APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

NRC Inspection Report No. 50-458/92-10

Operating License No. NPF-47

Licensee: Gulf States Utilities (GSU)
P.O. Box 220
St. Francisville, Louisiana 70775

Facility Name: River Bend Station (RBS)

Inspection At: RBS, St. Francisville, Louisiana

Inspection Conducted: March 9-13, 1992

Inspectors: M. Runyan, Acting Team Leader, Plant Systems Section
Division of Reactor Safety

R. Vickrey, Reactor Inspector, Plant Systems Section
Division of Reactor Safety

C. Paulk, Reactor Inspector, Plant Systems Section
Division of Reactor Safety

L. Smith, Senior Resident Inspector, Arkansas Nuclear One
Division of Reactor Projects

Approved: T. F. Westerman 4-22-92
T. F. Westerman, Chief, Plant Systems Section — Date
Division of Reactor Safety

Inspection Summary

Inspection Conducted March 9-13, 1992 (Report No. 50-458/92-10)

Areas Inspected: Regional initiative, announced inspection consisting of evaluating engineering and technical support activities.

The engineering organization was reviewed for organizational structure and interfaces, manpower and work backlogs, scheduling and prioritization of work activities, and qualification and training. The quality of the engineering performed was evaluated by reviewing completed station modification and design change work packages. The QA audits and assessments of the engineering and technical support organization and the actions taken with respect to the assessments and audit findings were reviewed.

Results: The modification process was found to be well proceduralized and functioning in accordance with regulatory requirements (paragraph 2.1.1).

NSAC-125, "Guidelines for 10 CFR 50.59 Safety Evaluations," had been incorporated into the applicable engineering procedure, which was observed to improve the detail in the documented evaluations. Earlier safety evaluations in accordance with 10 CFR 50.59 were noted by the team to have been narrow in scope. The licensee was informed that the NRC staff has not given final approval and that there may be further review of NSAC-125 (paragraph 2.1.1).

During the inspection, problems were noted with the training of engineering personnel for performance of safety evaluations, and the review and approval of changes to drawings by engineering prior to issuance; however, the licensee demonstrated that their QA organization had previously identified the problems and that corrective action was in progress (paragraph 2.1.1).

Engineering dispositions performed in response to condition reports were generally conservative and well documented. One example was identified, however, where information critical to the validity of a use-as-is disposition was not referenced. The utilization of the root cause analysis process for condition reports appeared to be limited because of a high threshold criteria. The attachment of several change notices to the front of procedures with no notations within the procedure made using the procedures cumbersome and subject to procedural error (paragraph 2.1.2).

The prompt modification request (PMR) process was well proceduralized and was functioning properly. Control room drawings were noted to have been appropriately marked. A field walkdown of PMRs identified no discrepancies (paragraph 2.1.3).

The inspectors observed confusion on the part of a shift supervisor as to when work could start or had started on a PMR. It was observed that operations did not have a focused list which indicated which PMR/MRs had been released for work. After the inspection, the licensee initiated a process to provide the control room with the status of PMR/MRs (paragraph 2.1.3).

There were eleven permanent cooperative student program (Co-op) positions in the nuclear group and the licensee indicated that the use of Co-ops has been successful (paragraph 2.2.1).

The licensee has a very strong engineering analysis group with limited dependence on architectural engineering, nuclear steam supplier, and other vendor analysis capabilities. Over 70 software codes are utilized by this group and they have submitted topical reports to obtain NRC approval to perform reload analyses (paragraph 2.2.4).

Design work is generally performed by the onsite design engineering organization with a significant dependence on contract engineering employees. The design engineering department appeared to be functioning well and morale was high (paragraph 2.2.7).

The licensee has a high reliance on the utilization of contract engineering personnel. Indications by licensee personnel of a potential reduction of contract engineering employees will warrant management attention to assess the impact upon the effectiveness of the design engineering organization (paragraph 2.2.7).

System Engineering was reorganized in early 1990. The selective reduction in the number of systems assigned had a significant impact on reducing system engineering workload and providing for better system support. Training was a strength. Training was given high priority, with sufficient time being allotted and the certification process was comprehensive. The past high turnover rate and subsequent loss of experience was acknowledged by the licensee. Management attention and support appeared to be focused on correcting this shortcoming (paragraph 2.2.8).

Technical staff and management have a well-defined training action plan which is monitored and reviewed on a monthly basis. Emphasis was being placed on identification of weaknesses, correcting them, and implementing the action plan in a timely manner. The efforts and improvements in the technical staff and management training programs appeared to be a strength (paragraph 2.2.9).

The central coordination of assessