES AND STEAM LEAK DETECTION SYSTEM UPGRADE | I |
| G0096A | FUEL POOL GIRDER TENDON INSERVICE INSPECTION | I |
| G0110A | ELECTRICAL DISTRIBUTION ADEQUACY/GDC-17 | I |
| G0140A | UPGRADE SECURITY COMPUTER AND CARD READER | I |
| G0156A | PROVIDE CAD SUBSYSTEM DIVISIONAL SEPARATION | I |
| G0159A | REMOVAL AND ANALYSIS OF RPV INVESSEL IRRADIATION SPECIMENS | I |
| G0237A | REACTOR WATER LEVEL REFERENCE LEG CONTINUOUS BACKFILL | I |
| M0121E | PROVIDE THERMAL OVERLOAD PROTECTION FOR AC MOTOR OPERATED VALVES | I |
| P0057E | HOTSIDE-COLDSIDE WALKDOWN REPAIRS | I |
| S0033B | CONTROL ROOM UPGRADE | I |

| CATEGORY I & II PROJECTS LISTING | | |
|---|---|---|
| PID NUMBER | PROJECT TITLE | COMMITMENT CATEGORY |
| | HVAC UPGRADE (FAIM #A0001666) | II |
| | SIMULATOR CORE THERMAL UPGRADE (FAIM #10000454) | II |
| | SIMULATOR INSTRUCTOR STATION (FAIM #10000453) | II |
| | UNIT 1 & 2 ROTOR REPLACEMENT (FAIM #10000621) | II |
| 01757A | PROCESS COMPUTER REPLACEMENT | II |
| 02317A | REPLACE SHAFT DRIVEN OIL PUMP FOR REACTOR FEEDPUMP TURBINE WITH MOTOR DRIVEN PUMP(S) | II |
| 02549A | SCREEN WASH PUMP UPGRADE | II |
| 03484A | HPCI ROOM C02 SYSTEM ALARM | II |
| 04031A | RESIDUAL HEAT REMOVAL HEAD SPRAY REMOVAL | II |
| 04688A | FEEDWATER CONTROL SYSTEM REPLACEMENT | II |
| 04830A | MAINTAIN THE BSEP ENVIRONMENTAL QUALIFICATION PROGRAM | II |
| 04963A | REACTOR WATER CLEAN UP PUMP | II |
| 05092A | REACTOR BUILDING INSTRUMENT RACK REPAIR/UPGRADE | II |
| 05307A | DC BATTERY LOAD STUDY | II |
| 05429A | WATER BOX AIR REMOVAL | II |
| 05806A | RADWASTE EFFLUENT RELEASE LINE REPLACEMENT | II |
| 05892A | EFFECT OF ELECTRICAL SYSTEM VARIATIONS ON TURBINE GENERATOR TORSIONAL RESPONSE | II |
| 05983A | BATTERY ROOM HVAC | II |
| 06202A | OFF-GAS DRAIN TANKS RESERVOIR | II |
| 06650A | REACTOR PRESSURE VESSEL THERMAL CYCLING EVALUATION | II |
| 06661A | TRANSVERSE IN-CORE PROBE SYSTEM | II |
| 06729A | DREDGE SPOILS DISPOSAL | II |
| 07148A | REPLACE HPCI, RCIC AND RPS TOPAZ INVERTERS | II |
| 07208A | REMOVE/REPLACE OBSOLETE BAILEY RECORDERS | II |
| 07438A | REPLACEMENT OF OFF-GAS RADIATION MONITORING RECORDERS | II |
| 07848A | REACTOR BUILDING ROOF VENT | II |
| 07862A | REPLACE LIGHTING AND COMMUNICATIONS UNINTERRUPTIBLE POWER SUPPLY | II |
| 08262A | DRYWELL COOLERS LOSS OF COOLING ACCIDENT LOCKOUT O /ERRIDE | II |
| 08341A | RPV SHELL TEMPERATURE MONITORING THERMOCOUPLE CABLE REPLACEMENT | II |
| 12420A | CONTROL BLDG HVAC CONDENSATE DRAIN REPAIR | II |
| 12984C | JET PUMP BEAM REPLACEMENT | II |

| CATEGORY I & II PROJECTS LISTING | | |
|---|---|---|
| PID NUMBER | PROJECT TITLE | COMMITMENT CATEGORY |
| 31856B | FIRE BARRIER UPGRADE | II |
| 80203A | DIESEL GENERATOR FUEL OIL LEVEL | II |
| 81401A | FLOOR DRAIN FILTER RETROFIT | II |
| 84489B | 480-AC MOTOR PROTECTION MODIFICATION | II |
| 84587A | RADWASTE SAMPLING SYSTEM UPGRADE | II |
| F0025C | EQUIPMENT DATABASE SYSTEM | II |
| G0015A | SMALL MODS | II |
| G0050A | SERVICE WATER TASK | II |
| G0058A | TURBINE UPRATE | II |
| G0075A | LOCAL POWER RANGE MONITOR CABLE REPLACEMENT IN DRYWELL | II |
| G0083A | INSTRUMENT AIR COMPRESSORS | II |
| G0105A | BWR THERMAL HYDRAULIC STABILITY ISSUE | II |
| G0180A | 125/250 VDC BATTERY GROUND DETECTION IMPROVEMENTS | II |
| G0193A | BNP REFRIGERANT REPLACEMENT | II |
| G0218A | MAKE TEMPORARY POWER FEEDS PERMANENT | II |
| G0249A | TORUS LINER PRESERVATION | II |
| G0250A | REACTOR VESSEL CORE SHROUD INSPECTION/REPAIR | II |
| G0251A | HYDROGEN WATER CHEMISTRY | II |
| M0066A | REFUEL BRIDGE UPGRADE | II |
| P0057B | SERVICE WATER AND CIRCULATING WATER INTAKE AREA ENHANCEMENT | II |
| R0123A | RECIRCULATING SYSTEM DECONTAMINATION | II |
| R0123M | SPENT FUEL POOL COOLING ASSIST-PIPING & PENETRATIONS | II |

# MAJOR PROJECTS

## EXECUTIVE SUMMARY

### INTRODUCTION

Brunswick Nuclear Plant (BNP) has made improvements in the areas of system reliability, material condition of the plant, and management oversight of projects. These improvements directly contributed to the smooth and successful startup and operation of both units, and ensure long-term and sustained improvements in plant performance.

Changes to the BNP Three-Year Business Plan as a result of three management reviews during 1993, were incorporated into the plan to ensure long-term and sustained improvements in BNP performance. Plan changes were carefully evaluated based on balanced consideration of plant safety, reliability, and economics. Management control of projects has improved with the establishment of the Plant Review Group (PRG). The PRG reviews projects in accordance with the Nuclear Generation Group Guideline for Three-Phase Project Evaluation and Authorization. Each project is reviewed and authorized by PRG prior to proceeding with the study, design, or implementation phase. The study phase includes preliminary engineering and conceptual approaches to projects and is intended to establish the objectives, scope, success criteria, and viability of the project. The design phase includes all engineering work necessary to fully specify the actions to implement the project. The implementation phase includes installation, testing, plant acceptance and document update. The Three-Phase Evaluation and Authorization process ensures active PRG involvement in reviewing safety significance of project issues, scope of changes, priority, schedules, and cost. The result of PRG's direct involvement was clear scope definition, customer support for the defined scope and clear accountability for schedule and cost.

### PLAN ACCOMPLISHMENTS

Many projects have been completed since the December 1993 distribution of the BNP Three-Year Business Plan. Unit 1 projects include the digital feedwater control, digital steam leak detection, residual heat removal system valves, process computer and reactor water level instrumentation. The material condition of the service water and circulating water intake structure, instrument racks and several HVAC systems was upgraded. The CAC monitors were upgraded to seismic requirements. The fire barrier field inspections are complete.

The hardened wetwell vent and service water booster pump improvements have been completed on both Units. The chemical decontamination of the residual heat removal system was completed in Unit 2 and achieved a decontamination factor of 7.7. The safety related design basis documents were also completed.

Additionally, emergent projects that were not part of the BNP Three-Year Business Plan were completed. These projects include the Unit 1 core shroud, jet pump beam replacement, and hydrogen water chemistry. Several projects were completed to resolve reactor turbine generator board deficiencies such as level indication on the 3A and 3B feedwater heaters. The control logic for the control building emergency air filtration system has been modified to meet single failure criteria.

## CURRENT STATUS

Key projects completed during the recent Unit 1 outage are in progress for the current Unit 2 outage. These projects include the digital feedwater control system installation, digital steam leak detection, residual heat removal system valves upgrades, process computer replacement, and reactor water level instrumentation improvement. In addition, the torus liner preservation, seismic qualification of equipment (A-46) inspections, upgrade of the security computer and the control room work space projects are in progress. Upgrades of the service water system diesel generator supply piping and the service water system pumps are in progress.

## FUTURE FOCUS

The projects portion of the BNP Three-Year Business Plan will be managed and implemented by the PRG and Three-Phase Evaluation and Authorization processes to ensure trends of continuous improvement are maintained. BNP management is committed to ongoing plan implementation that is results based, focuses on improved plant performance, and safely supports plant priorities.

## SUMMARY OF COMPLETED WORK

Twenty-one (21) projects were completed. Sixteen (16) projects were completed as planned, five (5) projects were completed earlier than planned.

| PROJECT# | PROJECT TITLE | CAT. | EXPLANATION |
|---|---|---|---|
| 00925A | Remote Shutdown Panel Level Indication | I | Unit 1 completed as planned. |
| G0051A | Secondary Containment Atmospheric Monitor Modules and Steam Leak Detection System Upgrade | I | Unit 1 completed as planned. |
| G0156A | Provide CAD Subsystem Divisional Separation | I | Unit 1 completed as planned. |
| S0033B | Control Room Upgrade | I | Unit 1 completed as planned. |
| 01757A | Process Computer Replacement | II | Unit 1 completed as planned. |
| 04688A | Feedwater Control System Replacement | II | Unit 1 completed as planned. |
| 08262A | Drywell Coolers Loss of Cooling Accident Lockout Override | II | Unit 1 completed as planned. |
| 12984C | Jet Pump Beam Replacement | II | Unit 1 completed earlier than planned |
| G0027A | Automatic Switch Company Applications | II | Completed earlier than planned |
| G0041A | Install and Operations Radio Communications System | II | Completed as planned. |
| G0075A | Local Power Range Monitor Cable Replacement in Drywell | II | Unit 1 completed as planned. |
| G0083A | Instrument Air Compressor Logic and Setpoint Change | II | Unit 1 completed as planned. |
| G0212A | RHR Service Water Pump Improvement | II | Unit 1 completed as planned. Unit 2 completed earlier than planned |
| G0215A | Modify Design of Drywell Radiation Monitors | II | Completed earlier than planned |
| G0250A | Reactor Vessel Core Shroud Modification | II | Unit 1 completed earlier than planned |
| P0057A | BNP HVAC Issue | II | Completed as planned. |
| P0057C | Caswell Pumping Station Structural Issues | II | Completed as planned. |
| P0075A | Fish Diversion Screen Upgrade | II | Completed as planned. |
| P0082A | Plant Road Intersection | II | Completed as planned. |
| R0123N | Residual Heat Removal Decontamination | II | Completed as planned. |

PROJECTS CANCELLED:

Thirteen (13) projects included in the previous business plan have been cancelled by the PRG due to issues being resolved with routine maintenance and engineering support. Also, some projects have been cancelled because improved maintenance has eliminated the need for the design change.

| PROJECT # | TITLE | CAT. | EXPLANATION |
|---|---|---|---|
| 01821A | Improve Lighting to Security Areas | I | Issue to be resolved by adding lights outside the Protected Area. Plant modification not required. |
| 02535A | Control Rod Blade Procurement/Disposal | II | Accelerated replacement of control blades is not required and instead of wholesale replacement blades will be replaced as a routine maintenance based on boron depletion. |
| 03088A | CAC-CAD System Upgrade | II | Design changes are not required. System will be upgraded via routine maintenance activities. |
| 04270A | Standby Liquid Control Relief Valves | II | Setpoint drift issue will be resolved via routine engineering support. |
| 07539A | Off Gas Valve Torque Investigation | II | PRG determined the valves could be operated as is and repairs are not needed. |
| 07647A | Resolve Thermal Binding of RHR F004 Valves | II | These valves are in the safe position (closed) when thermal binding may occur. Operating procedure changes have adequately addressed the potential binding issue. |
| 07818A | Control Circuit for Reactor Feed Pump Seal Water | II | The excessive gland seal water flow has been resolved by adjustments to the temperature control valve and operating procedure changes. |
| 84070A | Service Water System Repairs | II | Service Water system inspections and repairs will be conducted as routine maintenance and not as a project. |
| G0014A | Off-Gas System Upgrade | II | Upgrades to the Off Gas System were intended to improve reliability of system. However, the system is currently performing in a reliable manner. |
| G0050M | Service Water Flow Instrumentation | II | Other means of testing the service water system are available. |

| PROJECT # | TITLE | CAT. | EXPLANATION |
|---|---|---|---|
| G0054A | Main Steam Isolation Valve Upgrade | II | No design changes are necessary at this time. Engineering support of MSIV LLRT will be provided as routine support. |
| G0076A | Local Power Range Monitor Cable Replacement Outside Drywell | II | Cable degradation outside the drywell has not been observed. |
| G0094A | Corrosion Monitoring of the TBCCW System | II | Corrosion monitoring will be accomplished under initiative TY505. |

## PROJECTS REMOVED FROM 1994 PROJECT SCOPE FOR RE-EVALUATION:

Thirteen (13) projects included in the previous business plan have been removed from the 1994 project scope and are to be re-evaluated for possible inclusion in the 1995 project scope. Projects that were removed from the 1994 project scope will be re-evaluated and submitted to the Plant Review Group by 6/30/94 in preparation for the 1995 business plan.

| PROJECT # | TITLE | CAT. | EXPLANATION |
|---|---|---|---|
| G0119A | Reactor Recirculation Valve Upgrade | I | The hydraulic locking issue occurs only when valve is in the safe (closed) position. Existing procedural guidelines are sufficient to address potential hydraulic lock. |
| 01536A | Restore Cathodic Protection for Intake Structure | II | Investigate maintenance improvements, and if required define scope and submit to PRG . |
| 02164A | Core Thermal Uprate | II | Re-evaluate potential cost benefits and submit to PRG. |
| 04699A | Salt Water Transfer Pump Replacement | II | Redefine scope of project and submit to PRG. |
| 05503A | Replace 1-5A Feedwater Heater | II | Re-evaluate based on recent heat rate improvements and submit to PRG. |
| 06094A | Cooling Upgrade for Drywell, Reactor Building and Fuel Pool | II | Redefine the scope of project, perform economic analysis and submit to PRG. |
| 06407A | Refuel Floor Fire Detection Access | II | Redefine scope and submit to PRG. |
| 07197A | Ten Year Inspection of Recirculation Pump Motors | II | Evaluate alternative methods of performing inspection and submit to PRG. |
| 07250A | Eliminate Source and Intermediate Range Monitor Noise Spikes | II | Define the impact on plant operations and submit to PRG. |
| 08048A | Setpoint Control Program | II | Redefine the scope of a study and submit to PRG. |
| 31377B | Spent Fuel Pool Leak Repair | II | Evaluate scope of project after cask has been in pool and submit to PRG. |
| 77443A | Spent Resin Transfer-II | II | Redefine scope and submit to PRG for study. |
| P0074A | Anti-Foulant Coatings in Circulating Water System | II | Evaluate scope and schedule and submit to PRG. |

**PROJECTS RESCHEDULED:**

Twelve (12) projects have been rescheduled. Eight (8) projects have been rescheduled due to system outage date changes controlled by the Nuclear Generation Group Operating Plan. The Unit 1 B110 outage was shifted from completing June 7, 1995 to June 28, 1995. The Unit 2 B211 outage was extended from completing May 18, 1994 to July 19, 1994. The Unit 2 B212 was shifted from completing December 6, 1995 to April 29, 1996.

| PROJECT # | TITLE | CAT. | EXPLANATION |
|---|---|---|---|
| 00917I | Group 10 Addition to ERFIS Unit | I | Original schedule B211, new schedule B212. Control switch for this modification will not be received prior to closure of system window in B211. |
| 05092A | Reactor Bldg Instrument Rack Repair/Upgrade | I | Original schedule June 1995, new schedule May 1996 B212. The remaining racks will be studied to determine corrective actions. Corrective actions are planned for B212. |
| B0014A | Emergent Structural Issues | I | Original schedule December 1994, new schedule March 1995. Drywell entry required in B110. |
| G0024A | Invessel Core Spray Piping Repairs | I | Original schedule December 1995, new schedule May 1996 B212. |
| G0110A | Electrical Distribution Adequacy | I | Original schedule December 1995, new schedule December 1998 |
| G0140A | Upgrade Security Computer and Card Reader | I | Original schedule December 1994, new schedule April 1995. Integration of this design change into the plant on line work schedule is more complex than originally estimated. |
| M0121E | Provide Thermal Overload Protection for AC Motor Operated Valves | I | Original schedule December 1995, new schedule May 1996 B212. |
| 04031A | RHR Head Spray Removal | II | Original schedule B111 and B213, new schedule B110 and B212. Accelerated to realize labor and dose savings sooner. |
| 07148A | Replace HPCI/RCIC and Topaz Inverters | II | Original schedule December 1995, new schedule May 1996 B212. |
| 07862A | Replace Lighting and Communication UPS | II | Original schedule June 1995, new schedule November 1995. Work scheduled after B110. |

| PROJECT # | TITLE | CAT. | EXPLANATION |
|---|---|---|---|
| 84587A | Radwaste Sampling System Upgrade | II | Original schedule July 1995, new schedule July 1996 E212. |
| M0066A | Refuel Bridge Upgrade | II | Original schedule December 1994, new schedule June 1995 B110. Scope of work requires in-core testing. |

PROJECTS ADDED:

Twenty-one (21) projects have been added to the business plan.

| PROJECT # | TITLE | CAT. |
|---|---|---|
| | Simulator Core Thermal Upgrade (FAIM #10000454) | II |
| | Simulator Instructor Station (FAIM #10000453) | II |
| | Unit 1 & 2 Rotor Replacement (FAIM #10000621) | II |
| 00925F | Appendix R, Thermolag Fire Wrap Issue | II |
| 02549A | Screenwash Pump Upgrade | II |
| 04963A | Reactor Water Cleanup Pump | II |
| 05307A | DC Battery Load Study | II |
| 05429A | Water Box Air Removal | II |
| 05983A | Battery Room HVAC | II |
| 06661A | Transverse In-core Probe System | II |
| 06729A | Dredge Spoils Disposal | II |
| 07208A | Remove/Replace Obsolete Bailey Recorders | II |
| 07438A | Replacement of Off-Gas Radiation Monitoring Recorders | II |
| 12420A | Control Bldg HVAC Condensate Drain Repair | II |
| 12984C | Jet Pump Beam Replacement | II |
| 80203A | Diesel Generator Fuel Oil Level | II |
| G0050A | Service Water Task | II |
| G0249A | Torus Liner Preservation | II |
| G0250A | Reactor Vessel Core Shroud Inspection/Repair | II |
| G0251A | Hydrogen Water Chemistry | II |
| P0057E | Hotside-Coldside Walkdown Repairs | II |

## UPGRADE REPLACEMENT EQUIPMENT TO NUREG 0588 CATEGORY I REQUIREMENTS

### I. PURPOSE AND SCOPE

The environmental qualification (EQ) rule (10 CFR 50.49) imposes replacement equipment requirements in paragraph L of the rule. In that paragraph, the EQ rule requires use of upgraded components when it becomes necessary to replace electrical equipment important to safety. To address this upgrade provision, BNP committed to a programmatic replacement with Category I electrical equipment qualified per NUREG 0588, unless sound reasons to the contrary exist which would preclude its replacement. This program will evaluate approximately 50 percent of the plant EQ-related electrical equipment. This project includes gradual but coordinated replacement of multiple similar components (where feasible) rather than replacement of individual components during isolated corrective maintenance activities or at the end of the individual component's qualified life. Where replacement of groups of components is not feasible or efficient, each affected component is upgraded based on the most efficient approach relative to the entire project and relative to the individual application. This approach results in significant flexibility and efficiencies in the actual replacement work, in updating plant design configuration documentation, and in maintenance and test programs. Future audits and inspections should conclude that management of environmentally qualified equipment is adequate. Unqualified or expired electrical components should not be found in the plant.

### II. EVALUATION

Schedule Index: 22 - With the exception of HVAC cooling of important components, the nuclear safety probabilistic risk assessment (PRA) does not explicitly address the survivability of equipment during accident conditions. It is assumed that the equipment is designed to perform its function under accident conditions. Electrical equipment is required to be operational and capable of performing design safety functions over the life of the plant, including during the adverse plant environmental conditions (e.g., temperature, pressure, and humidity) that are anticipated to occur in the event of an accident. Therefore, since nuclear safety is the basis for the EQ program, this project is judged to have a moderate impact on important systems in the PRA (0.5 x 32). The replacement equipment is expected to be inherently more reliable during normal operations, thus potentially increasing plant operational availability (0.2 x 12).

In addition, new components with increased reliability will reduce overall maintenance requirements. Similarly, since the approach being taken is to replace the equipment in an efficient, comprehensive manner rather than piecemeal, worker productivity and error avoidance will be enhanced, thus resulting in general operational and maintenance enhancements (0.5 x 8).

Economic Aspects: The upgraded equipment is generally more expensive, but this is somewhat offset by increased reliability and availability of current vendors. Replacement of some multiple components can be optimized in a manner that minimizes project cost. This has been recognized and is part of the planning process for this project. Although this replacement program has a regulatory-driven purpose, it will also relieve equipment obsolescence problems and will support BNP plant life extension and maintenance programs.

Related Standards: This project is related to the Work Management Policy for material condition.

Other Considerations: Component and inventory replacements will be accomplished as needed to avoid expiration of design life of installed equipment. The work will be accomplished first for equipment with less than a 40 year design plant life, then for equipment having a 40 year design plant life. In some cases where advanced change-out is not prudent, the needed quantities of upgraded replacement equipment will be purchased and retained in stock. Thereafter, the affected components will be replaced with the stocked replacement components when it is actually required for corrective or preventive maintenance. This approach will also remove older stock replacement components and thus minimize the possibility of using non-upgraded components from stock. Due to the range of equipment and systems affected by this project, much of this work will have to be accomplished during unit outages.

## III. CONCLUSION

This project implements the plant response to important equipment environmental qualification requirements contained in 10 CFR 50.49. The project will continue in a systematic, coordinated manner until all plant electrical equipment conforms to 10 CFR 50.49. This will allow a controlled, cost effective resolution of this issue.

## IV. STATUS

Project requires design phase approval by the Plant Review Group.

## V. TARGET COMPLETION

Design and Implementation activities are scheduled through 1994. This will become a routine engineering and maintenance activity for future years.

| | |
|---|---|
| PROJECT MANAGER | BILL GUARINO |
| PID | 00912A |

ROSEMOUNT TRANSMITTER REPLACEMENT

## I. PURPOSE AND SCOPE

Rosemount model 1152 transmitters (reactor plant pressure, flow, and level instrumentation) are being replaced before the end of their ten year qualified life. The upgrades are being done at this time due to the commitment to meet the requirements of the rule, the approaching end of qualified life, and the availability of a qualified replacement, Rosemount model 1153B transmitters. Rosemount model 1153B instruments are qualified to Category I (NUREG 0588) criteria, as required by 10 CFR 50.49( ).

## II. EVALUATION

Schedule Index: 22 - The installed Rosemount transmitters are critical pressure, level, and flow instrumentation components in safety-related systems. Replacing the Rosemount transmitters with a more reliable model will reduce the probability that automatic functions would fail to actuate during an accident scenario, especially in the harsh environments possible during a postulated accident. Since safety-related indication instrumentation circuits are also dependent on these transmitters, a moderate impact relative to nuclear safety is assigned to this project (0.5 x 32). In addition, the replacement equipment is expected to be inherently more reliable during normal operations, thus potentially increasing plant operational availability (0.2 x 12). Also, new components with increased reliability will reduce overall maintenance requirements. Moreover, since the approach being taken is to replace the equipment in an efficient, comprehensive manner rather than piecemeal, worker productivity and error avoidance will be enhanced, thus resulting in general operational and maintenance enhancements (0.5 x 8).

Economic Aspects: This project contributes significantly to equipment reliability and operator confidence in Control Room indications important to safety. The upgraded equipment is also expected to require less maintenance in the future.

Related Standards: This project primarily impacts Work Management Policies for operating parameters and material condition. The regulatory commitment to upgrade the level of electrical equipment EQ is met by this project.

## III. CONCLUSION

Rosemount transmitters are critical to level and flow instrumentation and will be upgraded to environmental qualification requirements in an expeditious manner.

## IV. STATUS

This project has been implementation phase approved by the Plant Review Group.

## V. TARGET COMPLETION

June 1, 1994.

PROJECT MANAGER PAUL WAGNER
PID 00912D

EMERGENCY RESPONSE FACILITY ISOLATION SIGNALS - GROUP 10

## I. PURPOSE AND SCOPE

This project addresses the need to add the Group 10 containment isolation signals to the Emergency Response Facility Information System (ERFIS) displays. The primary containment logic functions to ensure that the appropriate containment isolations occur in response to abnormal plant conditions. The Group 10 containment isolation signals should be remotely indicated at the Emergency Response Facility as required by NUREG 0737, Supplement 1, paragraph V. These isolation signals will also be added to the ERFIS (SPDS) display in Unit 1 and Unit 2 control rooms. This NUREG was implemented at BNP by the establishment of the ERFIS system. However, during the initial installation of the ERFIS system, the signals from the Group 10 isolation valves, which isolate the normal pneumatic supply to the reactor vessel drywell, were not included in the work scope. To satisfy the requirements of NUREG 0737 Supplement 1, the Group 10 isolation valves must be added to the ERFIS system. The project is under design and is planned for installation for Unit 1 during B110R1 and Unit 2 during B212R1. The successful installation of the Group 10 containment isolation signals would meet the requirements of NUREG 0737, Supplement 1, paragraph V.

## II. EVALUATION

Schedule Index: 8 - There are no appreciable nuclear safety implications for this project. This initiative would provide additional information to the operators on the status of the instrument air containment isolation valves during scenarios involving reopening of main steam isolation valves and containment venting. It would also provide information on the status of containment integrity during events involving core damage and containment release. A nuclear scaling factor of 0.2 was assigned to this project based on low impact to the instrument air system and improved ability to monitor the status of containment integrity during a severe accident. The plant will be enhanced with the addition of the Group 10 Containment Isolation valves which will aid the operators performance in verifying plant conditions (0.2 x 8).

Economic Aspects: After installation of the Group 10 signals to ERFIS, there are no additional costs for this project.

Related Standards: This project relates to the Work Management Policy on operating parameters because it improves the operators' ability to monitor plant conditions.

Other Considerations: In order for this work to be accomplished, it must be scheduled during an outage and coordinated with other projects that may have an interface with 00917I. However, the display and database development can be accomplished during non-outage time periods. In order to address its commitments to NRC, CP&L has committed to complete this project.

## III. CONCLUSION

Relative to other projects, this project has a lower Scheduling Index. However, this project will be completed because the Group 10 containment isolation signal indicators are required to be located in the ERFIS per NUREG 0737 and to meet the NRC commitment date.

## IV. STATUS

This project requires implementation phase approval by Plant Review Group.

## V. TARGET COMPLETION

Unit 1 B110
Unit 2 B212

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| PROJECT MANAGER | CRAIG MARCH |
| PID | 009171 |

## REMOTE SHUTDOWN PANEL LEVEL INDICATOR

### I. PURPOSE AND SCOPE

The purpose of this project is to install a new reactor vessel level indicating transmitter loop to the remote shutdown panel (RSP) to comply with 10 CFR 50 Appendix R, Section I.

### II. EVALUATION

Schedule Index: 16 - Use of the RSP is credited in a PRA scenario involving flooding of the cable spreading room (i.e., failing battery chargers) and failure of DC power. Failure to monitor reactor level using the RSP indicators could result in up to a 4 percent increase in core damage frequency. Therefore, this project does significantly affect the accuracy of a system important to safety, because the operator may have to take corrective action based on indicated RSP reactor level indication. A nuclear safety scaling factor of 0.5 was assigned to this initiative (0.5 x 32). Future external event analyses (e.g., fire) may cause a higher weight in the nuclear safety scaling factor with respect to RSP changes. This initiative is also a plant enhancement because it provides the RSP operator with a more accurate indication of reactor level and consequently prevents incorrect operator actions based on previously inaccurate reactor level indication (0.2 x 8). Finally, this project would result in a net dose expenditure with no future dose savings for the remaining life of the plant. Therefore, there is a low negative impact on ALARA (-0.2 x 9).

Economic Aspects: There will be a small increment of continuing costs as a result of the periodic instrument loop calibrations required. The net expected benefits of this project cannot be clearly defined because the modification improves the reactor level indication at the RSP, which is only employed under narrowly defined conditions.

Related Standards: The applicable Work Management Policies are those for material condition and operating parameters.

Other Considerations: All of the work with the exception of the final tie-in of the new instrument tubing to the B21-N037 transmitter can be completed while on-line. The final tie-in will require a system outage for the "B" Loop of RHR. The work is scheduled for refueling outages B109R1 for Unit 1 and B211R1 for Unit 2. This project is a CP&L commitment for RSP instrumentation as identified in the ASCA report dated October 1984.

### III. CONCLUSION

This project is required to comply with 10 CFR 50, Appendix R, and is to be completed during the B109R1 and B211R1 outages. This project satisfies the performance goal of the Alternate Shutdown Conformance Assessment report.

### IV. STATUS

Project has been implementation phase approved by the Plant Review Group. Unit 1 installation is completed; Unit 2 installation will be completed during B211R1.

### V. TARGET COMPLETION

June 30, 1994.

PROJECT MANAGER LARRY WALTON
PID 00925A

## APPENDIX R THERMO-LAG FIRE WRAP ISSUE

### I. PURPOSE AND SCOPE

The NRC has issued several Information Bulletins, Notices and a Generic Letter concerning the failures of Thermo-Lag 330-1 material to perform their intended fire protection function. CP&L has placed fire watches as compensatory measures in the areas containing this material until the material can be successfully tested or upgraded to provide the appropriate protection.

NUMARC has provided industry direction by coordinating this issue with the NRC and performing an industry testing program.

This material is located in the Control, Reactor, Service Water and Diesel Generator Buildings. The configurations range from small conduit wraps to large junction box enclosures.

### II. EVALUATION

The NRC issued a revision to Generic Letter 92-08 requesting additional information concerning CP&L's configurations and plans for resolution of this issue. CP&L provided a response to this request on 2/14/94 outlining a plan to perform a Project Study and Testing Program.

The Project Study would review each configuration to determine to best possible option for resolution of the Thermo-Lag issue. This could include elimination of the Thermo-Lag through changes in CP&L's Safe Shutdown Methodology, rerouting the circuits, upgrading the existing Thermo-Lag or replacing the Thermo-Lag with a different fire wrap material.

The Test Program will consist of configurations not bounded by the current NUMARC Testing Program. This included large junction boxes. The Testing Program and Project Study will be performed in parallel to streamline the final resolution and implementation.

### III. CONCLUSION

This project will continue to ensure resolution of Thermo-lag issues.

### IV. STATUS

Project has been study phase approved by Plant Review Group.

### V. TARGET COMPLETION

The response to Generic Letter 92-08, Supplement 1 outlined that CP&L would provide an integrated schedule within 90 days of NUMARC completing their testing program which is currently scheduled for September of 1994.

PROJECT MANAGER STEVE HARDY
PID 00925F

## SERVICE WATER SYSTEM PIPING PHASE III

### I. PURPOSE AND SCOPE

This project upgrades the service water (SW) pumps for long term seismic qualification, with self-lubrication, and with improved thrust bearings. This SW pump modification eliminates the need for the SW lube water pumps, which will eventually be removed. The success criterion of this project is that no unit forced outages or plant deratings will be attributable to the SW system and the pumps meet long term seismic integrity.

### II. EVALUATION

Schedule Index: 32 - This project moderately improves the availability of the SW system and therefore reduces the probability of core damage or containment release (0.5 x 32). The probability of a SW system train being out of service is included in the PRA and the project is judged to have a moderate positive impact on SW system availability. It eliminates the need for ASME Section XI Relief Request PR-05, which requests relaxation of required performance testing of the SW lube water pumps. Seismic upgrade and self-lubrication changes to the SW pumps will reduce the potential personnel safety hazards resulting from high SW pump maintenance (0.2 x 29). Finally, this project contributes to improvement in the operations and maintenance of the SW system and reduces the maintenance and testing requirements for the SW system; therefore, this project is considered an important plant enhancement (0.5 x 8).

Economic Aspects: The expected benefits of this project are future savings due to reduced maintenance requirements and, therefore, increased unit availability.

Related Standards: ISI testing of the SW lube water pumps will be eliminated and therefore simplify testing requirements of the SW system. This will close the relief request PR-05 on the SW lube water pumps, which is currently a commitment to the NRC. The outage-associated work of this project has been planned, scheduled, and carefully integrated with all other major SW projects.

Other Considerations: Upgrading SW pumps (and removing the SW lube water system) can be accomplished without an outage because of the redundancy of the SW system. Upgrades to the SW pumps are critical to meeting the NRC commitment date which are scheduled to be completed November 1994.

### III. CONCLUSION

Eliminating the SW lube water system reduces ISI testing requirements and some Technical Specification considerations. This project will continue to ensure the service water pumps have long term seismic qualification, are designed for self-lubrication, and are backfitted with improved thrust bearings.

### IV. STATUS

Project has been implementation phase approved by the Plant Review Group.

### V. TARGET COMPLETION

November 1994 for the committed portion of this project.
December 1995 for ripout of the Lube Water System.

PROJECT MANAGER CHRIS HUGHES
PID 01538A

## SEISMIC QUALIFICATION OF EQUIPMENT - NUREG 1030

### I. PURPOSE AND SCOPE

Methods to analyze the adequacy of equipment to withstand seismic events have changed in the years since the Brunswick Nuclear Plant was designed and constructed. Because of these changes in methodologies, the seismic margins of older equipment are unknown. NRC resolution of Unresolved Safety Issue (USI) A-46, "Seismic Qualification of Equipment in Operating Nuclear Power Plants", is promulgated in NRC Generic Letter 87-02 and requires all utilities whose plants are not qualified to current criteria to evaluate their electrical and mechanical equipment required for hot shutdown for adequate seismic qualification. The Seismic Qualification Utility Group (SQUG), of which CP&L is a member, developed general implementing guidance for performing the reviews. NRC approved the use of this guidance in a Safety Evaluation Report dated May 22, 1992. In addition, the NRC issued Generic Letter 88-20, "Individual Plant Examination for External Events (IPEEE) for Severe Accident Vulnerabilities". The generic letter requested each licensee to conduct an examination to establish the effects of seismic events, internal fires, high winds, floods, transportation, and nearby facility accidents. Licensees are also to confirm that there are no comparable plant-unique external events being excluded from examination.

The purpose of this project is to implement the resolution of USI A-46 by analyzing the seismic adequacy of Brunswick electrical and mechanical equipment required to accomplish and maintain the plant in a hot safe shutdown condition for 72 hours. Also included in the scope of this project are the evaluation of outliers and the scoping of modifications to address any deficient conditions found during the effort. The final product will be a report documenting the results of the review, including identification of deficiencies that may require correction. The seismic portion of the IPEEE will be performed under this project using a seismic margins methodology that screens components according to safety importance and seismic capacity against a peak ground acceleration of 0.03g. The option to perform a Probability Risk Assessment (PRA) will be maintained by gathering sufficient data for component fragility calculations.
This screening process will be performed concurrently with the USI A-46 program. Assurance that safety-related electrical and mechanical equipment can perform their intended functions during and following a seismic event or identification of corrective actions to resolve deficient conditions will constitute successful completion of this project. Further assurance of successful completion will be evidenced by NRC review and acceptance of Brunswick Nuclear Plant's implementation of USI A-46.

### II. EVALUATION

Schedule Index: 30 - This project could have a significant impact on future analyses of external events. All plant systems could be affected by a seismic event and severe consequences could result if equipment is not assured of meeting the specified qualification criteria. This results in a significant impact on the core damage frequency due to seismic events (1.0 x 32). Verifying seismic qualification will require inspection and system walkdowns in radiation areas and result in exposure to workers. This exposure will not be made up by any ALARA benefits afforded by the project over the lifetime of the plant, therefore resulting in a negative ALARA scaling factor (-0.2 x 9).

Economic Aspects: The project requires a short-term investment to conduct component inspections and walkdowns, with no identified positive or negative economic benefits extending beyond the completion of the project.

Related Standards: The Work Management Policy on material condition of the plant is applicable to this project.

**PID 04042A**
**Category I**

Other Considerations: The project will be performed under the guidelines of the General Implementing Procedure (GIP) developed by SQUG. NRC approval of the procedure has been obtained. After the study is completed, a report will be prepared and submitted to NRC by June 30, 1995 that documents the results and describes the schedule for correcting any deficiencies identified during the review. Margins for the plant with respect to seismic events as required for the IPEEE analysis will also be established under this project.

## III. CONCLUSION

Because the methods used to seismically qualify safety-related systems were not as capable as current methodologies, plant systems will be reviewed to assure the capability to perform their functions during and after a seismic event. The NRC has expressed its concerns on this issue and recommended actions to be taken by licensees in Generic Letter 87-02. SQUG, of which CP&L is a participant, submitted and received approval from the NRC on generic implementing guidance for reviewing seismic qualification of equipment. CP&L plans to complete and document the SQUG and related IPEEE reviews by June 30, 1995.

## IV. STATUS

The Unit 2 project has been implementation phase approved by Plant Review Group. The Unit 1 project requires design phase approval by Plant Review Group.

## V. TARGET COMPLETION

June 1995 for both Units.

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| PROJECT MANAGER | CHUCK RAINES |
| PID | 04042A |

## REACTOR BUILDING INSTRUMENT RACK REPAIR/UPGRADE

### I. PURPOSE AND SCOPE

The original scope of this project addressed the Residual Heat Removal (RHR) instrument racks located on the -17' level of the Reactor Buildings. These instrument racks were rusting and needed to be repaired or replaced to prevent further degradation which could lead to a condition adverse to quality and safety. Pre-Startup work activities replaced three racks, and installed additional seismic restraints on five racks in each unit to support long term operability. All identified pre-startup work items have been successfully completed in Unit 1 and Unit 2. An engineering Study is in progress to determine the baseline corrosion of the five remaining instrument racks in each Unit on the -17' levels, and develop a plan for any corrective actions identified by this Study.

Success for this project will be the completion of any actions required to maintain the long term seismic qualification on U1/U2 instrument racks located in the Reactor Building -17' level, and to determine the means required to ensure that the rack mounted components will withstand a Design Basis Event.

### II. EVALUATION

Schedule Index (SI): 14 - The SI is composed of the nuclear safety, unit availability, and ALARA categories. For nuclear safety there is a moderate improvement in the availability of systems of high importance (0.5 x 32). Unit availability has been increased since some instrument racks were repaired or replaced to maintain the plant in an operational condition conducive to quality and safety (0.2 x 12). There is a moderate negative impact on the ALARA category because work on these instrument racks resulted in approximately 18 man rem dose range (-0.5 x 9).

Economic Aspects: The expected benefits of this project are the improved material condition and reliability of the Reactor Building Instrument Racks. Additional benefits received will be reduced long term maintenance costs due to lower maintenance on the stainless steel instrument racks.

Related Standards: This project directly relates to the Work Management Policy for material condition. Action will be taken to remove and control the reoccurrence of corrosion at the cosmetic stage.

Other considerations: Any additional work identified for this project will have to be accomplished during outages. It will be necessary to coordinate this project with other RHR refurbishment and painting projects during these outages.

### III. CONCLUSION

It is important for the material condition of the power plant not to degrade to the point where conditions could become adverse to both quality and safety. Therefore this project will be completed as scheduled to ensure the seismic qualification for the Reactor Building Instrument Racks is maintained.

### IV. STATUS

Project has been study phase approved by the Plant Review Group.

### V. TARGET COMPLETION

May 1996.

PROJECT MANAGER LARRY WALTON
PID 05092A

## HIGH PRESSURE COOLANT INJECTION/REACTOR CORE ISOLATION COOLING

### I. PURPOSE AND SCOPE

Resolve problem of inaccurate High Pressure Coolant Injection (HPCI) and Reactor Core Isolation Cooling (RCIC) instrument readings caused by instrument piping vapor pockets. This project originated from LER #1-88-014 involving inadequate steam leak detection setpoints and the affect the loop seals had on these setpoints. The modification is to eliminate the loop seal.

### II. EVALUATION

This project ensures proper HPCI/RCIC steam leak detection.

### III. CONCLUSION

This project will be resolved as scheduled.

### IV. STATUS

The Unit 1 plant modification has been completed. The Unit 2 Plant Modification (PM 88-022) was deleted form the B211R1 Outage. Measurements taken during the B211R1 will be used in an engineering evaluation that will justify canceling this project.

### V. TARGET COMPLETION

Unit 1 Complete
Unit 2 B211R1

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| PROJECT MANAGER | PAUL FLADOS |
| PID | 06156A |

## DIESEL GENERATOR START & CONTROL AIR MOISTURE REMOVAL

### I. PURPOSE AND SCOPE

The purpose of this project is to determine the most efficient and cost effective method of moisture and crud removal from the air for the starting and control air systems (SCAS) of the diesel generators to comply with the requirements in GL 88-14. Currently, frequent manual moisture/oil blowdowns are required on both the starting and control air systems at various locations in order to maintain air quality. This requires auxiliary operators to lean over rotating equipment. Moreover, particulate fouling and eventual failure of SCAS components such as control air regulators has occurred as a result of poor quality air. Also, while the desiccant dryer/filter is being renewed, the associated emergency diesel generator (EDG) must be declared inoperable. The project is in the implementation phase. The proposed modifications are to relocate air compressor number 2 air receiver drain valve for safer access during manual blowdown. Additionally, the existing desiccant dryer/filter on each control air header will be replaced by two larger capacity dryer/filters in parallel. This part of the modification will allow dryer/filters to be renewed without declaring the associated EDG inoperable. The success criteria of this project are that no limiting conditions for operation (LCOs) on the emergency diesel generators will result from deficiencies relating to moisture in the SCAS and no personnel accidents will occur as a result of manual blowdowns on the SCAS.

### II. EVALUATION

Schedule Index: 26 -The proposed improvement in the SCAS has a medium positive impact on the EDGs, which is considered a highly important system to PRA model in terms of core damage frequency. Improvement in the reliability of the SCAS will reduce the probability of failure-to-start occurrences and hence improve the overall station blackout scenario (0.5 x 32). This project eliminates a potential threat to personnel safety which is considered to be a condition that could result in a lost time accident (0.2 x 29). Manual blowdowns that have to be performed regularly by auxiliary operators will be less hazardous in that less frequent blowdowns will be performed and drain valves will be relocated for easier access. Additionally, the improvement in the SCAS air quality will correct a deficiency which has a potential for a loss of unit availability (0.2 x 12). Since 1981, there have been at least 7 Technical Specifications LCOs on the EDGs which were directly attributable to the air quality in the SCAS.

Finally, this initiative contributes to a small improvement in the operations and maintenance of the EDG SCAS by maintaining its air quality and reducing valve and piping degradation due to crud, moisture, oil, and particulates in the air (0.2 x 8).

Economic Aspects: Annual routine preventative maintenance costs would rise by a small amount. The expected benefits of this project are reduced periodic blowdowns and other routine maintenance requirements of the SCAS, and increased availability and reliability of the emergency diesel generators through the remaining life of the units.

Related Standards: The applicable Work Management Policy is that for material condition.

Other Considerations: The majority of this modification can be implemented while the diesels are operable. A small part of the design change will be required during a diesel outage. The project is currently scheduled for refueling outages B109R1 and B211R1. CP&L letter NLS-91-106 dated April 18, 1991 to the NRC is the explicit commitment made by BSEP with regard to GL 88-14, item 1. One plant modification will address all diesel generators.

PID 06249A
Category I

## III. CONCLUSION

This project will be accomplished as scheduled to meet the requirements of GL 88-14, to increase diesel generator reliability and availability, and to improve personnel safety of auxiliary operators. The material condition and operability of the diesel generators are particularly important to nuclear safety. Therefore, this project has beea given a relatively high priority.

## IV. STATUS

This project has been implementation phase approved by the Plant Review Group.

## V. TARGET COMPLETION

May 1994.

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| PROJECT MANAGER | DENNIS COOPER |
| PID | 06249A |

BNP PLANT BUILDING STEEL

## I. PURPOSE AND SCOPE

The purpose of the BNP plant building steel verification program is to close out the Notice of Deviation in NRC Inspection Report (IR) 92-14. Licensee Event Report (LER) 1-88-35 and Unresolved Item (UI) 89-18-02 identified an overstress condition in one beam in each Reactor Building. In response, in 1990, CP&L began walkdowns of miscellaneous steel in the Reactor Building outside the drywell, under project B0060A, As-Built Verification of Miscellaneous Steel. In early 1992, in response to IR 92-14, CP&L expanded the program to include drywell platform steel (because of similarities with miscellaneous steel design and construction); this program is being accomplished in two phases. The Phase I Program consists of engineering walkdowns of miscellaneous steel inside the drywell, in the reactor building, and outside the drywell to categorize each steel member and connection as adequate or requiring further action. Those requiring further action were evaluated using restart criteria. The Phase II Program consists of analysis of representative platform sections in the drywell and in the Reactor Building outside the drywell using UFSAR criteria, documentation and verification of miscellaneous structural steel. The walkdowns associated with Phase I and the majority of Phase II have been completed.

Walkdowns and analyses performed to date have shown that, despite occasional minor construction variances, construction of miscellaneous steel in the Reactor Building outside the drywell is generally of good quality and none of the variances adversely affect safe plant operation. In the event that repairs or modifications are required, such work will be completed under the scope of projects B0060D and B0060E.

The success criteria for this program are that the structural steel affected by the program will satisfy the design requirements of the 1978 Edition of the AISC Specification for the Design, Fabrication, and Erection of Structural Steel Buildings, consistent with the Brunswick Plant Updated FSAR and that there will be greater assurance that plant drawings accurately reflect current as-built conditions.

## II. EVALUATION

Schedule Index: (-13) - No nuclear safety problems have been found to date and none are expected; the purpose of this program is to verify that building steel meets design requirements in the updated FSAR. Nevertheless, even though the likelihood that a seismically-induced failure of a structural member could damage a safety-related system is very remote, such a failure could have an impact on a safety system function of high importance (0.2 x 32). The walkdowns necessary to implement the program will greatly increase the chance that a worker could be injured due to a fall or falling objects (-0.5 x 29) and will result in significant worker dose even though steps (such as the use of photographs) have been taken to minimize the accumulated dose for the project effort (-1 x 9). The added confidence in structural steel design margins and in the currency of design drawings and calculations, and the contribution these make to the efficiency of the modification process, represent a moderate plant enhancement (0.5 x 8).

Economic Aspects: This two-phase program has been undertaken to provide assurance that building steel meets design requirements in the updated FSAR. Once completed, this program will result in negligible continued financial costs. The updated drawings and calculations resulting from the program will make subsequent plant modifications, which relate to or interface with structural steel, easier and quicker to complete.

Related Standards: The Work Management Policies for material condition and design documentation apply to this program.

PID BNT622
Category I

Other Considerations: Walkdowns and photographs in the drywell require a plant outage to accomplish and were given priority attention during the forced Unit 1 and 2 outages. The evaluation portion of the Phase II Program will begin in late 1994, with the scheduled completion to be in December, 1995.

## III. CONCLUSION

The Phase I Program is complete, as are the walkdowns for the Phase II Program. A minimal amount of walkdowns may still be required for selective platforms to determine actual locations of large piping attachments.

## IV. STATUS

This project requires design phase approval by the Plant Review Group.

## V. TARGET COMPLETION

December 1995.

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| PROJECT MANAGER | SUSAN VANN |
| PID | BNT-622 |

EMERGENT STRUCTURAL REPAIRS

## I. PURPOSE AND SCOPE

BNP initially responded to the pipe support issues of IEB 79-14 in 1979 and 1980. The Emergent Structural Repair project was initiated in 1986 to address other structural repairs for supports and miscellaneous steel used in the plant. In 1988, the project incorporated additional response to IEB 79-14 to provide enhancements to pipe supports needed in order for them to meet original design requirements.

Other work not related to IEB 79-14 has been added to this project. Examples of such emergent items are fire protection support upgrades, HVAC support upgrades, conduit support upgrades and resolution of STSI structural deficiencies identified by EWRs. These deficiencies require either verification of structural support seismic qualification or implementation of structural reinforcements or repairs that meet seismic requirements.
The Drilled-In Anchor Sampling Programs have been initiated as a result of NRC Notice of Deviation in Inspection Report (IR) 92-14. The Unit 1 plant mod has been completed. The Unit 2 plant mod will be completed in outage B211R1.

The Emergent Structural Modifications will be considered successful when all plant structures and supports with seismic qualifications or other safety related design criteria are found to conform consistently to those requirements over the remaining life of the plant. The level of emergent structural work will decline, and work on structural supports should be primarily the result of inspections or walkdowns and EWR resolutions. Scope for modification to conduit supports in the Unit 1 drywell, and STSI repairs have been issued into PM 93-029 and will be performed during outage B110R1. An Emergent Structural Modification for each unit should remain in-place for repair of other structural deficiencies identified as STSI.

## II. EVALUATION

Schedule Index: 51 - This project is intended to assure the seismic qualification or requalification of supports for Category I and Category II structures and safety systems. This project exceeds the scope of the current nuclear safety probabilistic risk assessment (PRA) model. Nevertheless, a special seismic review was performed by the CP&L PRA Group to assess the significance of identified structural support deficiencies. This assessment indicated that the structural support corrective actions included in this project have a high impact on reducing the risk of core damage (1.0 x 32). Unit availability is also impacted directly (1.0 x 12) since structural supports have been found in the plant that do not meet seismic requirements. Potential also exists for personnel hazards due to failed supports, primarily during an earthquake (0.2 x 29). As a result of this project, continued upgrades and plant inspections, system walkdowns, and maintenance practices will provide additional general enhancements to the plant (0.2 x 8).

Economic Aspects: This project has financial impacts due to the commitment to perform repairs to STSI structures and supports that must be seismically qualified.

Related Standards: This project is primarily related to the Work Management Policy for maintaining plant material conditions within design and licensing requirements.

Other Considerations: The current commitment to the NRC is to complete IEB 79-14 pipe support work by the end of outage B211R1; CP&L has scheduled such work to meet this commitment. In addition, work under this project not related to the NRC commitment will continue past the commitment date, into outage B110R1.

## III. CONCLUSION

This project assures continued compliance with regulatory requirements, primarily STSI seismic support requirements. The impacts on safety and related systems plant availability are significant and aggressive implementation is warranted.

## IV. STATUS

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| PM 93-029 | Phase approval required for implementation. |
| PM 91-011 | Phase approval required for implementation. |
| PM 91-041 | Phase approved for implementation in 1994. |
| PM 93-030 | Phase approved for implementation in 1994 and 1995. |
| PM 92-082 | Implementation complete, mod closeout in 1994. |
| PM 92-083 | Phase approved for implementation in 1994. |

## V. TARGET COMPLETION

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|---|---|
| PM 93-029 | December 31, 1995 |
| PM 91-011 | December 30, 1994 |
| PM 91-041 | December 30, 1994 |
| PM 93-030 | December 31, 1995 |
| PM 92-082 | December 31, 1994 |
| PM 92-083 | December 31, 1994 |

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| PROJECT MANAGER | CHUCK RAINES |
| PID | B0014A |

## PIPING DESIGN TURNOVER PROGRAM

### I. PURPOSE AND SCOPE

Some BSEP design drawings and calculations have been found to differ from the as-built condition of piping and related equipment in the plant. One of the primary causes of this problem is incomplete turnover of detailed design information from the architect/engineer. The Piping Design Turnover Program is locating, packaging, and turning over to CP&L the UE&C pipe stress and pipe support calculations for Brunswick. CP&L is reviewing the calculations that are safety related and, where needed, upgrading them. Where safety related design calculations are missing, they are being recreated. Also, some plant walk-downs are being conducted where needed to verify drawing information.

The Piping Design Turnover Program will result in over 5000 revised piping-support drawings. In addition, over 400 piping isometric drawings and supporting calculation packages will be provided. The BNP Piping Design Control organization will integrate data into existing plant information systems (NRCS and EDBS) and will establish procedures to assure continued integrity of design information. Following project completion, an audit will be conducted to verify the consistency among related drawings, calculations, and the as-built plant configuration. Also the administrative procedures for plant modifications will be updated to ensure continued maintenance of design basis documents.

### II. EVALUATION

Schedule Index: 11 - This project has resulted in the changeout or modification of over 400 piping supports for safety systems. Of the 400 piping supports affected, about 200 involve the RHR system, including RHR service water. In most cases, these piping supports were adequate for their basic function, but they were not fully qualified. Thus, the actual impact of this project on RHR and service water system performance is considered to be low. However, because the RHR and service water system are high contributors to theoretical core melt frequency, a nuclear safety scaling factor of 0.2 is assigned (0.2 x 32). If design basis issues are not resolved, unit availability concerns could arise (0.2 x 12). Some personnel radiation exposure is incurred during walkdowns (0.2 x 9). The potential for increased efficiency in future design activities results in a significant plant enhancement (0.5 x 8).

Economic Aspects: The compiled design documents will improve efficiency in developing future modifications and in conducting operability evaluations. Long term maintenance of the affected piping design bases will be incorporated as a routine part of plant work that is already funded and staffed. The related data base management and design control activities are also already part of the routine plant work and staffing and are adequate to support long term requirements. Therefore, the net long term impact of this project is a reduction in BNP costs.

Related Standards: The applicable Work Management Policy for this project concerns design documentation.

Other Considerations: This type of documentation problem resulted in NRC IEB 79-14. Final closeout of IEB 79-14 issues and resolution of NCR S-86-021 are dependent on this project. The service water lubricating water and service water diesel generator supply and return systems are not within the scope of the NRC commitment. These systems are currently being modified and/or replaced; consequently, the associated design packages prepared by CP&L, contain current design documentation.

## III. CONCLUSION

This project will proceed as scheduled due to the importance of having accurate design basis documentation readily available.

## IV. STATUS

This project has been approved by management.

## V. TARGET COMPLETION

December 1994.

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| PROJECT MANAGER | SUSAN VANN |
| PID | B0018A |

## DESIGN BASIS RECONSTITUTION

### I. PURPOSE AND SCOPE

CP&L has undertaken the Brunswick Design Basis Reconstitution Project to structure the design bases and calculations/analyses applicable to the plant systems and generic issues. The project includes the collection and consolidation of design basis information from the Architect/Engineer (UE&C), the NSSS supplier (General Electric), and from CP&L licensing, regulatory compliance, and engineering files. This compilation includes the review and turnover of applicable historical correspondence and calculations related to system/component design and regulatory requirements or commitments. The scope of this effort includes capturing data for Brunswick systems and generic issues. All information will be sorted and stored in a computer database to enhance retrievability and control. The NRC has shown a high level of interest in plant design basis reconstitution. This project meets the guidance of NUMARC 90-12, "Design Basis Program Guidelines." The 1992 NRC policy statement on design basis information indicates that a generic letter will be issued requesting a description of all licensee programs and that the SALP process will be modified to include assessment of licensee design basis programs. The current CP&L program is sufficient to meet all anticipated regulatory standards. Additionally, design basis control will be necessary to maintain the option of plant life extension beyond the current license expiration through the license renewal process. The project is expected to uncover potential discrepancies which must be evaluated. A programmatic approach to identify, confirm, prioritize, track, and close out each discrepancy has been developed. Once completed, the design basis for safety related systems, structures and components at Brunswick will be clearly established, easily retrievable, and fully controlled.

### II. EVALUATION

Schedule Index: 24 - This project will resolve any discrepancies that arise as a result of the design basis reconstitution effort. Since the PRA model directly depends on the quality of plant design documentation, such discrepancies could invalidate important PRA assumptions and could impact calculated core damage frequency. Plant modifications to resolve discrepancies are expected to represent a moderate improvement to safety (0.5 x 32). The project should significantly reduce research time on modifications and engineering evaluations and analyses. The identification and disposition of potential discrepancies also represents a plant enhancement (1.0 x 8).

Economic Aspects: Once the upgrades of this project are complete, maintenance of design bases will be part of routine and are not considered as a part of this project. Ongoing resource savings are expected in the future, due to reduction of time spent on modification and engineering evaluation preparation.

Related Standards: The applicable Work Management Policy is that for design documentation.

Other Considerations: Writing of design basis documents was completed as scheduled in December 1993. Validation is expected to be completed by December 1995. Resolution of discrepancies is expected to continue through 1995 and 1996. The original NRC commitment date to complete the Brunswick Design Basis Reconstitution Project was December 1993; however, after further defining the work scope, the completion date was extended to December 1996. AC system and DC system calculation reconstitution efforts are covered in projects 05644A and G0017A, respectively.

### III. CONCLUSION

Efforts on this project will continue due to the importance of accurate and useful design basis documentation.

PID B0019A
Category I

## IV. STATUS

This project is approved by management.

## V. TARGET COMPLETION

Regulatory committed validations December 1995.
Total project December 1996.

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|---|---|
| PROJECT MANAGER | PAUL CAFALLERA |
| PID | B0019A |

REPLACE E11-F003A-B & F0024A-B WITH GLOBE VALVES

## I. PURPOSE AND SCOPE

This project replaces the RHR heat exchanger outlet valves E11-F003A/B, their actuators, and control switches with new flow control valves. The E11-F003s need to be replaced because of an NRC commitment to replace the valves (Generic Letter 89-10), their difficulty to throttle flow and the cascading effect on the E11-F017s of minimum valve wall thickness which could lead to through-wall leaks. The outboard low pressure coolant injection valves, E11-F0017A/B are currently being used to control reactor vessel cooldown rate while in the shutdown cooling mode. These valves are not designed for throttling and have experienced excessive erosion and cavitation resulting in premature valve body wear. Replacing the E11-F003A/B valves with a flow control valve will allow the F00: valves to assume the E11-F017 throttling function and allow the E11-F017s to be left full open, thus reducing their rate of erosion. The success criteria of this modification is to employ a more reliable valve (E11-F003A/B) designed to better control RHR flow in shutdown cooling mode with less E11-F017 valve wear such that valve life can be extended.

This project also replaces the E11-F024A/B valves with flow control valves. The E11-F024A/B valves are used to control RHR suppression pool cooling flow. The characteristics of the present valves are such that throttle control is difficult and causes cavitation and valve body erosion. The success criterion for these valves is to provide better control of suppression pool cooldown and significantly reduce valve wear.

## II. EVALUATION

Schedule Index: 22 - In addition to replacing the E11-F003A/B valves, this initiative replaces the E11-F024A/B valves with flow control valves that will result in better control of the suppression pool cooldown rate and significantly less valve wear. The dominant failure mode for the E11-F024A/B valves in the PRA is "failure to open during suppression pool cooling." Although the E11-F024A/B valves are assigned a high impact classification on the component importance table for the RHR system, replacement of the valves does not necessarily significantly improve their ability to open. Therefore, this project is assessed to have a moderate impact on the RHR system (0.5 x 32). The impact of replacing the E11-F003A/B on nuclear safety is less than the F024A/B valves.

With respect to the F003A/B valves, simpler and more reliable control of the reactor vessel cooldown rate during RHR shutdown cooling operation will reduce the probability of exceeding Technical Specification cooldown limits and operational temperature limits. In the past, BNP has been cited for violating these limits as described in Inspection Evaluation Report (IER) 88-15B. This project is also a moderate plant enhancement in that it improves the reliability of different modes of the RHR system (particularly the shutdown cooling mode) and it reduces the maintenance requirements on primary containment isolation valves and other inaccessible valves in high dose areas within the RHR system (0.5 x 8). Replacing the RHR valves will appreciably improve the reliability and availability of the RHR system. The degradation and eventual through-wall failure of RHR valves from premature wear will be reduced. Consequently, it is more likely that RHR system operability will be maintained and immediate plant shutdown will be avoided (0.2 x 12).

Economic Aspects: The expected benefits of these new valves are greater ease of operation, less valve wear, fewer valve maintenance demands, and reduced risk of technical specifications violations. Additionally, a degraded system condition economic evaluation of the consequences of delaying valve replacement of one loop was performed in April 1992. An estimated $3 million impact was evaluated due to a high risk of loss of plant availability.

PID G0010A
Category I

Related Standards: The applicable Work Management Policy impacted by this project is material condition. The following standards apply to this standard: 1) Temporary conditions should be removed or made permanent within three months of date of installation; 2) Commitments shall not be deferred or scope altered due to management failure to plan, schedule and assign resources; and 3) Projects, modifications, and major maintenance items which require an outage for implementation shall be ready to work no later than one month prior to the scheduled start date of the outage. The material condition of the RHR system will be significantly improved after the replacement of the E11-F003A/B and E11-F024A/B valves and actuators because there will be less likelihood of valve wear and degradation of valve function. Additionally, improved control of RHR shutdown cooling and suppression pool cooling modes will reduce the risk of exceeding cooldown rates and reactor vessel temperature Technical Specification limits. The valve replacement modifications must be carefully integrated, planned, and scheduled with outage management because this work will have a significant impact on outage critical path. Finally, the site has committed to the NRC to replace these valves and this commitment should not be deferred.

Other Considerations: Modifications for this project are scheduled during B109R1 and B211R1 outages. RHR loops would be inoperable during these outages. Currently, plans are to consolidate both modifications (the E11-F003s and E11-F024s) and work on both RHR loops during the B109R1 outage. Similarly, plans are to consolidate both Unit 2 modifications and work on both RHR loops during the B211R1 outage. These plans meet the NRC commitment dates. Performing work on both loops may extend refueling outages from ten weeks up to fourteen weeks. Because of the extended shutdown that both units are currently in, it is anticipated that there will be more extensive damage to the E11-F017 valves. Finally, completion of this project will eliminate operator work-arounds that are currently in place (i. e., use RHR Loop A for RHR shutdown cooling).

## III. CONCLUSION

The project will be accomplished as scheduled to meet the NRC commitment dates. This project will improve control of suppression pool cooldown and increase the reliability of different modes of the RHR system.

## IV. STATUS

This project has been implementation phase approved by the Plant Review Group. Unit one completed in 1993. Unit two installation is in progress during B211R1.

## V. TARGET COMPLETION

December 1994.

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| PROJECT MANAGER | DENNIS COOPER |
| PID | G0010A |

## DC VOLTAGE PROFILE STUDY

### I. PURPOSE AND SCOPE

Existing design basis calculations for the Brunswick DC electrical distribution system have been found, in some cases, to be unavailable or inadequate. The DC Voltage Profile Study has been undertaken to establish current, readily accessible DC electrical distribution system design basis calculations. Calculations to be provided include those to establish battery loading, DC distribution system voltage, battery charger sizing, DC system fault current and coordination, and DC system cable amperage capacity. The 1991 electrical distribution system functional inspection reaffirmed the need to upgrade or develop certain calculations which are a part of this project. Once complete, this project will document the capability of the present configuration and loading, and provide a basis to support future modifications and 10 CFR 50.59 safety evaluations. For a proposed change to the DC distribution system, documentation will be easily accessible to demonstrate whether a proposed change to the DC distribution system will cause overloading of components. The ability to quickly and accurately respond to design basis issues which may arise during an audit will be greatly enhanced.

### II. EVALUATION

Schedule Index: 10 - Upgrade or development of design basis calculations is not expected to have a substantial effect on DC distribution system design or operation. However, the project includes additional calculations to analyze battery loading profiles. The results of these calculations could lead to procedural or hardware changes that would increase the plant's ability to withstand station blackout. A nuclear scaling factor of 0.2 is assigned because of this potential low impact on core damage frequency (0.2 x 32). This project should have no appreciable effect on personnel safety, unit availability, unit capacity, or ALARA, but should reduce research time on modifications and engineering evaluations and analyses (plant enhancement, 0.5 x 8).

Economic Aspects: Once this project is completed, no continued costs are anticipated. Ongoing resource savings are expected in the future due to reduction of time spent on modification and engineering evaluation preparation.

Related Standards: The applicable Work Management Policy is design documentation.

Other Considerations: The calculations being developed are required by the NRC and presently either do not exist or are not in a usable form for the Brunswick units. The original NRC commitment date (12/30/90) for completing this project was missed. This project is now scheduled for completion at the end of December 1994 based on its relative priority to other projects. This project is related to B0019A, Design Basis Reconstitution.

### III. CONCLUSION

The DC Voltage Profile Study will proceed as scheduled to provide a basis for future modifications and safety evaluations of the DC electrical distribution system.

### IV. STATUS

This project was approved by management.

### V. TARGET COMPLETION

December 1994.

PROJECT MANAGER TERRY BOWMAN
PID G0017A

## INVESSEL CORE SPRAY PIPING REPAIR

### I. PURPOSE AND SCOPE

Plant Mod 91-043 installed stainless steel brackets across the top and bottom of the Loop A Core Spray Tee-box to piping header. The brackets were installed to provide strength to the headers in the event the existing crack grows to a length that could cause joint failure.

Seal welds are needed since the wetted crevice condition at the existing bracket welds could result in IGSCC of the welds. Exception number 1 to PM 91-043 was written to perform the following additional tasks:

1. Perform seal welds on brackets.
2. Perform liquid penetrant examination of the welds.

### II. EVALUATION

In letter NLS-91-303, CP&L provided the results of visual examinations of the invessel core spray piping and spargers for Unit 2, performed during the Reload 9 outage (B210R1). These inspections were performed in accordance with NRC Bulletin 80-13, dated May 12, 1980. This submittal also described repairs of a crack indication on the north core spray line.

The crack indication on the north core spray line was repaired by reinforcing the piping using underwater welding techniques to weld a bracket assembly to the core spray piping. The bracket assembly covers the cracked tee-box location and consists of an upper and lower bracket welded across the piping arms and tee-box. The brackets provide full structural integrity of the piping, even if the crack indication were to grow to 360 degrees. In addition, the bracket material and weld filler material are both resistant to intergranular stress corrosion cracking (IGSCC). Following the repair, a remote visual examination of the bracket welds was performed which assured the welds to be of acceptable quality for at least one cycle of operation. Since a vessel drain down was not performed, a liquid penetrant (LP) examination of the bracket welds could not be performed.

In the NLS-91-303 submittal, CP&L initially committed to perform an LP examination of the bracket assembly welds and application of seal welds to the bracket assemblies during the Unit 2 reload outage (B211R1). The seal welds are intended to eliminate the potential for crevice corrosion cracking developing under the brackets. In a Safety Evaluation dated January 14, 1994, the NRC concluded that this modification would maintain full structural integrity and support continued operability of the core spray line. With letters BSEP 93-0222 and BSEP 94-0042 CP&L has committed to complete the seal welds and liquid penetrant examinations during Unit 2 Outage B212R1.

### III. CONCLUSION

Carolina Power & Light Company has deferred LP examination of the bracket assembly welds and seal welding of the open ends of the brackets until the next Unit 2 reload outage (B212R1). The work is to be performed when the vessel is drained down for feedwater sparger replacement during the B212R1 outage.

### IV. STATUS

Outage B212R1 Project moved to 1996 implementation.

Project requires implementation phase approval by Plant Review Group.

### V. TARGET COMPLETION

May 1996.

PROJECT MANAGER CHUCK RAINES
PID G0024A

FEEDWATER SPARGER CRACKING ISSUE

## I. PURPOSE AND SCOPE

NUREG-0619 requires frequent non-destructive examination (NDE) of the feedwater (FW) nozzle blend radius regions and visual examination of the FW spargers to monitor potential crack growth in the vessel cladding. Both units are currently committed to examining the spargers every outage. As a result of such inspections, feedwater sparger cracking has been found.

The Unit 1 and Unit 2 sparger replacement scope includes removal and replacement of existing spargers, safe-ends, and portions of FW piping in the drywell. Both units will have the cladding removed from the FW nozzle blend radius regions. The spargers are cracking around the flow holes and around the circumferential welds which attach the sparger arms to the tee. During outages that are prior to sparger replacement, interim repairs may be performed to capture potential loose pieces in place. Prior to the interim repairs, as applicable, the regularly scheduled NDE will first be performed on the FW spargers, nozzle weld areas, and IGSCC susceptible weld joints. The success criteria for this project are the presence of no cracks (as determined by NDE/UT) and extended operation of both units without FW sparger problems. The safe-end replacement for Unit 2 will result in Unit 1 and Unit 2 having the same configuration. Also lessons learned during the Unit 1 replacement will enhance the Unit 2 replacement.

## II. EVALUATION

Schedule Index: 22 - Replacing the FW spargers is expected to reduce the potential for a breach of the reactor coolant pressure boundary (RCPB) and a loss of coolant accident (LOCA). The likelihood of breaching the RCPB and causing a LOCA event is based on nuclear grade piping having no pre-existing flaws exceeding allowable limits. Therefore, this initiative is assessed to have a significant impact to a moderately important system, the RCPB (0.5 x 32).

Additionally, this project is a plant enhancement; it provides marginally improved unit availability and results in some ALARA benefits. This modification would constitute a plant enhancement in that it would considerably reduce the maintenance and inspection requirements of NUREG-0619 on the FW nozzle inner blend radius (0.2 x 8). There is a increased potential for a significantly longer unit down time from failed FW spargers if they are not replaced. Therefore, unit availability is expected to improve (0.2 x 12). Also, reducing the frequency of liquid penetrant inspections of the feedwater nozzle blend radius would reduce by sixteen hours the outage critical path time required to perform the examination. Reducing the inspection requirements would represent significant man-rem savings, although the actual FW sparger replacement work would expend approximately 190 man-rem for each unit. Radiation dose for each in-vessel inspection is approximately 7.9 man-rem and, given the estimated reduction in the inspection frequency, when a savings of approximately twenty inspections is realized, a net ALARA savings would result (0.2 x 9).

Economic Aspects: The expected benefits of this modification will be derived through personnel radiation exposure reductions, net unit availability increase, and savings due to reduced maintenance and inspections. It is expected that the baseload cost of FW sparger maintenance and inspections will be significantly reduced after replacement.

Related Standards: This project impacts the Work Management Policy regarding material condition.

PID G0029A
Category I

Other Considerations: This modification can only be performed during a refueling outage, with a complete core offload. FW sparger replacement is scheduled for outages B110R1 and B212R1. These plans meet the NRC commitment dates. It is estimated that at least three weeks of outage critical-path time is required to replace FW spargers. Decontamination of FW piping and the vessel should be performed prior to work to reduce exposure during FW sparger replacement. Unit 2 spargers were procured in 1982 and are available for installation, (modification is required to accept new safe-end design). Unit 1 equipment needs to be ordered.

## III. CONCLUSION

Implementation of this project will reduce the frequency of inspections required by NUREG-0619. Unit reliability will be improved because of the reduced likelihood of FW sparger failure. There is a marginal benefit in ALARA savings and improved unit availability. However, the benefits are difficult to quantify. The July 1991 NRC commitment to evaluate the FW low flow controller evaluation per NUREG-0619 was met in June 1991.

## IV. STATUS

Project has been design phase approved by the Plant Review Group.

## V. TARGET COMPLETION

Unit 1, Outage B110R1.
Unit 2, Outage B212R1.

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|---|---|
| PROJECT MANAGER | CHUCK RAINES |
| PID | G0029A |

## DIESEL GENERATOR SERVICE WATER SUPPLY AND DISCHARGE PIPING REPLACEMENT

### I. PURPOSE AND SCOPE

In order to meet requirements resulting from NRC Generic Letter 89-13, CP&L has undertaken a number of initiatives regarding inspection and testing of service water piping and components. The service water lines for the diesel generator jacket water heat exchangers have a history of high maintenance due to piping through-wall leaks. These leaks result from cement lining failure at weak spots or from erosion and corrosion of the piping. Leaks, eroded welds, and missing cement lining indicate that the piping is in a degraded condition. The potential for this piping becoming inoperable is of significant concern because of the stringent operability requirements for the diesel generators, which require service water for cooling during operation. In order to eliminate high ongoing maintenance costs, CP&L has chosen to undertake a major program to replace large portions of the service water system piping with new piping to improve resistance to salt water corrosion and bio-fouling.

The purpose of this project is to replace the existing cement-lined carbon steel service water piping to and from the diesel generator jacket water heat exchangers with copper-nickel piping. Also this project will throttle service water flow to the diesels in order to balance flow to other equipment cooled by the service water system.

Successful completion of the proposed modifications would be evidenced by the absence of corrosion and through-wall leaks in system piping and improved cooling water flow to other system loads.

### II. EVALUATION

Schedule Index: 30 - Replacing the service water piping reduces maintenance and improves system reliability, thereby moderately improving the availability of the emergency diesel generators. Throttling of the service water flow to the diesels moderately increases the flow to other safety- related coolers and components that are served by the service water system while maintaining a significant margin of cooling flow to the emergency diesel generators. The result is a moderately positive impact on nuclear safety (0.5 x 32). Improved piping materials would reduce the maintenance required to maintain service water system availability and would prevent or minimize the potential for forced outages due to failures of the service water system or inoperability of the emergency diesel generators, resulting in a moderate impact on plant availability (0.5 x 12). Replacement of service water system piping would result in less frequent repair activities, more reliable system operation, and improved maintenance, providing a significant plant enhancement (1.0 x 8).

Economic Aspects: Analyses show that no significant cost savings are achieved by performing the installation in a dual-unit outage. The project reduces the probability of a forced dual-unit outage that might result due to service water unavailability impacting diesel generator operability. Long term costs will be reduced because improved piping materials will eliminate the increasing cost of inspection and repair caused by the deteriorating piping.

Related Standards: The Work Management Policy on material condition is applicable to this project.

Other Considerations: This project is an element of the Long Range Plan to significantly improve the reliability and performance of the service water system. It is also consistent with the Emergency Diesel Generator Enhancement Strategy goal to minimize out-of-service time and improve reliability. Installation must be performed during plant operation as well as over a series of outages.

In letter NLS-92-136, CP&L documented commitments from a meeting with NRC on May 12, 1992, and

answered questions from an NRC letter dated April 27, 1992. Commitment number 15 from enclosure 4 of NLS-92-136 was given in response to the NRC question.

## III. CONCLUSION

To meet established commitments, this project will be completed as scheduled. This project is an element of the Long Range Plan for the service water system and is consistent with the Emergency Diesel Generator Enhancement Strategy goals.

## IV. STATUS

This project has been implentation phase approved by the Plant Review Group.

## V. TARGET COMPLETION

Plant Mod 91-070 - December 1995
Plant Mod 91-071 - December 1995
Plant Mod 91-072 - December 1996

PROJECT MGR. CHRIS HUGHES
PID G0050J

SCAM MODULES AND STEAM LEAK DETECTION SYSTEM UPGRADE

## I. PURPOSE AND SCOPE

The purpose of this project is to replace the Riley instrumentation for the high pressure coolant injection (HPCI), reactor core isolation cooling (RCIC), reactor water cleanup (RWCU), and residual heat removal (RHR) steam leak detection systems (LDS) with NUMAC instrumentation. Also the project will replace fifteen local Fenwal temperature switches with thermocouples that connect to NUMAC. In addition, GEMAC flow instrumentation in the RWCU system will be replaced with NUMAC instrumentation. Currently, the HPCI, RHR, RCIC, and RWCU systems are subject to spurious isolations caused by their associated Riley-based steam leak detection instrumentation (SCAM Modules). These spurious isolations have been a source of numerous licensee event reports (LERs) at BNP. With the replacement of the GEMAC and Riley-based instrumentation with NUMAC instrumentation, it is anticipated that spurious isolations of these systems will significantly decrease because of more reliable, accurate, and redundant instrumentation.

The success criterion of this modification will be a reduction in the LERs caused by spurious isolations during the subsequent operating cycles. Also the design will ensure that the installed configuration will meet operability requirements, trip setpoints and allowable values, and isolation response times in Technical Specification Tables 3.3.2-1 through 3.3.2-3 for RWCU, HPCI, and RCIC isolation instrumentation.

## II. EVALUATION

Schedule Index: 29 - The principal impact of this project is with regard to industrial safety. Currently, technicians must conduct surveillance testing of LDS sensors at (in some cases) difficult to reach locations, risking injury from hot pipes as well as from potential falls. Implementing this project will eliminate these potential lost-time accidents by allowing complete surveillance testing at the instrumentation panels rather than requiring access to the sensors (0.5 x 29). Also, use of the more reliable NUMAC instrumentation will reduce spurious RWCU, HPCI, RHR, and RCIC isolations that have routinely occurred with the old instrumentation. The availability of these systems will moderately improve, and challenges to safety systems such as HPCI will be significantly reduced. Therefore, there will be a moderate improvement in nuclear safety (0.2 x 32). This project contributes to the improvement in operations of the power plant by eliminating spurious system isolations that distract operators from other duties. Also, the operator interface is much improved with added LDS indication capability and reliability, and surveillance requirements are simplified. Therefore, this project is a significant plant enhancement (0.5 x 8). The improvement in the reliability of the RWCU differential flow instrumentation will reduce the number of RWCU isolations which have previously delayed a unit's return to service and unit availability(0.2 x 12). Finally, net dose savings would be realized from reduced maintenance and surveillance testing (0.2 x 9).

Economic Aspects: The economic benefits of this project include reduced system troubleshooting and maintenance and more efficient use of human resources because the LDS will be more reliable and will require less effort to perform surveillances. The increased reliability will result in fewer spurious isolations and, thus, fewer LERs that need to be processed. Routine LDS costs are expected to be lower.

Related Standards: The Work Management Policies applicable to this project are maintaining safety system material condition and operating parameters. This reliability upgrade will significantly improve the material condition of systems affected by the LDS, avoiding spurious isolations and unnecessary component wear. It will also aid in operating the plant in accordance with the Technical Specifications and reduce the number of LCOs entered as a result of spurious system isolations and trips. The modified system will be more operator friendly, with a higher quality human-factors interface (better indications) and higher tolerance for human error (redundant and self-test features).

Other Considerations: Implementation of this project must be performed during an outage. The NUMAC instrumentation design might allow for some surveillance relaxation due to its self-test features. The original NRC commitment date (12/31/90) for completing this project was missed. This project has been scheduled for completion at the end of the next refueling outages (B109R1 and B211R1).

## III. CONCLUSION

This project will improve the LDS operability and reliability. It will also improve the availability of the RCIC, HPCI, RWCU, and RHR systems due to reduced spurious isolations originating from the LDS. The evaluation received a moderate personnel/public safety benefit, a low to moderate nuclear safety benefit, and a moderate plant enhancement benefit. The project has many positive attributes and shall be implemented during the next refueling outages based on its expected benefits to many of the site organizations, including operations, maintenance, and instrumentation and controls.

## IV. STATUS

Unit 1 - Project complete.
The Unit 2 project has been implementation phase approved by the Plant Review Group.

## V. TARGET COMPLETION

Unit 1 - Complete.
Unit 2 - May 1994.

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| PROJECT MANAGER | CRAIG MARCH |
| PID | G0051A |

## FUEL POOL GIRDER TENDON IN-SERVICE INSPECTION

### I. PURPOSE AND SCOPE

Each of the four spent fuel pool girders contains twelve pairs of post-tensioned tendons that serve as primary tension reinforcement for the girders. This project resulted from an NRC inspection report item that has been closed, but further work was initiated to address long term BNP inspection requirements for the fuel pool girders. Potential problem areas to be addressed include:

- loss of pre-stress force of the fuel pool girder tendons,

- loss of grease from the tendon anchorage grease caps, and

- corrosion of girder tendons.

More specifically, this project is to evaluate the long-term capacity of the girders as a result of the installation of high density fuel racks in the fuel pool, the effects of fuel pool water temperature on the material properties of the tendon wires, the potential for corrosion, and the effects of cyclical loading. The information previously available (i.e., design calculations, specifications, and industry literature) did not indicate that design margins were reduced or compromised; however, there are unknowns that could not be addressed by analysis. Nevertheless, it is felt that the important unknowns will not impact the design margin to current standards. At present, there is no inspection program for fuel pool girders.

The scope of this project involves writing and implementing a specification and procedure to inspect a percentage of the tendon sample wires, samples of tendon lubricant, and visible areas of girder concrete. Tendon sample wires will be sent to the Harris Energy & Environmental Center for testing and analysis. Upon completion of inspection and testing, data analysis will be done. It is anticipated that a routine inspection and testing program with a periodicity of three to five years will be put in place following the analysis.

This project will initially be considered successful when the fuel pool girder tendon inspection requirements have been identified in the short term and the immediate inspections and adjustments have been implemented. The long term success of this project will be dependent on the ability of the inspection program to control the tendon material condition and to anticipate problems.

### II. EVALUATION

Schedule Index: 15 - This inspection and testing project is not expected to affect nuclear safety (0 x 32). Without the inspection and testing to verify the design basis assumptions for the pool with high density storage racks, there may be personnel safety implications from the potential degradation of the fuel pool support girder strength (0.5 x 29). Also, since the original design assumptions could potentially be no longer appropriate and in need of correction, this project represents a plant enhancement (0.2 x 8).

Economic Aspects: There is no direct economic gain from this inspection and testing program. The project expenditure is a charge for economic-loss risk reduction. If a degraded condition is found upon inspection and testing, correcting the problem early could save many times the inspection and testing cost by avoiding expensive repairs.

Related Standards: This project impacts Work Management Policies for material condition and for management oversight and corrective actions. The inspection and testing is in line with the standard to ensure that adverse conditions, excluding those that are self revealing, shall be self identified an average of 90% of the time.

Other Considerations: The original NRC commitment date for completion of this project, December 31, 1986, was not met. The effort is now scheduled for completion by December 31, 1995.

## III. CONCLUSION

Because this project yields a significant benefit in economic-loss risk reduction, it will be accomplished as scheduled.

## IV. STATUS

Project has been implementation phase approved by the Plant Review Group.

## V. TARGET COMPLETION

July 1995

PROJECT MGR. CHRIS HUGHES
PID G0096A

## ELECTRICAL DISTRIBUTION SYSTEM ADEQUACY/GDC-17

### I. PURPOSE AND SCOPE

As part of the Integrated Action Plan (IAP) that responded to the NRC Diagnostic Evaluation Team (DET) report of September 1989, Item D1 provided for a re-evaluation of the Brunswick electrical distribution system for compliance with 10 CFR 50, Appendix A, General Design Criterion 17 (GDC-17). This criterion requires that the plant emergency systems be able to respond to a loss of coolant accident and a coincident loss of all on site sources of AC power by having one source of off site electrical power immediately available. Also required is a second source of off site power that would be available in time to preclude exceeding fuel thermal limits. For Brunswick, this first source of off site power to each unit is provided through the respective startup auxiliary transformer (SAT). The second source of off site power is provided by back feeding through the unit auxiliary transformer (UAT), which takes several hours to accomplish. BNP and the NRC have agreed that BNP should enhance the off-site electrical distribution system to meet the current interpretation of GDC-17. This enhancement requires a faster way of providing the second off site source if needed.

In addition to GDC-17 compliance, additional concerns being addressed for the AC electrical distribution system include long term adequacy of switchyard voltage to meet emergency bus voltage requirements, and investigation into improving emergency diesel generator (EDG) Technical Specification (Tech Spec) restrictions through enhancements, which may include an additional on site emergency power source. Also the non-segregated bus ducts for each unit's existing SAT Y-windings will be upgraded to meet current system ampacity requirements.

Successful completion of G0110A will result in electrical distribution system design alternatives that meet the current interpretation of GDC-17.

### II. EVALUATION

The study has resulted in three projects for each Unit, now in various phases of design and implementation. The three projects are; the replacement of the SAT-Y Winding non segregated bus duct with higher ampacity equipment, the installation of the Generator No Load Disconnect Switches to enhance the electrical distribution system to meet the current requirements of GDC-17 and the installation of Voltage Regulators to control the E Bus Voltage Level under conditions of heavy Grid load.

### III. CONCLUSION

The studies have resulted in the following actions:

A. Installation of the Non Segregated Bus Duct in 1994 (Unit 2) and 1995 (Unit 1).

B. Design is in progress for the Generator No Load Disconnect Switch for installation in 1995 for Unit 1 and 1996 for Unit 2 . This installation includes logic changes to simplify the process of moving into UAT backfeed. This work will result in an enhanced electrical distribution system that meets the current interpretations of GDC-17.

C. Authorization is being requested to begin Design for Voltage Regulators to control E Bus Voltage Levels for installation completion in 1997 (Unit 2) and 1998 (Unit 1) to conform with the system load forecast. This addresses the issue of the long term adequacy of Switchyard Voltage to meet E bus voltage requirements.

D. The study to explore the alternative of adding an additional on site emergency power source is continuing with completion expected by July of 1994.

PID G0110A
Category I

## IV. STATUS

The parts of this overall project are in various stages of approval through the Plant Review Group.

## V. TARGET COMPLETION

| | | | |
|---|---|---|---|
| PCN G0110B | 1994 | Unit 2 | Non Seg Bus Duct Replacement |
| PCN G0110C | 1995 | Unit 1 | Non Seg Bus Duct Replacement |
| PCN G0110F | 1995 | Unit 1 | Generator NLDS |
| PCN G0110G | 1996 | Unit 2 | Generator NLDS |
| PCN G0110H | 1998 | Unit 1 | Voltage Regulators |
| PCN G0110I | 1997 | Unit 2 | Voltage Regulators |
| PCN G0110D | 1994 | Unit 1/2 | Fifth Diesel Study |

PROJECT MANAGER DAN MOORE
PID G0110A

## UPGRADE SECURITY COMPUTER AND CARD READER

### I. PURPOSE AND SCOPE

Most of the equipment that makes up the Brunswick security system has been in place since original plant construction. Developments in the design and use of such equipment have evolved such that new equipment and systems are available which provide higher reliability and would substantially reduce the types of failures currently experienced. These failures result in potential security problems and require large amounts of resources to compensate and correct. Additionally, the unique design of the Brunswick system is no longer fully supported by the original vendor. Because failures can affect large portions of the security system and because troubleshooting must currently be done at the component level, failures can have a large effect on plant access. This represents an economic risk should failures occur during busy outage periods. Failures could require additional manning of access points.

The upgraded system equipment selection has been finalized with system hardware and software design currently in progress. The Security Access Control system is being upgraded with replacement of the security host computers, consoles, multiplexors, and card readers. The upgrades will consist of industry standard fault tolerant computers communicating to distributed intelligence multiplexors via high speed fiber optic communication links. A majority of the fiber optic cables, planned for and pulled during previous security modifications, will be used for the multiplexor communication link. During installation of the multiplexors and the monitored devices, security compensatory guard personnel will be required. New access cards will be prepared on the upgraded Polariod Photo ID system for all badged personnel. Additionally, training of computer, maintenance, and security personnel will be required.

System performance, maintenance, spare parts availability, and the reduced reliance on contractor software support will greatly improve the security system. Following installation and an initial trial period, reportable events due to failures of the card reader access control subsystem should decrease to less than one third of that of the three previous years.

### II. EVALUATION

Schedule Index: 8 - This project should have no appreciable effect on nuclear safety, personnel safety, unit availability, unit capacity, or ALARA. A high plant enhancement scaling factor is assigned because the expected reduction in security events and reduced nuisance to all badged personnel will result in higher system reliability (1.0 x 8).

Economic Aspects: Increased security system reliability and reduced maintenance and procurement effort for individual repair and routine activities should result. Reliance on contractors for software support will be eliminated. Security, technical, and computer software staff time, along with management attention following failure events, should be significantly reduced. The nuisance impact of access control failures and security events on all badged personnel should decrease.

Related Standards: The applicable Work Management Policy is material condition.

Other Considerations: On the most recent NRC Systematic Assessment of Licensee Performance (SALP), Brunswick was upgraded from a "2" to a "1" in the security area. A verbal commitment has been made to the NRC to implement upgrades to the card readers by December 1994.

### III. CONCLUSION

Although the schedule index is relatively low, this project is important. Failure of the card reader control subsystem could have a major impact on plant access and require expensive and labor intensive compensatory action.

## IV. STATUS

Project has been implementation phase approved by the Plant Review Group.

## V. TARGET COMPLETION

April 1995

PROJECT MGR. LARRY WALTON
PID G0140A

## PROVIDE CAD SUBSYSTEM DIVISIONAL SEPARATION

### I. PURPOSE AND SCOPE

Wiring and cables for containment isolation valves for the containment atmosphere control/containment atmosphere dilution (CAC/CAD) subsystem are not divisionally separated as required by the FSAR and design requirements, including GDC-41. The present condition affects nuclear safety because certain CAC/CAD containment isolation valves cannot be operated to vent the containment if one division of electrical power is lost. This project studied alternatives and options to resolve the deficiencies with divisional separation, yet retain the ability to vent the containment under post-accident conditions. Resolution was complicated by Generic Letter 89016, which required plants to have improved venting capabilities.

The recommended solution is to resolve the divisional separation problems with new cabling and physical barriers and to maintain alternate venting capabilities by installing a suppression pool vent path that will allow venting in the event either division of electrical power is lost. This suppression pool vent path will use piping installed as part of the hardened wetwell vent project (G0106A).

Successful completion of this project will be indicated by complete divisional separation of electrical power to the containment isolation valves for the containment atmosphere dilution subsystem of the CAC, along with retention of the ability to vent the containment by means of installing a separate vent path that also meets the requirements for electrical and physical separation.

### II. EVALUATION

Schedule Index: 9 - Improving the redundancy and separation of the electrical power for certain valves associated with venting containment provides additional assurance of system operation during post- accident conditions and provides some degree of nuclear safety benefit. (0.2 x 32). The proposed modifications provide plant enhancement benefits by assuring compliance with specified criteria and by improving reliability and assurance of performance (0.5 x 8). A minor negative impact on ALARA results from the exposure incurred in installation (-0.2 x 9).

Economic Aspects: This project has no long term economic impacts after the modifications are implemented.

Related Standards: The Work Management Policy on material condition is applicable to this project.

Other Considerations: The proposed modifications will be integrated and coordinated with the hardened wetwell vent project (G0106A), since that project installs a new valve integral to providing the alternate vent path. The deficiencies were originally reported to the NRC in August, 1990 in Licensee Event Report 90-013. CP&L committed to complete corrective actions in outages B109R1 for Unit 1 and in B210R1 for Unit 2. The Unit 1 implementation was completed as scheduled; however, the Unit 2 commitment date was not met, and a supplement to LER 90-013 was prepared. Implementation of the separation modification for Unit 2 is in progress as scheduled within outage B211R1.

### III. CONCLUSION

Maintaining electrical and physical separation is important to assuring that safety-related equipment is reliably powered and is capable of performing its functions when required. Assuring that these requirements are met for containment isolation valves is important from a system safety and reliability standpoint. Therefore, this project will be completed as scheduled for implementation.

**PID G0156A**
**Category I**

## IV. STATUS

Project has been implementation phase approved by the Plant Review Group. Unit 1 implementation completed; Unit 2 implementation is in progress; scheduled completion during B211R1.

## V. TARGET COMPLETION

June 1994

PROJECT MGR. LARRY WALTON
PID G0156A

## PROVIDE THERMAL OVERLOAD PROTECTION FOR AC MOTOR OPERATED VALVES

### I. PURPOSE AND SCOPE

Thermal overload protection for valve actuator motors addresses one part of the overall program to upgrade the operational reliability of motor operated valves (MOV). Thermal overloads are used to protect the actuator motors from excessive electrical current, especially in the case where the MOV is stuck (either shut or open) and the motor does not have enough power to overcome the problem. Without thermal overload protection, when the valve is stuck, the motor starting currents remain high, severely damaging the motor windings and making manual operation of the valve the only option.

The basis for not using thermal overload protection was the assumption that the use of protective devices (such as thermal overloads) having the capability to interrupt power to safety-related valves would increase the risk that the valves would not operate during accident conditions, assuming the protective devices themselves might malfunction and prevent valve operation. It was considered better to let a motor destroy itself while attempting to operate the valve. The current industry approach and NRC guidance (NUREG 1296, "Thermal Overload Protection for Electric Motors on Safety-Related Motor-Operated Valves") is to assure that motor overload protection is set and maintained in a manner that assures motor-winding protection and, also, avoids spurious valve operation. This approach allows resetting of electrical breakers and thus, allows another attempt by operating personnel to reposition the valve after the condition causing the stuck valve is corrected.

This project is primarily to install thermal overload protection for motor operated valve AC motors and to replace motor control cabinet breakers which have reached their environmental qualification end of life. To support this project, collateral engineering work is needed to assure setpoint consistency and breaker coordination among the approximately 125 MOVs per unit. Also, once the new setpoints are established, recalculation of the corresponding torque values is required for each valve actuator in order to assure that the valve can be operated under all design conditions without causing spurious thermal overload actuations. All of the affected safety related MOVs and the associated breakers were identified using the Equipment Data Base System, assuring coverage of all of the applicable safety equipment. Examples of systems affected by this project include core spray (CSS), high pressure coolant injection (HPCI), reactor core isolation cooling (RCIC), reactor water cleanup (RWC), reactor building closed cooling water (RBCCW), standby gas treatment (SGT), main steam (MS), and containment atmospheric control (CAC).

This project will be successful when the operational reliability of MOVs improves and valve actuator motors are no longer damaged under stuck-valve (stalled-motor) conditions.

### II. EVALUATION

Schedule Index: 28 - This project is directly related to assuring the availability of several safety systems, including residual heat removal, service water, main steam, core spray, high pressure coolant injection, and reactor core isolation cooling (0.5 x 32). Since it has been determined that lack of overload protection has probably resulted in higher MOV motor failure rates at BSEP, this condition has most likely indirectly contributed to plant outages in the past. Consequently, unit availability is enhanced (0.5 x 12) through increased operational reliability of most of the safety-related MOVs. Likewise, this project provides potential plant enhancements (0.5 x 8) by reducing the level of corrective maintenance, post-maintenance testing, and MOV troubleshooting required for a large number of safety-related valves. This is particularly important due to the high impact such work has on outages. Finally, although the project itself will require some additional exposure to radiation during its implementation, reduced levels of MOV inspection, troubleshooting, and maintenance over the rest of the life of the plant are expected to compensate for this (0.2 x 9).

PID M0121E
Category I

Economic Aspects: Improved plant availability and fewer actuator motor replacements are expected to compensate for the cost of this project. No long term additional costs are anticipated as a result of this project for maintenance except routine preventive maintenance.

Related Standards: This project directly is related to the Work Management Policy for material condition.

Other Considerations: The remaining thermal overload work will be accomplished before the completion of outages B110R1 and B212R1 to fulfill CP&L's commitments to the NRC. Also, this project is related to M0121O, MOV Testing, which is a long term effort and does not directly impact the M0121E thermal overload work.

## III. CONCLUSION

This project will be completed as scheduled during outages B110R1 and B212R1.

## IV. STATUS

The Unit 2 projects for B211 have been implementation phase approved by the Plant Review Group. The Unit 1 and 2 projects require implementation phase approval by the Plant Review Group for future outage scope.

## V. TARGET COMPLETION

May 1996

| | |
|---|---|
| PROJECT MGR. | LARRY WALTON |
| PID | M0121E |

## MATERIAL CONDITION WALKDOWN

### I. PURPOSE AND SCOPE

The purpose of this project is to identify, categorize, and repair plant material discrepancies not being addressed under other projects. Under this project, approximately 2000 discrepancies were identified during plant walkdowns. A list of detailed walkdown items in plant locations that are high radiation areas during plant operation (hot side) and a list of walkdown items in all other normally accessible areas (cold side) have been developed. The plant material discrepancies on these lists have been further categorized, and the appropriate corrective actions will be taken. The plant's Technical Support Group and the Nuclear Engineering Department have evaluated and categorized all of the walkdown items. The largest segment of items is related to conduit and structural supports. Other discrepancies include mechanical maintenance items, fire hazards, and housekeeping issues. Some of the discrepancies can be resolved directly under the routine work request process. Those discrepancies requiring design and/or documentation changes are being accomplished under this project or under other appropriate projects such as PID B0014A, Emergent Structure Repair. The success criteria of this project are elevated inspection and material condition standards for the plant.

### II. EVALUATION

Schedule Index: 17 - Walkdowns have identified discrepancies that could affect plant safety-related systems. Some of the approximately 2000 items may be operability concerns for safety-related systems. For example, some of the discrepancies are cable tray and conduit supports for class 1E systems. Also, feedwater heater support problems were identified during the walkdowns. Therefore, this project has a positive effect on nuclear safety (0.2 x 32). During the comprehensive walkdowns, industrial safety deficiencies (including some fire hazards) were identified; correction of these will result in improved personnel safety (0.2 x 29). Raising the standard of the plant's comprehensive walkdown inspection program is an important contributor to upgrading and maintaining the material condition of the nuclear plant - a plant enhancement (0.5 x 8). Finally, performing the walkdowns will result in a person-rem expenditure with no future person-rem savings projected (0.2 x 9). The net expected benefits of this program are not readily quantifiable.

Related Standards: The applicable Work Management Policies are those for management oversight and corrective actions, material condition, and housekeeping.

Other Considerations: This project augments the periodic inspections required by Administrative Instructions AI 96, "Drywell Inspection and PNSC Outage Prestartup Checklist Instruction," and AI 114, "Management Field Walkdowns."

### III. CONCLUSION

This project provides a process for identifying and resolving plant material discrepancies. This project was initiated during the B108F9 and B210F6 outages and will continue until all identified walkdown work not covered by other projects is completed.

### IV. STATUS

This project has been implementation phase approved by the Plant Review Group.

### V. TARGET COMPLETION

December 1994.

PROJECT MANAGER STUART BYRD
PID P0057E

HVAC UPGRADE

## I. PURPOSE AND SCOPE

There are currently numerous open work items for the heating, ventilation, and air conditioning (HVAC) systems at Brunswick. Of these items, the highest priority work pertains to HVAC material upgrades in the Reactor Building and in the Control Building. Noteworthy examples of material conditions requiring resolution under the scope of this project are listed below:

Approximately 200 feet of ductwork in (100 feet in each Reactor Building) is corroded beyond repair. The corroded ductwork is located in the overhead area of the 20 feet elevation. This corrosion is caused by continual condensation. This duct requires replacement and insulation to preclude future condensation and corrosion. Also, many of the HVAC duct supports are either bent, missing, or loose.

The Control Building intake plenum base is corroded through wall in several places.

The Control Building supply and return roll filters (sitewide) do not work properly and have to be manually advanced. Excessive leakage of unfiltered air occurs due to corroded media frames.

The Reactor Building supply fan vortex dampers are corroded and obsolete. This corrosion has caused damper binding and has tripped HVAC. The supply fan discharge dampers have no rubber seals, therefore backflow through idle fan causes reverse rotation of fan blades and a possible fan breaker trip could result when the fan is started.

Successful completion of this project will result in increased HVAC system efficiency and reliability.

## II. EVALUATION

Schedule Index: 15 - Upgrading the material condition of HVAC systems at Brunswick will be a significant plant enhancement (1.0 x 8). Concerning nuclear safety, HVAC systems are modeled in the PRA. Failure of individual HVAC systems have the potential to fail plant systems. Individual system failures are generally not significant with respect to mitigation of accidents; however, the cumulative effects of the degradation of HVAC systems could result in a negative effect on nuclear safety. It is, therefore, judged that this project will result in an overall low positive effect on nuclear safety (0.2 x 32). HVAC systems in general provide support functions for many plant systems. The inability to cool certain plant areas, particularly the Reactor Building, could result in a loss of unit generation. During the summer months when the temperatures in the Reactor Building are elevated and a loss of Reactor Building ventilation occurs, a potential threat exists for a PCIS Group 1 isolation on high temperature in the MSIV pit. Additionally, cooling components for safety-related equipment (i.e., RHR Room Coolers) have a potential to place the plant in restrictive LCOs. Therefore, this project has a low positive impact on unit availability (0.2 x 12). This project would therefore result in a low negative scaling factor for ALARA (-0.2 x 9).

Economic Aspects: The cost of this project will be offset by reduced long-term HVAC maintenance costs and longer, more reliable operation of systems cooled by these HVAC systems.

Related Standards: This project is primarily related to the Work Management Policy for material condition. This project will bring HVAC systems up to design conditions and ensure long-term reliability.

Other Considerations: There is an NRC commitment associated with a portion of this project - to complete the development of DR 90-0143 related to vortex dampers in the Reactor Building by December 31, 1992. The DR will be completed on the committed schedule.

## III. CONCLUSION

Work is complete on the 200 feet of the reactor building duct work in both units. Control building intake plenum is in implementation. Parts are on site. Roll filters are being replaced with pleated cartridge filters and is approximately 50% complete. The reactor building supply vortex and isolation dampers are being replaced. Design and procurement is complete.

## IV. STATUS

This project is implementation phase approved by the Plant Review Group.

## V. TARGET COMPLETION

December 1995.

PROJECT MANAGER HOWARD LINDSEY

SIMULATOR CORE-THERMAL MODEL UPGRADE

## I. PURPOSE AND SCOPE

Replace the existing simulator core-thermal software model to improve training on core and vessel dynamics during start-up, transient, and accident conditions.

## II. EVALUATION

The current simulator core-thermal model was developed for the existing ENCORE computer. The computation limitations of the ENCORE required a compromise in simulation accuracy and computer execution time requirements. This limits the accuracy and degree of training on many core and thermal conditions.

## III. CONCLUSION

The approved simulator computer upgrade to a current technology SGI Challenge computer greatly reduces the required compromise on execution time. This permits an upgraded core-thermal model which improves training in several areas:

A. Nuclear instrumentation response during startup training; steady state and transient response during simulation of accident conditions; containment and radiation monitoring system performance under degraded core conditions; recirculation pump start transient and start logic failures; and provides for realistic demonstration of thermal stratification during low flow conditions.

B. New capabilities have been added: Modeling of Boron stratification allows for demonstration of EOP guidelines for boron injection during ATWS conditions; addition of recirculation pump and jet pump cavitation; and permits modeling of individual instrument reference legs allowing for simulation of reference leg flashing, out-gassing, reference leg refill; and pressurization of reference leg with mis-operation of reference leg backfill system.

## IV. STATUS

Project requires implementation phase approval by the Plant Review Group.

## V. TARGET COMPLETION

June 1995.

PROJECT MANAGER WILLIAM GEISE
PID

FAIM 10000454
Category II

## SIMULATOR INSTRUCTOR STATION/COMPUTER UPGRADE

### I. PURPOSE AND SCOPE

Replace the 8 year old Encore computer with a current technology SGI Challenge computer to improve simulator reliability.

Add 6 instructor stations/ work stations to replace the 13 year old instructor station and provide independent means of development, testing, and instructing, without interfering with training on the main simulator.

### II. EVALUATION

The outdated simulator computer system failures interrupt training and examinations

Increased training demand usage has resulted in limited accessibility for scenario development, maintenance and certification testing.

### III. CONCLUSION

An upgrade of the simulator computer to current technology, and the addition of extra instructor stations will address the problems above plus provide other benefits:

A. Reduce reliance on contractor support

B. Potential for API reduction in 1995/1996 time frame

C. New enhanced user-friendly instructor system will enable cross training of more instructors.

### IV. STATUS

Project has been approved for implementation by management.

Simulator outage is scheduled for November/December 1994 to enable installation and testing.

### V. TARGET COMPLETION

December 24, 1994.

PROJECT MANAGER WILLIAM GEISE
PID

FAIM 10000453
Category II

TURBINE ROTOR REPLACEMENT

## I. PURPOSE AND SCOPE

The purpose of this project is to upgrade the turbine and other turbine related equipment. These changes include new LP-A and LP-B monoblock rotors on Unit 1 and LP-A on Unit 2, full flow duplex oil filters, piggy back turning gear motor, reactor feedpump turbine woodward governor, auxiliary oil pump, and vapor extractor and insulated coupling.

## II. EVALUATION

The rotor replacement extends the life of the turbine and potentially reduce the turbine valve testing frequency. The turbine upgrade is intended to improve the reliability and performance of the units.

## III. CONCLUSION

CP&L will install the monoblock rotors and study other equipment upgrades.

## IV. STATUS

Project has been study phase approved by the Plant Review Group.

## V. TARGET COMPLETION

December 1996.

PROJECT MANAGER PATRICK GAINES
PID

FAIM 10000621
Category II

PROCESS COMPUTER REPLACEMENT

## I. PURPOSE AND SCOPE

Brunswick's Honeywell 4010 process computers are the oldest installed and functioning reactor core monitoring computers in the United States. They were designed with technology which has become outdated and cannot be readily supported by the manufacturer. Also, technician training services and spare parts are no longer provided by Honeywell. Spare parts can be obtained at this time from third party sources; however, supplies are subject to depletion without notice. Although the many computer outages have not yet impacted the associated unit generation, their frequency has been rising, increasing the probability of startup delays or shutdowns.

The process computer's primary function, core monitoring, is currently dependent on and limited by the existing P1 software provided only by General Electric Corporation (GE). This software is less versatile and accurate than the variety of software now being written for DEC VAX (versus Honeywell) computers. In addition, limitations in fuel vendor selection are caused by the core monitoring software being GE-specific and less efficient than other available software. These fuel vendor limitations are considered to be a major disadvantage of the present system. In addition, as more complex fuel is used in the reactor core, it becomes increasingly difficult to predict the effects of core power adjustments, resulting in slower reactor startups and power adjustments than would be possible with a more capable system. The existing process computer system does not have sufficient capacity to accommodate the upgraded software needed.

The basic scope of the plant process computer replacement (PPCR) project is to transfer the functions currently being performed by the existing process computer to a system that has greater hardware/software capability, expansion capability, reliability, and maintainability. The existing process computer functions will be upgraded to perform more advanced computing and monitoring using the latest computer graphic capabilities. The new hardware includes front-end data acquisition equipment, data links, high speed DEC network interfaces to existing VAX computers, additional VAX systems, special purpose interfaces for the existing plant data system, and new operator consoles. Only the existing Honeywell input/output (I/O) cabinets will remain, serving as the interface between the plant sensors and the new data acquisition system. The new software includes the CPU's operating system licenses, data acquisition and data validation software, new core monitoring software, applications specific software, and system integration software that coordinates and monitors the entire system. Engineering services to support this project include providing documentation, testing, installation, training, conversion planning, and project management. The testing and evaluation phase for the new system is extensive. After the new system's operation has been adequately verified, the existing Honeywell 4010 computer will be disconnected and removed using a phased approach. A long list of goals and success criteria have been established to confirm the adequacy of the new system. Abandonment and/or removal of the Honeywell process components will be a major milestone to indicate that important goals are being satisfied.

## II. EVALUATION

Schedule Index: 13 - The process computer replacement is considered a non-safety related modification. Although it can be argued that the equipment is not safety related, the dependence of operators on the system output may have safety implications during operation. It is reasonable to predict that the graphic display benefits and predictive capability of the new system (especially as related to secondary plant process parameters) will reduce the frequency of secondary plant event sequence initiators (such as low condenser vacuum) relative to the frequency values considered in the PRA (0.2 x 32). The reliability, availability, and maintainability of the new system is expected to be much better than the previous system. As time goes on, the probability of unit downtime or startup delays increases with the old system (0.2 x 12). The

computer replacement is viewed as a significant enhancement for the personnel who need to use it, resulting in a plant enhancement (0.5 x 8).

Economic Aspects: The current 20 year old computer system can not last much longer without support from the vendor, so investment in a replacement is inevitable. The largest probable economic benefit is that the new system is much less likely to delay return to service after a refueling outage because of process computer system failures. It has been estimated that such a failure would result in a one to seven day increase in startup time. Also important is that the new core monitoring software, which will not run on the old computer, will permit CP&L to purchase fuel from more than one nuclear fuel supplier, enhancing competitive pricing. Finally, upon project completion, long-term system maintenance costs are expected to be reduced somewhat due to the increased availability of spare parts.

Related Standards: This project is related to Work Management Policies for material condition, operating parameters, and management oversight and corrective action. The PPCR project will improve the reliability, availability, and maintainability of the process computer systems, allowing better operational control.

Other Considerations: Other improvements in the ability of operators to monitor and tune the operation of the plant require the installation of the new process computer system. It is anticipated that there will be measurable improvement in plant availability and net generation as a result of these additional enhancements.

## III. CONCLUSION

Unit 1 Process Computer System replacement has been accomplished, with Availability Runs in progress. The installation of the Unit 2 system is in progress and currently on schedule. The process computer replacement will result in improved plant availability and allow better operational control.

## IV. STATUS

This project is implementation phase approved by Plant Review Group.

## V. TARGET COMPLETION

June 1994

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|---|---|
| PROJECT MANAGER | LARRY WALTON |
| PID | 01757A |

**REPLACE SHAFT DRIVEN OIL PUMP FOR REACTOR FEEDPUMP TURBINE WITH MOTOR DRIVEN PUMP(S)**

## I. PURPOSE AND SCOPE

This project is to assess and implement the installation of redundant oil pumps for the reactor feedwater pump turbines (RFPT). The RFPT main shaft driven oil pumps have been unreliable, with limited operating range, and have had a difficult and expensive repair and maintenance history. Due to the unreliable operation of the RFPT main shaft driven oil pumps, a single RFPT motor driven auxiliary oil pump must be continuously operated to maintain RFPT oil system pressure requirements. The recent failure of a single RFPT auxiliary oil pump resulted in the loss of over $100,000 in generating revenue (18 hours of reduced power). The recommendation to correct this problem involves adding one new motor driven pump with the current auxiliary pump. This project will be successful if the corrective action will improve plant availability and plant capacity and will reduce maintenance requirements for the RFPTs.

## II. EVALUATION

Schedule Index: 30 - The prevention of power reductions due to failures in the present RFPT system and lost generation time will increase the unit capacity (1.0 x 10). The plant will also be enhanced by the improved maintenance and lower repair costs for the proposed upgrade to the RFPT oil pumps (1.0 x 8). Nuclear safety is somewhat improved with a more reliable feedwater system which will reduce the potential for a loss of feedwater transient (0.2 x 32). The addition of the motor driven auxiliary oil pumps for the RFPTs could prevent previous unit power reductions associated with the present system thus increasing unit availability (0.5 x 12).

Economic Aspects: The economics of replacing a difficult and expensive to maintain RFPT main shaft driven oil system with a more reliable and easier to maintain system are positive. Besides the savings in maintenance, there is also a savings in generating capacity with increased reactor feedwater reliability. Just one failure of the RFPT auxiliary oil system cost 18 hours of reduced generating capacity or $100,000 of lost revenue. The cost of upgrading both units could be economically justified with the prevention of potential lost generating revenue over the balance of plant life. Long term maintenance costs would be reduced relative to the present RFPT oil system.

Related Standards: Replacing the RFPT oil pumps with a more reliable system would meet the Work Management Policy on material condition. This policy is met by maintaining and improving the reliability and productivity of the Brunswick Nuclear Plant with a more reliable reactor feedwater system.

Other Considerations: Because this project requires the reactor feedwater system to be inoperable for the replacement of the RFPT oil pumps the work would have to be performed during an outage.

## III. CONCLUSION

The project is scheduled to allow adequate time for design and outage planning. The replacement of the RFPT shaft driven oil pumps with motor driven oil pumps would result in increased plant capacity, availability and reduce the maintenance cost of the reactor feedwater system. The added reliability of the reactor feedwater system will also enhance the safety of the Brunswick Nuclear Plant.

PID 02317A
Category II

## IV. STATUS

This project requires implementation phase approval by Plant Review Group. Implementation of Unit 2 was scope deleted from the B211R1 and being rescheduled into B212R1 in 1996. Implementation of Unit 1 will be scheduled during the B111R1 in 1996.

## V. TARGET COMPLETION

November 1996.

| | |
|---|---|
| PROJECT MANAGER | DENNIS COOPER |
| PID | 02317A |

## HIGH PRESSURE COOLANT INJECTION ROOM CO2 ALARM

### I. PURPOSE AND SCOPE

This project provides local alarms for the High Pressure Coolant Injection (HPCI) Room CO2 system required by OEF Item B3031. This project will replace the existing Unit 1 HPCI Room CO2 control and alarm system with a "PYROTRONICS SYSTEM 3". The work includes the installation of local alarms for all three methods of actuation: automatic thermal detection, manual operation of the main pullbox, manual operation at the CO2 cylinders.

### II. EVALUATION

Schedule Index: 29 - OEF Item B3031 identified the need for local CO2 alarms for personnel safety. Replacement parts for the current system are difficult to locate.

### III. CONCLUSION

Completion of this project will eliminate the:

1. Potential for personnel to be overcome by CO2 during a manual initiation of the CO2 suppression system.

2. System maintenance difficulties due to unavailability of repair parts.

3. Different plant system installations in Unit 1 and Unit 2.

### IV. STATUS

This project requires design phase approval by Plant Review Group.

### V. TARGET COMPLETION

December 31, 1994.

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|---|---|
| PROJECT MANAGER | CRAIG MARCH |
| PID | 03484A |

## RESIDUAL HEAT REMOVAL HEAD SPRAY REMOVAL

### I. PURPOSE AND SCOPE

Residual heat removal (RHR) head spray was intended for use during shutdown cooling to maintain saturated conditions in the reactor pressure vessel (RPV) by condensing steam in the head volume and decreasing thermal stratification in the coolant. During original plant design it was envisioned that vessel cooldown and head removal would be critical path activities at the beginning of plant outages. Head spray was designed to allow more rapid cooldown. Plant operating experience has proven that head cooldown is not on the critical path and RHR head spray is not needed during plant shutdown. Although unused, a considerable number of RHR head spray components are still permanently installed plant equipment and are required to be disassembled/reassembled and tested during each refueling outage. This causes unnecessary radiation exposure to personnel performing maintenance and testing and represents unnecessary activity that can be eliminated. This project will remove RHR head spray system components (e.g., piping, valves, expansion joint, and supports) inside Unit 1 containment. The work area inside the containment between elevations 94' and 105'-10" has exposure levels greater than 100 mR/hour. Related equipment outside containment will also be disposed of.

### II. EVALUATION

Schedule Index: 19 - Elimination of unnecessary work in a radiation area outweighs the dose expected during equipment removal under this project and represents an ALARA improvement (1.0 x 9). Reduction of unnecessary work is a substantial plant enhancement (1.0 x 8). Because the current configuration requires unnecessary outage activity which could affect the critical path, this project potentially represents an improvement in availability (0.2 x 12). Removal of unused RHR head spray equipment has no impact on nuclear safety.

Economic Aspects: Following completion of the project, no additional work or funding will be necessary. A reduction in refueling outage effort and exposure will result over the life of the plant.

Related Standards: The related Work Management Policies are outage management, material condition, and human resources.

Other Considerations: Continued maintenance of an unused and obsolete system could be considered a work-around condition.

### III. CONCLUSION

This project will eliminate unnecessary work during outages and exposure.

### IV. STATUS

This project requires design phase approval by Plant Review Group.

### V. TARGET COMPLETION

PID 04031B - B110R1
PID 04031C - B212R1

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| PROJECT MANAGER | CRAIG MARCH |
| PID | 04031A |

## FEEDWATER CONTROL SYSTEM REPLACEMENT

### I. PURPOSE AND SCOPE

The existing analog feedwater control system (FCS) is obsolete, many components are no longer manufactured, and replacement parts are difficult to obtain. Moreover, at least twelve scrams can be directly attributed to analog FCS failures. This modification will replace the analog FCS, including existing feedwater control relays, switches, control stations, and computation and conversion modules, with a more fault tolerant digital feedwater control system (DFCS). This would likely reduce the frequency and severity of scrams and plant transients resulting from feedwater control system failures. Additionally, replacement of obsolete feedwater system indicators and recorders, and the startup level control valve current to pneumatic positioner as well as the reactor level and feedwater flow transmitters, will be accomplished to enhance the compatibility of the process input and output devices with the new DFCS. Operational and maintenance procedures will be revised and operator and maintenance training will have to be conducted. The simulator will be upgraded to reflect the new design under a separate project control number. The final desired state would be a fault tolerant, on-line tuning DFCS that would provide redundancy and therefore avoidance of plant scrams. The success criterion is that no scrams can be attributed to FW controller system failures.

### II. EVALUATION

Schedule Index: 26 - Replacement parts for the current FCS are difficult to procure or are no longer available because the system is obsolete. The present design is based on single channel analog control. Consequently, the analog FCS has been responsible for a total of at least twelve reactor scrams for the two units. The DFCS is more fault tolerant, self-diagnostic, easier to tune, and redundant, making it more reliable than the analog FCS. Thus, installation of more reliable, state-of-the-art digital feedwater controls will reduce the number of scrams and plant transients that were attributed to the analog feedwater controls. A reduction in plant scrams and transients also reduces the challenges to and demands on plant safety systems (0.2 x 32). Furthermore, greater FCS reliability would improve unit availability due to the reduction in the frequency and severity of these trips (1.0 x 12). Finally, the DFCS provides tolerance to operator errors in that the system can either forbid certain actions or require multi-step operator action to perform a function. Also it provides the potential for more sophisticated control algorithms that make system operation easier, resulting in fewer operator errors. These features make the DFCS more user friendly and forgiving, thus reducing the potential for consequential operator errors (1.0 x 8).

Economic Aspects: Expected benefits of this modification would be ease of maintenance and scram reduction. It has been estimated that in excess of $4,000,000 in unit generation revenue has been lost as a result of the twelve scrams attributed to FCS failure. The controllers tuning capability with an on-line trend display and digital systems self-diagnostics result in easier maintenance. In the long term, routine plant maintenance and calibration is expected to be substantially less than they are now.

Related Standards: This modification applies to Work Management Policies on material condition and operating parameters.

Other Considerations: The Unit 1 DFCS is operational. Unit 2 DFCS is scheduled for implementation during B211R1. Lessons learned from Unit 1 have been incorporated in the Unit 2 Hardware and Software and tested SAT.

## III. CONCLUSION

Unit 2 project shall be implemented as scheduled. The modification is a significant plant enhancement that will produce immediate tangible savings in unit availability.

## IV. STATUS

This project has been implementation phase approved by the Plant Review Group.

## V. TARGET COMPLETION

Plant Modification 89-001 has been implemented. PM 89-002 is scheduled for B211R1.

July 30, 1994.

PROJECT MANAGER CRAIG MARCH
PID 04688A

## MAINTAIN THE BSEP ENVIRONMENTAL QUALIFICATION PROGRAM

### I. PURPOSE AND SCOPE

The Brunswick Environmental Qualification (EQ) Program ensures continued compliance with 10 CFR 50.49,the NRC environmental qualification rule. Since the establishment of the Brunswick EQ program, numerous and significant issues have arisen which have the potential to affect portions of the program. Some of these issues are ongoing. Review, evaluation, and revision of affected qualification documentation is necessary to ensure the quality of the EQ files and support continued qualification of equipment. Fourteen Engineering Work Requests (EWRs) have been specified at different times to address various EQ concerns. All 14 of these EWRs are consolidated in this project. Additionally, other EQ issues will be addressed under this project. For example, resolution of Limitorque Motor Operated Valve issues and the establishment of an environmental specification for plant harsh environment areas are two important initiatives. At the completion of this project, Brunswick should have resolved each of the issues currently within the scope of this project and received final NRC acceptance of each resolution.

### II. EVALUATION

Schedule Index: 10 - If EQ activities identify necessary improvements to systems, structures or components, some contribution to nuclear safety may result. However, such improvements are unlikely and, should they occur, will have small overall impact on the reliability of systems important to plant risk (0.2 x 32). If any equipment upgrades result from EQ activities, a similar, small improvement may be seen in plant availability (0.2 x 12). Maintenance of the EQ program records should make future analysis of equipment easier (plant enhancement, 0.2 x 8). No appreciable effect is anticipated to personnel safety, unit capacity (EQ must support plant uprate, but does not determine it), or ALARA.

Economic Aspects: This project addresses a number of discreet, one-time issues which have arisen relative to EQ. While the level of effort associated with EQ should decrease as these issues are resolved, other issues are likely to be identified in the future. Maintenance of the Brunswick EQ Program is an ongoing effort which must continue until final plant shutdown and decommissioning (PCN 01657A accounts for this routine activity).

Other Considerations: This overall program is required by 10 CFR 50.49. Power uprate will require some high energy line break reanalysis due to expected primary system pressure and temperature changes. The generation of an environmental specification will assure that power uprate parameters are well documented in the BNP EQ design basis.

### III. CONCLUSION

Continuation of this project is necessary for compliance with 10 CFR 50.49, and the current schedule will be maintained. Four EWR's remain to be resolved this year. These EWR's include development of an EQ Specification, preparing revision to QDP-2 for test report traceability, revisions to QDP for Valcor SOV's, and revisions to Rosemount Transmitter QDP's.

### IV. STATUS

This project has been design phase approved by the Plant Review Group.

### V. TARGET COMPLETION

December, 1994.

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| PROJECT MANAGER | JIM MCPADDEN |
| PID | 04830A |

# BATTERY ROOM ANNUNCIATOR ALARM INVESTIGATION

## I. PURPOSE AND SCOPE

Several problems have been identified regarding ventilation of the Battery Room. A Temporary Condition exists for the Control Room annunciators for the ventilation fan flow switches due to spurious alarms during conditions of minimum design flow through the Battery Room. Other problems have been identified regarding the control of temperature in the Battery Room to assure that battery cell temperatures remain above the Technical Specification limits required to ensure that adequate battery capacity is available. The only indication to the operator that ventilation flow is not adequate is dropping Battery Room temperature, which indicates that heater elements have tripped due to overheating under the reduced flow. Because there is no remote indication for the status of the heater elements, confirmation of this condition requires an operator to spend 20 minutes climbing among the cables above the battery room to determine if the heater elements are energized. These deficiencies are symptomatic and point to the need for defining and achieving overall balance, control, and indication of ventilation flow through the Battery Room. This project is a study to identify and develop modifications to the air flow measurement system for the Battery Room that will provide accurate and reliable indication of battery room temperature in the Control Room, balance battery room ventilation flow to design requirements, eliminate spurious annunciation at low flow, and maintain battery room temperature within normal operating range under all operating conditions. The scope of the study will analyze the effects on the various system controls and indications, including instrumentation sensing points, controls for fans and dampers, and the setpoints for the design basis ventilation flow for the Battery Room. The success of this study and the follow-on projects resulting from the study will be evidenced by annunciation in the Control Room without spurious alarms and ventilation improvements that maintain temperatures in the Battery Room within the Technical Specification limits under all expected conditions.

## II. EVALUATION

Schedule Index: 14 - Resolving the ventilation problems will simplify and streamline the ventilation controls for the Battery Room, eliminate spurious alarms, and decrease the extraneous work requests generated by low flow conditions in the ventilation system for the battery, thus providing positive impact on plant enhancement (1 x 8). The intent of this project is to improve the availability of the station batteries by implementing ventilation controls to maintain temperatures in the Battery Rooms within the limits of the Technical Specifications. Since common cause failure of the batteries is a major contributor to failure of the DC Power System, improved monitoring of temperatures in the battery room is expected to have a moderate to high impact on DC Power System availability. Therefore, a nuclear scaling factor of 0.2 is assigned to this initiative (0.2 x 32).

Economic Aspects: The cost of implementing the modifications expected to result from this study will be recovered in reduced costs for extraneous maintenance and upkeep on the ventilation systems for the Battery Rooms.

Related Standards: The Work Management Policy on material condition applies to this project.

Other Considerations: The existing Temporary Condition for ventilation flow annunciation will be cleared during the current dual-unit outage. However, other modifications that will likely result from this study will not require an outage for implementation. A battery ventilation flow test was conducted in August 1992 to identify specific deficiencies in ventilation controls and instrumentation that require permanent design solutions to resolve.

## III. CONCLUSION

Based on the project information available at this time, the study has already identified several benefit producing recommendations and, therefore, will continue.

## IV. STATUS

Project has been implementation phase approved by the Plant Review Group.

## V. TARGET COMPLETION

May 31, 1994.

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| PROJECT MANAGER | LARRY WALTON |
| PID | 05983A |

## OFF-GAS DRAIN TANKS RESERVOIR

### I. PURPOSE AND SCOPE

The electrical level control and indication systems for the off-gas drain tank (OGDT) and its loop seal reservoir have had a history of problems that have initiated several incidents resulting in loss of main condenser vacuum. Some of these incidents have led to power reductions or reactor scrams. The control failures and other material deficiencies in the system are caused, in part, by the high humidity in the residual heat removal (RHR) room (17 foot elevation) where the OGDT is located. For example, the humidity causes corrosion of exposed carbon steel solenoid valve linkages, interfering with loop seal reservoir drain and makeup valve operation. Failure of these valves to operate properly will cause condensate to backup into the system, eventually leading to loss air ejector condensing capability and, thus, loss of condenser vacuum. Operator response to loss of vacuum incidents is hindered by the current indication and control system since determining whether this system is the cause is unusually difficult. This is because of the lack of remote and accurate level indications for the OGDT and loop seal reservoir. Also, to determine the level in the OGDT, the operator must enter a contaminated area and check the high level alarm annunciator. Even if a high level is indicated, the operator must then try to start the OGDT pumps. Failure of the drain pump to start indicates a low level in the OGDT, leading to the conclusion that the loop seal reservoir level control system is causing a problem. Also, the high level alarm for the OGDT is also not reliable, since the alarm has failed to annunciate when the drain pump and level control malfunction. Other control and indication related deficiencies have been identified during investigations of loss of condenser vacuum incidents. The scope of the project includes installing two float-type liquid drainers with associated piping in place of the electrical level control valves for the OGDT, installing a manual drain from the OGDT loop seal reservoir, replacing reed switch level indicators with magnetic float type liquid level indicators (with remote annunciators), and modifying piping to eliminate hold-up points for condensate. These modifications will provide more reliable level control to prevent water from backing up in the off-gas 30-minute hold-up line and will provide remote mechanical indication of water level in the off-gas drain tank. Successful implementation of this project will be evidenced by a reduction in loss of condenser vacuum events caused by the off-gas system and consistent, reliable level indication for the off-gas drain tank and the loop seal line reservoir.

### II. EVALUATION

Schedule Index: 27 - Removing the potential for loop seal line blockage increases plant availability by reducing the potential for loss of condenser vacuum events that have resulted in reactor scrams (1.0 x 12). The deficiencies being corrected have also caused power reductions at BNP in the past. Implementing this project has a positive impact on plant capacity by reducing the potential for such power reductions in the future (0.5 x 10). The reduced potential for the off-gas system to cause a loss of condenser vacuum event has a low positive impact on nuclear safety due to the improved availability of the condenser as a heat sink when decay heat removal is required (0.2 x 32). Correcting long-standing problems in the off-gas system for which special plant procedures were developed has a moderately positive impact on plant enhancement (0.5 x 8).

Economic Aspects: Reactor scrams and power reductions due to loss of condenser vacuum can result in one or two days of lost generating capacity each time the off-gas drain tank and loop seal reservoir malfunction. Implementation of this project will have no substantial impact on the long term costs of system maintenance of the off-gas system.

Related Standards: The Work Management Policies on material condition and operating parameters are applicable to this project.

**PID 06202A**
**Category II**

Other Considerations: This project includes modifications that must be implemented during an outage.

## III. CONCLUSION

Problems with the off-gas system drain tank valves and associated piping has, on several occasions, caused reactor scrams and power reductions. Implementing this project will correct system reliability deficiencies and will enhance the ability of the operator to determine system conditions. This project will be completed as scheduled or earlier, if feasible.

## IV. STATUS

This project requires implementation phase approval by the Plant Review Group.

## V. TARGET COMPLETION

May 1996.

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| PROJECT MANAGER | CRAIG MARCH |
| PID | 06202A |

## REPLACE HPCI, RCIC, AND RPS TOPAZ INVERTERS

### I. PURPOSE AND SCOPE

The purpose of this project is to resolve the spare parts and reliability issues associated with Topaz inverters. Topaz inverters are presently used in a variety of systems for DC to AC conversion to allow control, logic and instrumentation functions to be performed with AC power. The installed models are no longer available and the original manufacturer will not refurbish the units. Additionally, replacement parts are unavailable. This has affected the availability of the high pressure coolant injection (HPCI)and reactor core isolation cooling (RCIC) systems. Initially, all component loads supplied by the HPCI and RCIC Topaz inverters will be removed. Then, the Topaz inverters and components will be replaced with a simplified DC to DC power distribution system. The function of all the system components originally supplied by the inverters will be the same. New DC HPCI and RCIC flow controllers will be procured. New power supplies will be procured that will feed the remaining instruments after the inverter loads are removed. The desired state at the completion of this project is to have available, in place of the obsolete Topaz inverters, reliable power supplies that are qualified for the environment to which they are exposed. The success criterion of this project is the elimination of HPCI and RCIC systems unavailability due to the failure of the Topaz inverter.

### II. EVALUATION

Schedule Index: 13 - This initiative moderately improves the availability of the HPCI and RCIC systems. Flow control improvements do not have a major impact on HPCI or RCIC reliability. Based on the PRA model, the HPCI system is a system of relatively low importance. However, when combined with the RCIC system, the HPCI system is weighted higher. Therefore, a nuclear safety scaling factor of 0.2 was assigned to this initiative (0.2 x 32). Further, this initiative corrects the failure of Topaz inverters in the HPCI and RCIC systems which has a potential for a loss of unit availability. The potential loss of unit availability would be most likely caused by entering a HPCI and/or RCIC inoperable LCO (0.2 x 12). Finally, this modification is a medium positive impact on plant enhancement in that it contributes to improvement in the maintenance and operations of the HPCI and RCIC systems (0.5 x 8). Maintenance work-arounds such as replacing individual components within Topaz inverters would be avoided, and the elimination of Topaz inverter failures would enhance system operation.
Economic Aspects: The estimated cost of the project includes the RCIC and HPCI modifications. The expected benefits of this project are the improved material condition and reliability of the RCIC and HPCI systems. The changes in the routine periodic maintenance costs as a result of this initiative are difficult to quantify. The maintenance cost will diminish but maintenance will clearly be required for the new equipment.

Related Standards: The Work Management Policy on material condition is applicable to this project.

Other Considerations: The critical short term work to be completed is the RCIC and HPCI Topaz inverter change out. Other related work is also in progress. The feedwater Topaz inverters are being removed under PID 04688A. The RCIC and HPCI steam leak detection system Topaz inverters are being replaced with a NUMAC digital system under PID G0051A.

### III. CONCLUSION

The RCIC and HPCI modifications will be implemented as scheduled. This initiative improves the availability of the RCIC and HPCI systems and helps reach availability goals for those systems. It also will enhance the plant material condition by upgrading critical plant systems with components that are

currently available.

## IV. STATUS

This project has been design phase approved by the Plant Review Group.

## V. TARGET COMPLETION

May 1996.

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| PROJECT MANAGER | LARRY WALTON |
| PID | 07148A |

## REMOVE AND REPLACE OBSOLETE BAILEY SR-1310 AND SR-1110 RECORDERS

### I. PURPOSE AND SCOPE

Currently the BSEP control rooms have Bailey narrow range chart recorders which have been obsolete since 1974 and for which the spare parts are depleted. This project is currently replacing some of the recorders in the control rooms for both of the Brunswick Units. Some of the recorders have regulatory related operational requirements and are in need of parts which could impact plant operations. The installation of new recorders will help prevent plant operations from being impacted. Existing Bailey recorders are to be replaced with Leed & Northrup Speedomax models 131, 132, or 133 narrow range chart recorders. Successful completion of this project would allow the Control Room operators to properly document important plant parameters which will allow continued plant operations and also reduce out of service recorders.

### II. EVALUATION

Schedule Index: 6 - The only categories are affected by this project are plant enhancement and unit availability. Changing out the existing recorders will enable the operator to have a more reliable means to diagnose off gas problems. However, this improvement will have no appreciable impact on nuclear safety (0 x 32). The plant would be enhanced with red indication of plant parameters and improved operator effectiveness (0.5 x 8). There is a potent for the plant availability to be reduced if those recorders required by regulatory considerations are out of service for lack of parts (0.2 x 12).

Economic Aspects: The cost of routine maintenance and calibration of the recorders will likely be reduced. The expected benefits of the replacement of the obsolete Bailey recorders are reduced maintenance and improved operator performance.

Related Standards: Applicable Work Management Policies for this project are material condition and operating parameters. Having new long-term (20 yrs) reliable recorders would meet the policy of continuously monitoring operating plant parameters.

Other Considerations: Some of the plant systems' recorders will need to be replaced during a plant outage because of their location in the Control Room and the importance of that system to plant operation. The stock of replacement parts for these recorders at the BSEP is depleted; therefore it is advisable to replace them at the scheduled dates.

### III. CONCLUSION

The project will continue at the scheduled rate and will be completed by November 1997. Replacement of the old recorders will prevent the possible loss of vital equipment during power plant operations.

### IV. STATUS

Project requires design phase approval by the Plant Review Group.

### V. TARGET COMPLETION

November 1997.

PROJECT MANAGER DAN MOORE
PID 07208A

## REPLACE LIGHTING AND COMMUNICATIONS UNINTERRUPTIBLE POWER SUPPLY

### I. PURPOSE AND SCOPE

This project will replace the existing obsolete lighting and communications uninterruptible power supply (UPS) system with a more modern and maintainable system. The lighting and communications UPS system supplies 120/208V AC power to the plant paging and intercom system, the plant evacuation and fire alarm system, lighting in the Control Room and other critical areas, and the plant card reader and security system (e.g., the explosive entrance detectors and security computer system). The UPS system was originally installed in 1973 and has become a significant maintenance problem due to normal equipment aging. Support from the original manufacturer (Static Products Incorporated, now International Power Machines) has been declining and will continue to erode due to the unavailability of the spare parts for this obsolete equipment. In order to maintain the functions of the UPS system, it is crucial that the current hardware be replaced with a modern system for which part support is available.

The initial phase of the project identified the new system and vendor to replace the existing lighting and communication UPS system. The project will be successful if the UPS system maintenance costs are reduced and the system reliability is improved. Also, the equipment modernization process itself should not unnecessarily impact plant operations or personnel safety.

### II. EVALUATION

Schedule Index: 23 - Plant lighting and the plant paging system are very important to successful operator actions during recovery from any potential accident. Since operator actions are cr d in preventing and mitigating core damage, the replacement of the lighting and communications UPS impacts nuclear safety scaling factor (0.2 x 32). Personnel safety is improved by this project due to the potential lost time accident that could occur if the evacuation and fire alarms were to be without power. Loss of plant communications could also have the potential for a lost time accident (0.5 x 29). There is also some potential for unnecessary radiation exposure if the plant intercoms and alarms are unavailable due to a loss of power (0.2 x 9).

Economic Aspects: The present system is obsolete and spare parts are becoming increasingly scarce. A new UPS will allow continued safe plant operation and will reduce maintenance costs as compared with the present installed system.

Related Standards: The Work Management Policy applicable to this project is plant material condition.

Other Considerations: Because of the importance of the UPS system, it is critical that replacement of this equipment is done in a manner that will not have any adverse impacts on plant security or vital alarms. This project is not outage dependent.

### III. CONCLUSION

Installation of a new lighting and communications UPS system is needed to support continued efficient plant operational control. System maintenance costs for the current obsolete equipment will also be reduced. This project will be completed as scheduled and will allow orderly modernization of the lighting and communications UPS system.

IV. **STATUS**

Project is design phase approved by the Plant Review Group.

V. **TARGET COMPLETION**

November 1995.

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| PROJECT MANAGER | LARRY WALTON |
| PID | 07862A |

## RPV SHELL TEMPERATURE MONITORING THERMOCOUPLE CABLE REPLACEMENT

### I. PURPOSE AND SCOPE

The purpose of this project is to study and propose solutions to modify the Reactor Pressure Vessel (RPV) Shell temperature monitoring system. Seven of the sixteen thermocouples routed through thermocouple splice box 2-XM6 have failed, and the thermocouple splice box has been identified as difficult to maintain.

The proposed modification is to replace the RPV Shell thermocouple splices with thermocouple terminal blocks, to replace cables from penetrations to the splice box with cables rated at a higher ambient temperature, and to relocate the splice box. Maintenance and Instrumentation and Control personnel experience excessive doses due to constant repairs to the RPV Temperature Monitoring System.

The desired state at the completion of this project is to have a reliable RPV Shell temperature monitoring system. The success criteria of this project are to develop and implement a modification that will enhance equipment reliability and reduce personnel exposure when troubleshooting and/or repairing equipment.

### II. EVALUATION

Schedule Index: 21 - This project affects the reliability of the RPV Shell temperature monitoring system. This system is utilized to verify that Technical Specifications temperature limits are met for RPV temperature monitoring during hydrostatic testing, during cold shutdown or refueling, and prior to reactor recirculation pump start. Therefore, this system protects the integrity of the reactor pressure vessel. Failure to maintain the RPV integrity could potentially result in an increase of the RPV rupture frequency from 1.0E-8 per year to 1.0E-6 per year (based on the WASH-1400 study). The RPV rupture core damage frequency (CDF) could be as high as 4% of the total CDF. Consequently, this project was given a nuclear safety scaling factor of 0.2 because it improves the reliability of the reactor pressure vessel, which has a small positive affect on CDF (0.2 x 32).

Furthermore, this project eliminates a potential threat to personnel safety (0.2 x 29) because it would reduce the maintenance time spent in a high temperature, harsh environment next to the biological shield (the location of the thermocouple splice box). Additionally, this project is considered a medium positive impact on the ALARA scaling factor (0.5 x 9), in that personnel exposure when troubleshooting and/or repairing equipment would be reduced. Finally, this project is considered a medium positive impact on plant enhancement (0.5 x 8) in that it contributes to improvement in operations during cold shutdown and refueling plant conditions as well as during reactor vessel hydrostatic testing.

Economic Aspects: It is expected that long term maintenance and ALARA costs will be reduced as a result of this initiative.

Related Standards: The Work Management Policy on material condition is applicable to this project.

Other Considerations: A detailed ALARA study should be performed to verify that the expected person-rem savings would be reached. Alternate temperature indications for RPV metal temperatures may need to be provided while the work is in progress to comply with Technical Specifications.

### III. CONCLUSION

This project will be completed as scheduled. The eventual implementation of this project is expected to contribute to achieving the BNP ALARA goals.

PID 08341A
Category II

IV. STATUS

Project is design phase approved by the Plant Review Group.

V. TARGET COMPLETION

B110R1 and B212R1.

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| PROJECT MANAGER | CRAIG MARCH |
| PID | 08341A |

## JET PUMP BEAM REPLACEMENT

### I. PURPOSE AND SCOPE

The project replaces the twenty jet pump "hold down" beams in the Unit 2 reactor vessel. per recommendatios contained in GE RICSIL 065. The new jet pump beams have received high temperature annealed heat treatment during manufacturer and are less susceptible to intergranular stress corrosion cracking as was observed at Grand Gulf Station.

### II. EVALUATION

This project will ensure the long term integrity of the jet pump beams.

### III. CONCLUSION

This project will proceed as scheduled.

### IV. STATUS

This project has been implementation phase approved by the Plant Review Group.

### V. TARGET COMPLETION

June 1994.

PROJECT MANAGER VAUGHN WAGONER
PID 12984C

PID 12984C
Category II

## FLOOR DRAIN FILTER RETROFIT

### I. PURPOSE AND SCOPE

Liquid radwaste processing was originally designed to be accomplished by two process paths, a floor drain system for "dirty" liquid waste and a waste collector system for "clean" liquid waste. A previous modification on the original floor drain filter system did not achieve the desired performance objectives and resulted in an inoperable floor drain filter. The inoperable condition of the floor drain filter leaves the waste collector system as the only path for processing liquid radwastes. Since the waste collector filter is designed for processing "clean" waste water, the presence of oil-containing water causes frequent changeouts of the waste collector filter elements that are costly and incur unnecessary expenditure of person-rem. The resin precoat is exhausted much more rapidly due to the current operating lineup, thereby generating extra costs and solid radwaste to ship off the site. Extended failures of the waste collector system could result in a dual unit shutdown because of an inability to process liquid radwaste.

The purpose of this project is to modify the floor drain filter to restore the filter to its original, functional design. This will restore the floor drain system to service and provide separate paths for processing liquid radwastes, thereby improving the operation of the waste collector filters, reducing the frequency of filter changeouts, and providing an alternate path for processing all liquid radwastes in the event one of the systems becomes inoperable.

Successful completion of this project will be evidenced by demonstrated ability to process all liquid radwaste through either the floor drain system or the waste collector system and by a reduction in the frequency of element changeouts in the waste collector filter.

### II. EVALUATION

Schedule Index: 12 - Returning the floor drain filter to its original design will return the waste processing systems to their normal configurations and intended uses, provide redundancy in waste processing paths, and restore the ability to maintain cleanliness in the waste collector system, resulting in a significant plant enhancement (1.0 x 8). Returning the floor drain system to service reduces the possibility of a dual unit shutdown due to an inability to store or process radwaste for extended periods (0.2 x 12). This project will reduce the filter maintenance related radiation exposures caused by mixed stream processing (0.2 x 9).

Economic Aspects: Retrofitting the floor drain filter will reduce the routine costs of cleaning the waste collector system to remove oil impurities that the system was not designed to handle it.

Related Standards: The Work Management Policy applicable to this project is material condition.
Other Considerations: The modification does not require an outage to implement.

### III. CONCLUSION

In inoperability of the floor drain filter causes all liquid radwaste to be processed through the waste collector system, which is designed to process only "clean" radwaste, and causes increased costs for maintenance and cleaning of the waste collector system. Additionally, the lack of redundant processing paths presents a potential for forcing unit shutdown if the waste collector system is inoperable for three or more days. Restoring the floor drain filter to its original design offers immediate economic and material benefits, so this project will be implemented as scheduled.

**PID 81401A**
**Category II**

## IV. STATUS

Project is design phase approved by the Plant Review Group.

## V. TARGET COMPLETION

December 30, 1994.

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| PROJECT MANAGER | CRAIG MARCH |
| PID | 81401A |

RADWASTE SAMPLING SYSTEM UPGRADE

## I. PURPOSE AND SCOPE

The BSEP radwaste sample system monitors some of the major sources of potential reactor water impurities, including the condensate demineralizers and processed makeup water. The radwaste sampling system has experienced several long term and repetitive problems. Many sample points have been plugged for years. Conductivity recorders normally track as many as 7 variables, but they print data on only 8% of the chart paper range, making data analysis difficult. In addition, conductivity monitor failures cause the plant to enter LCOs frequently. In 1989, INPO issued finding CY.1-1, stating, in part: "The conductivity monitors and recorders for the condensate filters and demineralizers located in the radwaste control room do not provide information useful for controlling the operation of the systems. Also, the radwaste demineralizer conductivity monitor has been inoperable for several years. The operators do not have indication when the demineralizer resin is exhausted and when impurities are sent to the waste sample tank."

This project will be successful when the upgraded system is in place and fully operable; E&RC staff have accurate chemistry data to work with; and more proactive chemistry, filter, and resin management is demonstrated.

## II. EVALUATION

Schedule Index: 15 - The plant is significantly enhanced by allowing plant personnel the ability to monitor critical chemistry parameters as well as prevent continual maintenance on obsolete equipment (1.0 x 8). Completion of this project is expected to result in a net savings of 16.3 person-rem (0.5 x 9). Of the four chloride intrusion monitors identified in technical specifications, two are made inoperative by failure of the sample chiller. If the other two are out of service, then the unit must be brought to hot shutdown within 12 hours. This potential causes a minor concern for loss of unit availability (0.2 x 12). Although this project will significantly improve the ability to monitor chemistry of important makeup water supply systems, there is insufficient evidence to indicate that improvements in water quality of important safety systems would result in significant reduction of corrosion or other beneficial effects that might improve nuclear safety (0.0 x 32).

Economic Aspects: Due to radwaste processing costs and current chemistry practices, this project is expected to result in a cost savings of $2.8 million over the remaining life of the plant. General plant maintenance costs are expected to be somewhat lower following completion of this project.

Related Standards: The Work Management Policies applicable to this project are material condition and operating parameters.

Other Considerations: Sample temperature is a critical parameter for accurate analysis. The FSAR states that the temperature of samples undergoing in-line analysis is designed to be maintained automatically at 77 degrees F ( + or - 1 degree ). Technical specification limits are given at 25 degrees C (77 degrees F). The temperature is controlled at the sample station by the chiller system, which has been very unreliable. The INPO finding CY.1-1 is being tracked by FACTS Numbers 89B0905, 89B0906, and 90B1031. Closure of the INPO finding has been rescheduled several times. Most of the work can be done while the units are on line. Addition or tie-in of some sample points, especially from the condensate system, may require an outage. A presently recommended option involves radwaste sample station replacement with a station prefabricated off site by a vendor. If this option is accepted, off site fabrication time must be scheduled between design approval and installation.

## III. CONCLUSION

This project is important to proper monitoring of reactor water chemistry and will be completed as scheduled. The conditions warranting action have been present since 1985 and resulted in a 1989 INPO finding that is still open.

## IV. STATUS

Project is design phase approved by the Plant Review Group.

## V. TARGET COMPLETION

July 1996

PROJECT MGR. CHRIS HUGHES
PID 84587A

EQUIPMENT DATA BASE SYSTEM

## I. PURPOSE AND SCOPE

The Equipment Data Base System (EDBS) provides listings of components and materials for use in maintenance, design, inventory management, configuration control, and operations. The EDBS has proven to be a major contributor to productivity and efficiency improvements by reducing the time required to conduct research, develop design packages, obtain parts, and to perform the work. However, the EDBS project was suspended before all data and parts listings could be entered into the system. The Data Collection and the Parts Listing elements of the project are only 50 percent and 65 percent complete, respectively. The Data Collection task identifies plant documents and other information related to specific components. The Parts Listing task consists of reviewing plant and vendor documents to develop a complete component bill of material and identifying both stocked and non-stocked parts for the components.

The purpose of re-initiating this project is to complete collecting information on systems, components, and parts for the Data Collection and Parts Listing tasks and to load the information into the EDBS for use by the Maintenance, Operations, Technical Support and Engineering staffs. Successfully completing this project will result in the EDBS becoming a finished database with component data on all plant systems entered, and capable of supporting all plant maintenance activities. Completing the EDBS will reinforce and invigorate productivity and performance improvements related to researching and developing design change packages, controlling the plant configuration control, and optimizing the parts inventory.

## II. EVALUATION

Schedule Index: 29 - Completing the EDBS project improves the availability and usefulness of a tool with a proven record for improving productivity, resulting in a significantly positive impact on plant enhancement (1 x 8). More efficient maintenance and improved productivity in identifying components, researching information, and developing design change packages improves unit availability by improving outage planning and scheduling, reducing rework, and assuring the correct components are identified and obtained to control items on the critical path to unit startup. Additional positive impacts on unit availability result from more capable and effective management of items that become the critical path to startup (1 x 12). A completed EDBS has a positive impact on ALARA by providing effective control of equipment configuration and component labelling, along with accurate information on component location, that facilitates work planning and efficient work performance that reduces personnel exposures associated with inspection, maintenance, and repair activities (1 x 9). Completing the EDBS improves the effectiveness of a management tool to increase the productivity and efficiency of technical support activities and, as such, does not directly impact the performance of systems with importance to safety. Therefore, this project has no appreciable effect on the nuclear safety scaling factor.

Economic Aspects: CP&L will recoup the costs associated with this project, and the additional maintenance and upkeep required to maintain the EDBS operational and accurate, through improved efficiency and productivity over the remaining life of the plant. Completing this project will result in efficiencies being realized both onsite and offsite. Estimates of the cost savings due to improvements in efficiency total over $3 million from 1989 through 1991 for the current system; even larger savings are expected with the fully-completed system.

Related Standards: The Work Management Policies applicable to this project are material condition and design documentation.

Other Considerations: The EDBS is a key information system for an effective configuration management program at BSEP. An EDBS model developed and recommended under the initiative of the Corporate Inventory Management Initiatives Steering Committee requires completion of the EDBS in order to be implemented. The EDBS interacts with other site systems to identify current and pending plant configuration changes. A complete EDBS is essential to fully utilizing these systems to achieve the process efficiencies possible.

## III. CONCLUSION

The EDBS will be completed as scheduled based on its proven value in improving productivity, efficiency, configuration control, maintenance and operations. The EDBS is the only system that contains component data and interfaces with other important information and management systems to provide this data.

## IV. STATUS

This project requires management approval.

## V. TARGET COMPLETION

December 1995.

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| PROJECT MANAGER | C. W. MARTIN |
| PID | F0025C |

SMALL MODIFICATIONS

## I. PURPOSE AND SCOPE

The "small mod" process provides a means to implement small plant mods that do not require preliminary engineering and total cost is not expected to exceed $50K.

The standard budgeting/tracking system, while appropriate and necessary for larger projects, is cumbersome and untimely for small (< =$50,000) projects. A single "umbrella" project which could prioritize and implement these small mods is preferred and achieved by the "small mod process".

## II. EVALUATION

## III. CONCLUSION

The Small Mods Project is an efficient method to plan and budget small plant modifications.

## IV. STATUS

Project has been approved for implementation in 1994. Technical Support will prioritize Small Mods and bring to Plant Review Group for approval.

## V. TARGET COMPLETION

December 1996.

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| PROJECT MANAGER | Craig March |
| PID | G0015A |

TURBINE UPRATE

## I. PURPOSE AND SCOPE

This project improves BSEP efficiency by reducing main turbine throttling losses. The BSEP turbines have four inlet valves to the first stage. When operated in full admission, each of the four valves throttles equally to control steam flow to the turbine. In partial arc admission, two or three of the valves operate wide open at full power and control is obtained by throttling the remaining valve(s). Partial arc admission is more efficient at full power (for the same steam flow and reactor power) because throttling losses are less.

Operation in partial arc admission results in more uneven stresses than operation in full arc admission. The High Pressure Turbines in both units have been modified to strengthen the High Pressure Rotors for operation in partial arc operation.

Unit 2 was converted to partial arc admission during the fall of 1991. During subsequent operation, turbine oscillations due to control problems at high power necessitated a 75% power operation limit. These problems were addressed and corrected. Unit 2 is now in three admission partial arc operation and has demonstrated successful operation during the last run. Minor remaining control issues are being addressed during B211R1.

Turbine output is affected by a number of factors, including circulating water temperature, but preliminary estimates are that conversion to partial arc admission has resulted in about 1.5% increase in turbine output. Conversion of the Unit 1 turbine to partial arc admission is contingent on successful and demonstrated resolution of the Unit 2 control problems at high power. Efforts have been undertaken to avoid similar problems on Unit 1.

This project included feedwater flow nozzle calibration testing to verify actual feedwater flow to the reactor.

## II. EVALUATION

The feedwater flow nozzle calibration test resulted in a decrease of power output in Unit 2 and an increase of power in Unit 1.

Unit 2 performance testing indicates that the increased power output attributable to partial arc operation is about 8.5 MWe. It is expected that the conversion of Unit 1 will also produce about 1.5% increase in power output. These increases are significant in that additional power output is achieved without increases in fuel or operating expense.

Economic evaluations show that the project is very beneficial. The evaluations will improve as the Low Pressure Rotors (with improved efficiency) are installed. The Low Pressure Turbine contribution to improved efficiency have now been included in these economic evaluations as the low pressure rotors are not a part of this project.
This project is most closely related to the Work Management Policy for material condition, particularly with regard to optimizing plant productivity.

This project to uprate the turbines is related to the core thermal uprate, PID 02164A. The nuclear safety and licensing considerations are more significant for core thermal uprate. These two projects are considered separately because of their different natures.

## III. CONCLUSION

This project will be completed as scheduled to substantially increase turbine capacity. Actions to resolve the minor control problems on Unit 2 will continue to completion in outage B211R1. Conversion of the Unit 1 turbine to partial arc admission will occur once the Unit 2 control problems at high power have been resolved.

## IV. STATUS

The Unit 2 project is phased approved for implementation and the Unit 1 project requires design phase approval by Plant Review Group.

## V. TARGET COMPLETION

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| July 1994 | Unit 2 |
| June 1995 | Unit 1 |

| | |
|---|---|
| PROJECT MANAGER | DAN MOORE |
| PID | G0058A |

## BWR THERMAL HYDRAULIC STABILITY ISSUE

### I. PURPOSE AND SCOPE

Thermal hydraulic instability oscillations have been detected at some BWRs, potentially causing core local thermal limits to be exceeded for short durations. This indicates that actual thermal margins are not as large as intended in the thermal hydraulic design. As a result, there is some potential of localized fuel damage under some conditions if this phenomenon is not adequately controlled. The purpose of this project is to increase safety margins relative to BWR thermal hydraulic instability by selecting and implementing one of the BWR Owner's Group (BWROG) Stability Committee's solutions. Selection of a solution for BNP will be made after NRC approval of the BWROG solutions (NRC IE Bulletin 88-07, Supplement 1). This project includes developing BNP system modification alternatives based on the approved solutions, assessing their relative suitability, and implementing the best alternative. Generic-modification technical development and the associated licensing of the modification alternatives are accomplished through the BWROG. Development and licensing specific to BNP will be completed under this project, which will eventually involve detailed engineering, material procurement, and installation. The project implementation may also involve revision and verification of the emergency procedure guidelines (EPG) and improvements to safety related systems such as the reactor protection system (RPS). The success criterion for this project is that the chosen modification and overall implementation adequately address the concerns regarding thermal hydraulic instability margins such that the risk of fuel damage during future operations is minimized.

### II. EVALUATION

Schedule Index: 13 - A nuclear safety scaling factor of 0.2 has been selected based on the design alternatives under consideration (0.2 x 32). However, if the selected alternative involves a design option that increases the potential of plant trips (e.g., additional reactor trip signals), then further PRA evaluation would be required to assess the potential impact on theoretical core damage frequency. This project is also a plant enhancement in that it is expected to help operators manage plant conditions more effectively when the plant is operating in some configurations. This improved control will help operators avoid inadvertent entry into the unstable thermal hydraulic region, thus avoiding unknown localized core conditions and minimizing the potential for unit shutdowns to investigate (0.2 x 12).

Economic Aspects: Following project completion, routine maintenance costs will likely increase. However, the project and continuing increased maintenance costs will be somewhat offset by the reduced potential for shutdowns due to thermal hydraulic instability.

Related Standards: This project impacts the Work Management Policies on material condition and operating parameters.

Other Considerations: It is anticipated that a regulatory requirement will emerge out of the discussions between the NRC and the BWROG about the BWR thermal hydraulic stability issue.

### III. CONCLUSION

The BWROG has issued bid specifications to vendors and vendor selection is scheduled to occur in 1994.

This project will proceed as planned assuming vendor selection remains on schedule.

PID G0105A
Category II

## IV. STATUS

Project has been study phase approved by the Plant Review Group.

## V. TARGET COMPLETION

December 1995.

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| PROJECT MANAGER | CRAIG MARCH |
| PID | G0105A |

## 125/250 VDC BATTERY GROUND DETECTION IMPROVEMENTS

### I. PURPOSE AND SCOPE

Electrical ground detection problems on the 125/250 VDC electrical system have delayed startup and have consumed hundreds of man-hours in repairs and alternative measures to detect and isolate (locate) grounds. The primary cause of these problems is that the 125/250 VDC electrical system ground detectors are inaccurate, unreliable, and obsolete. Repairs to the detectors are costly and difficult to perform since the repairs are performed at the component level and replacement parts are difficult to obtain. Frequent maintenance on ground detectors also increases the potential for creating circuit problems and increases general degradation of the detectors' circuit boards. Deficient and inaccurate control room annunciations have resulted in the need for ground readings to be taken manually on each shift. In addition to these hardware problems, the lack of a firm design basis for the setpoints of the detectors results in numerous man-hour expenditures to trace and isolate grounds that may be of little importance.

This project will provide a technical basis for the ground detection system requirements and will establish reasonable and maintainable annunciation setpoints. The scope of this project also includes researching industry ground detection systems to identify and select the most suitable system. Selection criteria will include maintenance, annunciation, and ground isolation considerations.

Successful completion of this project includes developing a valid setpoint design basis, which is to be accomplished by evaluating the electrical operating values for various DC components and by reviewing industry standards, BSEP system configuration, and the associated PRA implications. The success of the system upgrade will ultimately be measured in terms of man-hours saved on isolating grounds and repairing failed detectors, by a decrease in false control room annunciations, and by a significant increase in the probability of the detectors remaining calibrated.

### II. EVALUATION

Schedule Index: 20 - Although AC electrical power is used for most safety-related equipment, DC power is used for certain safety-related equipment and instrumentation in the event of a loss of all onsite and offsite AC electrical power (station blackout). Improved ground detection techniques providing real-time detection and more rapid location of system faults provides more assurance that the DC system will supply power to vital equipment when required, resulting in some positive impact on nuclear safety (0.2 x 32). A major reason for identifying and removing electrical grounds is to provide safe working conditions for personnel and to ensure proper and safe operation of plant electrical equipment. Therefore, improving the reliability of ground detection assists operators in assuring that no unnecessary conditions exist to endanger personnel or plant equipment (0.2 x 29). Improved ground detection and isolation techniques will reduce the effort needed to identify and correct sources of electrical grounds, resulting in a moderate plant enhancement (0.5 x 8). Finally, the capability to more efficiently establish the source of a ground will reduce plant radiological area entries needed to perform ground detection, reducing the personnel radiation exposure currently expended in performing this activity (0.2 x 9).

Economic Aspects: Upgraded ground detection has substantial potential economic benefits. Upgrading of the ground detection system should alleviate the potential for delayed startup due to problems with detecting and isolating DC grounds. The costs that can be saved are evidenced by the approximately 1000 man-hours spent on such activities during a delayed startup of Units 1 and 2 in 1991. In addition, the need to perform manual ground detection could be removed, resulting in additional cost savings and improved productivity.

Related Standards: The Work Management Policies applicable to this study are material condition, design

documentation, and operating parameters.

Other Considerations: None

## III. CONCLUSION

Because of the significant benefits this project is expected to yield, it will be accomplished as scheduled.

## IV. STATUS

Project has been implementation phase approved by the Plant Review Group.

## V. TARGET COMPLETION

December 1994

PROJECT MGR. LARRY WALTON
PID G0180A

BNP REFRIGERANT REPLACEMENT

## I. PURPOSE AND SCOPE

This project is currently a study to assess one of the potential impacts on BNP of the Clean Air Act. Federal law now supports the United Nations protocol to gradually phase out production of chlorofluorocarbons (CFC) refrigerants by the year 2000, but this date could be moved up (by presidential directive) to as early as 1995. The objective is to protect the Earth's ozone layer. Current CFC production is limited to the level produced in 1986. Under current law, this level will be reduced by 20 percent in 1993, 50 percent in 1995, and 85 percent in 1997, with production of new CFCs ending entirely no later than the year 2000. Manufacturers have indicated that production will end in 1995, regardless of federal law. The U.S. Clean Air Act also bans intentional venting of CFCs as of July 1, 1992. Enforcement of this law is the responsibility of the Environmental Protection Agency (EPA). The primary refrigerants used in BNP cooling systems are CFCs, so the availability of replacement refrigerants will be increasingly important as CFC production is restricted and terminated. Also, maintenance on cooling systems is already more difficult due to the venting restriction. The initial objective of this project is to identify and evaluate the impacts of using alternate refrigerants in the affected plant systems. Once the study phase has been completed, plant physical modifications must be developed and carried out expeditiously. The project may include increasing near- term inventories of CFC refrigerants in plant storage as physical plant adjustments are planned and carried out. The relative refrigeration-cycle effectiveness of alternate refrigerants will very likely impact cooling system design capabilities, requiring equipment changes. In particular, this project addresses Turbine Building chillers, Drywell chillers, Control Building chillers, Augmented Off-Gas (AOG) Building filter chillers, and the Training Building simulator chillers. Other plant equipment, vehicles, and buildings are also affected. This project will be successful if all refrigerant related Clean Air Act constraints are implemented without impacting plant operations.

## II. EVALUATION

Schedule Index: 12 - This project does not impact any systems important in preventing core damage (0.0 x 32). Nevertheless, failure to comply with and anticipate the effects of the regulation would have a major impact on unit availability (1.0 x 12). Much of the impact depends on the availability of alternative refrigerants as the phaseout of CFC production continues. The worst case situation could involve plant shutdown due to inadequate cooling system capacity, but this would be a gradual and controlled management action. Although no outage has yet resulted from this Clean Air Act requirement, this is a strong possibility requiring immediate action.

Economic Aspects: The cost of CFC refrigerants is expected to increase significantly as the supply of CFCs is reduced and as Federal excise taxes on CFCs are increased to discourage CFC use. Deferral of this study and the resultant modifications could eventually lead to increased procurement costs and operating restrictions (including plant shutdown), but this would be gradual and dependent on availability and conservation of CFCs. No significant long term impact is expected after required studies and modifications are completed.

Related Standards: This study is primarily related to Work Management Policies for regulatory compliance (nonNRC) and material condition. Impacts on maintaining material condition involve a fundamental design change for plant cooling systems. Therefore, to maintain design capabilities (functional requirements), forward-looking design evaluations and timely cooling system modifications are required.

TORUS LINER PRESERVATION

## I. PURPOSE AND SCOPE

The purpose of this project is to complete preservation of the torus liner and components. Successful completion of this project will help ensure that the liner will maintain integrity for the life of the plant.

This project includes draining, inspection, and preservation of the Unit 2 Torus. Inspections will include UT measurements of the liner at previously tested location and pit depth measurements to quantify the localized corrosion rate.

## II. EVALUATION

The key assumption is the liner will not last the life of the plant due to localized pitting corrosion. This assumption is based upon the results obtained from underwater inspections on the Unit 1 torus liner. Conditions are expected to be similar for the Unit 2 liner. The reason for excluding the vapor zone from the preservation project is that it is not subject to localized pitting corrosion, and that it will last the remainder of plant life in their present condition.

## III. CONCLUSION

The torus liner will be coated in the next two refueling outages.

## IV. STATUS

The project has been implemention phase approved by the Plant Review Group.

## V. TARGET COMPLETION

October 1995.

PROJECT MANAGER STUART BYRD
PID G0249A

## REACTOR VESSEL CORE SHROUD INSPECTION/REPAIR

### I. PURPOSE AND SCOPE

The project addresses the inspection of the Unit 2 Core Shroud to determine the nature and extent of potential cracking/indications. The project will consist of engineering analyses to address future operation of Unit 2 with the shroud indications (if required), and preparation of modification including fabrication of blocks and fasteners, preparation of design package, crew training, and mobilization ready for installation of bolted clamps.

Project Objectives or Goals and Expected Benefits: The objectives of this project are as follows:

- Characterize the shroud indications and determine their effects on continued operation of Unit 2.
- Perform Engineering analyses to justify continued operation for indications that are not modified.
- Prepare permanent modification for required fixes.
- Fabricate blocks and fasteners for potential installation.
- Disposal of generated radioactive waste.

This inspection and analysis will support continued operation of Unit 2 with no operational constraints.

### II. EVALUATION

This project will ensure the long term integrity of the core shroud and provide a basis for evaluating indications for future inspections.

### III. CONCLUSION

This project will proceed as scheduled.

### IV. STATUS

This project has been implementation phase approved by the Plant Review Group.

### V. TARGET COMPLETION

June 1994.

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| PROJECT MANAGER | VAUGHN WAGONER |
| PID | G0250A |

## HYDROGEN WATER CHEMISTRY

### I. PURPOSE AND SCOPE

Upgrade the Units 1 & 2 Hydrogen Water Chemistry systems to allow the systems to inject enough hydrogen to provide full core suppression of Intergranular Stress Corrosion Cracking (IGSCC) for short periods of time for evaluation of possible future continuous full core suppression injection (referred to a high injection rate, or about 3 ppm of H2 in feedwater). Actual anticipated operating injection rates in the near future are expected to be substantially lower (referred to as moderate injection rates, or 1.2-1.6 ppm of H2), however, due to anticipated need for shielding not yet installed on the moisture separator reheaters (MSRs). In addition, it is possible that the desired effects of full core suppression of IGSCC in the vessel may be obtainable through the use of moderate injection rates coupled with other emerging technologies (e.g., noble metal coatings).

Project Objectives or Goals and Expected Benefits:

1) Mitigate IGSCC in susceptible material in the reactor vessel and attached piping by controlling the electrochemical potential (ECP) and dissolved oxygen concentration in the reactor water.

2) Prevent extended outages and costly in-vessel component repairs and/or replacements (such as the Unit 1 shroud repair), due to IGSCC.

### II. EVALUATION

See project scope and purpose.

### III. CONCLUSION

Industry testing has indicated that this project as described will provide full suppression of IGSCC at a "liveable" radiation level however, it has not been proven over an extended period of time in an operating plant.

Based on the above, the scope of the original project has been reduced from a continuous 100 scfm injection rate to a continuous 40 scfm rate with provisions for short duration 100 scfm runs. This scope reduction has lowered project cost approximately $238K.

### IV. STATUS

This project has been implementation phase approved by PRG.

Modification installation on Unit 1 is complete; performance testing is complete for operation at approximately 20 scfm H2 injection. Unit 1 performance testing at the moderate injection rate is planned in the near future. Unit 1 performance testing at the high injection rate will be performed after the Unit 2 B211R1 outage (i.e., summer 1994). Modification installation is in progress on Unit 2.

### V. TARGET COMPLETION

December 1994.

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| PROJECT MANAGER | CRAIG MARCH |
| PID | G0251A |

REFUEL BRIDGE UPGRADE

## I. PURPOSE AND SCOPE

Refuel bridge upgrades in both units are required in order to increase reliability and safety during outage critical path defueling and reloading. Malfunctions of various refuel bridge equipment have resulted in outage delays.

This project upgrades or replaces the refuel bridge equipment having the most number of failures. For example, this project replaces the mast assembly, platform drive system, control systems, air compressor, and hose take up reels with more reliable equipment. Also, the main hoist motor is being refurbished, the load cells are being replaced with solid state strain gauge type load cells with a continuous digital readout. Several other reliability enhancements are being made in the compressed air system. Obsolete positioning equipment will be removed.

The major part of the work has been completed. The remaining work is to incorporate lessons learned in both Units.

This project will be successful when outage delays due to refuel bridge equipment malfunctions and failures are eliminated.

## II. EVALUATION

Unit availability is affected due to refuel bridge failures extending outage critical paths. Refueling operations are outside the limitations of the PRA model since the current model does not consider plant shutdown conditions.

Nevertheless, refueling accidents are analyzed in the FSAR and are important to nuclear safety. Since the refuel bridge is used in refueling operations with heavy loads over the core and fuel pool, nuclear safety is impacted directly. Personnel safety is also directly impacted due to hoist reliability concerns. A reduction in personnel exposure to radiation is expected due to reduced maintenance requirements in the associated radiation areas. This project is a plant enhancement since it replaces obsolete equipment and reduces maintenance requirements.

Economic Aspects: Costs due to outage delays and maintenance requirements will be significantly reduced by this project.

Related Standards: This project is related to Work Management Policies for material condition and outage management.

Other Considerations: This project does not require an outage to accomplish the physical modifications but does require an outage for in core testing. This project addresses work on Unit 1 under PCN M0066A and, under PCN M0067B, the work on Unit 2.

## III. CONCLUSION

The overall benefits of this upgrade project are significant in that due to improved reliability of the equipment, delays are expected to be reduced during critical path activities of defueling and reloading. This project will be accomplished as scheduled.

PID M0066A
Category II

## IV. STATUS

Project is implementation phase approved by the Plant Review Group.

## V. TARGET COMPLETION

Unit 2 July 1994
Unit 1 June 1995.

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| PROJECT MANAGER | DAN MOORE |
| PID | M0066A |

## SERVICE AND CIRCULATING WATER INTAKE AREA ENHANCEMENT

### I. PURPOSE AND SCOPE

This is a comprehensive project to restore the material condition of the service water system (SWS) and circulating water system (CWS) intake areas and structures. The purpose of the SWS is to provide water from the Cape Fear River for lubrication and cooling of equipment in the Turbine Building, Reactor Building, Diesel Generator Building, chlorination system, and the CWS. The SWS supplies a nuclear header and a conventional header. The purpose of the CWS is to provide water from the Cape Fear River for the main condenser. Due to the relatively humid and corrosive saltwater environment, the physical plant areas and equipment associated with these systems require continued upkeep and preservation. The project includes such work as upgrades to corroded steel structural components, platforms, conduit, cable trays, and handrails; piping repairs and replacement; general repairs to non-corrosive components; refurbishment of instrumentation and control systems; and general area improvements. The objectives of this project are to correct current material problems in the intake areas and to establish effective inspection and maintenance programs that prevent future, significant deficiencies.

The success criteria for this project are that the specified restoration work is completed as planned and that the associated equipment and general areas are returned to a corrosion-free condition.

### II. EVALUATION

Schedule Index: 30 - This project is largely a plant enhancement, but it also affects other attributes. Enhancement of the SWS intake area will improve the system's availability in the event of an accident. If this project is not completed and the intake area not maintained on a continuing basis, the increased probability of a single SWS train being out of service would have a moderate impact on overall SWS availability. Since the SWS is designed to cool critical safety system components directly and can be cross-connected to the residual heat removal system in an emergency to provide additional reactor core flooding capability, this system is very important to nuclear safety. Consequently, this project provides moderate improvement in the availability of a highly important core-damage protection system (0.5 x 32). Corroded platforms and handrails are potential sources of personnel injury; therefore, this project will avoid current conditions from developing into a future concern in this area (0.2 x 29). Unit availability could be affected, but the gradual nature of the degradation and the general ability to make temporary repairs make this a low impact (0.2 x 12). Problems in the CWS can lead to loss of flow to the main turbine condenser, requiring turbine shutdown or loss of thermal efficiency (0.2 x 10). In addition, the SWS intake area facilities are frequently and readily identified as deteriorated, and these conditions are an indication of inadequate maintenance (0.5 x 8).

Economic Aspects: Long-term maintenance of these facilities will require additional annual expenditures above previous maintenance efforts. Thus, the base maintenance program will be expanded in parallel with these improvements in order to meet this obligation. Failure to maintain this equipment could lead to more extensive SWS and CWS problems, and potential damage of equipment cooled or served by these systems.

Other Considerations: Even though each unit has its own SWS and CWS, the intake facilities are common to both units and will require outage work to accomplish some of the electrical work, especially for controls. It is expected that a significant portion of the structural work can be done with the units in operation. Nevertheless, some of the structural work may also be more readily accomplished during outages.

PID P0057B
Category II

## III. CONCLUSION

Failure to maintain control of the material condition of the SWS and CWS facilities could lead to system failures requiring plant shutdown. Deterioration of the intake structure and associated equipment is usually gradual enough that any resultant system failures would be identified during normal operations and would primarily affect unit availability and capacity. Therefore, from a nuclear safety perspective, refurbishment and continued maintenance of these facilities is considered to be mandatory but not urgent. Nevertheless, since continued deterioration of these facilities could result in unit shutdowns, this project is being implemented as scheduled.

## IV. STATUS

This project has been phase approved by the Plant Review Group.

## V. TARGET COMPLETION

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| 92-103 | December 1995. |
| 93-021 | December 1995. |

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| PROJECT MANAGER | CHRIS HUGHES |
| PID | P0057B |

## REACTOR RECIRCULATION SYSTEM CHEMICAL DECONTAMINATION

### I. PURPOSE AND SCOPE

Chemical decontamination of the Unit 2 reactor recirculation system (RRS) will be performed every refueling outage due to the proven and immediate dose savings which will result. The RRS is the largest single contributor to drywell dose rates during outages. The RHR and RWCU systems have a lesser impact on site total exposure such that chemical decon of these systems will be performed initially and not planned to be repeated in near term subsequent years. Dose rates and exposures from these systems will be monitored such that follow-up decontaminations can be planned as necessary.

### II. EVALUATION

This project is expected to save 240 person-rem.

### III. CONCLUSION

This project will be accomplished as scheduled.

### IV. STATUS

This project has been implementation phase approved by the Plant Review Group.

### V. TARGET COMPLETION

June 1994.

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| PROJECT MANAGER | JAY TERRY |
| PID | R0123A |

## SPENT FUEL POOL COOLING ASSIST - PIPING & PENETRATIONS

### I. PURPOSE AND SCOPE

Chemical decontamination of the recirculating system requires a full core off load. Currently, the spent fuel cooling system is not capable of providing cooling for a full core off load until approximately 32 days after shutdown; therefore, the residual heat removal (RHR) system must remain in operation during significant portions of outages in order to provide such cooling. This requirement inhibits RHR system maintenance and prolongs outages. Temporary heat exchangers and cooling towers can be used to supplement the existing spent fuel cooling system and accomplish this cooling function, allowing increased flexibility for RHR maintenance. Since a core off load can be accomplished in about 10 days, the supplemental cooling capability can save about 22 days of outage time. The scope of this project is to install permanent auxiliary fuel pool cooling system penetrations, piping (10-inch supply and return), and valves in the Unit 1 Reactor Building. Unit 2 installation is complete. When this project is completed, the permanent piping may be connected to supplemental spent fuel cooling equipment during refueling outages. Installation and operation of the SSFPC equipment is performed by project R0123I.

### II. EVALUATION

Schedule Index: 18 - The use of permanent piping significantly improves the viability of using an alternate spent fuel pool cooling system. This allows RHR system maintenance flexibility during outages; this minimizes the length of refueling outages, increasing unit availability (1.0 x 12). Permanently installed piping minimizes the need to install and remove temporary system piping, reducing radiation exposure (0.5 x 9). The use of permanent piping and the increased availability of the RHR system without extensive temporary cooling system setup work constitute a plant enhancement (0.2 x 8).

Economic Aspects: The use of permanent piping for supplemental spent fuel pool cooling is more cost effective than the use of temporary piping. Overall, the use of the alternative cooling system for spent fuel cooling allows increased RHR system maintenance and decontamination flexibility, significantly reducing the length of refueling outages.

Related Standards: This project is related to Work Management Policies for human resources and outage management.

Other Considerations: The scope of this project is limited to the installation of permanent piping and valves for the supplemental cooling system.

### III. CONCLUSION

This project will significantly increase the viability of using supplemental cooling of the spent fuel pool, allowing reductions in the length of refueling outages as a result of not having to operate the RHR system for this purpose. The savings are significant, so this project will be completed as scheduled.

### IV. STATUS

Project requires implementation phase approval by the Plant Review Group.

### V. TARGET COMPLETION

December 1994.

PROJECT MANAGER CHUCK RAINES
PID R0123M

| SMALL PROJECT LISTING | | |
|---|---|---|
| PID NUMBER | PROJECT TITLE | TARGET COMPLETION |
| 00918A | REACTOR VESSEL WATER LEVEL INSTRUMENTATION UPGRADE | 12/94 |
| 02549A | SCREEN WASH PUMP UPGRADE | 12/94 |
| *04963A | REACTOR WATER CLEAN UP PUMP | 9/95 |
| 05307A | DC BATTERY LOAD STUDY | 12/94 |
| 05429A | WATER BOX AIR REMOVAL SYSTEM | 6/94 |
| 05806A | RADWASTE EFFLUENT RELEASE LINE REROUTE | 12/96 |
| *05892A | EFFECT OF ELECTRICAL SYSTEM VARIATIONS ON TURBINE GENERATOR TORSIONAL RESPONSE | 12/95 |
| *06650A | REACTOR PRESSURE VESSEL THERMAL CYCLING EVALUATION | 12/94 |
| 06661A | TRANSVERSE IN-CORE PROBE SYSTEM | 12/94 |
| *07438A | REPLACEMENT OF OFF-GAS RAD MONITOR RECORDERS | 12/98 |
| 07848A | REACTOR BUILDING ROOF VENT | 12/94 |
| 08262A | DRYWELL COOLERS LOCA OVERRIDE | 12/94 |
| 12420A | CONTROL BLDG HVAC CONDENSATE MAIN TANK | 6/94 |
| 31856B | FIRE BARRIER UPGRADE | 6/94 |
| 80203A | DIESEL GENERATOR OIL LEVEL ANNUNCIATOR | 12/94 |
| 84489B | 480 VOLT VITAL MCC REWORK | 12/94 |
| G0015A | SMALL MODS | 12/96 |
| G0050A | SERVICE WATER TASK ACTIVITIES | 12/94 |
| G0075A | LOCAL POWER RANGE MONITOR CABLE REPLACEMENT | 12/95 |
| G0083A | INSTRUMENT AIR COMPRESSORS | 12/94 |
| *G0159A | REMOVAL/ANALYSIS OF RPV INVESSEL IRRADIATION | TBD |
| G0218A | MAKE TEMPORARY POWER FEEDS PERMANENT | 12/95 |
| G0237A | REACTOR WATER LEVEL REFERENCE LEG CONTINUOUS BACKFILL | 6/94 |

* These projects require design and implementation phase approval by the Plant Review Group. All other projects are design and implementation phase approved.

## SUMMARY STATUS OF SMALL PROJECTS

## SUMMARY OF ACCOMPLISHMENTS

An operations radio communication system was completed which provides improved communications from the control room to equipment areas. This will enhance operators performance in responding to plant events such as a fire. Work was completed on the Caswell Beach pumping stations structural issues, the fish diversion screen upgrade and the plant road intersection.

Fifteen (15) projects have canceled.

## SMALL PROJECTS CANCELED:

| PROJECT# | PROJECT TITLE | CAT. | EXPLANATION |
|---|---|---|---|
| 04421A | Reactor Recirculating Pump Seal Leakage Monitoring | II | Other methods are available to monitor seal performance. |
| 06817A | Heater Bay Gantry Crane Improvement | II | Crane has adequate high wind protection. |
| 07768A | Install Shielding Enclosure for the Crack Arrest Verification System | II | Continuous monitoring of CAV is not required with the addition of hydrogen water chemistry. |
| 07970A | Ventilation Fan Air Flow Switch Deletion | II | Other means of monitoring fan performance are available. |
| 08041A | Installation of Banana Test Jacks on APRM Recirc Flow Units | II | An engineering evaluation exists that allows maintenance to install banana jacks to perform testing. |
| 08083A | Installation of Sight Glass in RFPT Lube Oil Filter Vent Lines | II | System performs intended function as is. |
| 08377A | HPCI/RCIC Logic Enhancement | II | HPCI/RCIC system performs as required. |
| 08383A | Diesel Jacket Water Expansion Tank Improvement | II | Tank supply valves were replaced via an engineering evaluation. |
| 08437A | Turbine Building Misc Temperature Switch Improvements | II | Mounts were evaluated and are not required to be seismic. Heater elements were replaced by an EER. |
| 84849A | Replace the Electric Fire Pump Controller | II | Issue to be resolved via direct replacement with routine engineering support. |
| G0068A | Install Alternate Biocide System | II | Available alternate biocide was tested and found to be ineffective. |
| G0125A | 125 Volt Battery Charger Amplifier Board Redesign | II | Battery charger performs intended function. |
| G0216A | Removal of 20' & 50' Calibration Head Tanks | II | Issue to be resolved via an equipment decommissioning with routine engineering and maintenance support. |

| PROJECT# | PROJECT TITLE | CAT. | EXPLANATION |
|---|---|---|---|
| G0217A | Permanent Auxiliary Steam Piping for HPCI and RCIC Testing | II | HPCI/RCIC testing will be accomplished with a temporary modification which is installed during the outage and removed. |
| G0223A | Reactor Instrument Maintenance Test Provisions vs. RHR and CS Tech Spec Requirements | II | Transmitters are performing satisfactorily. |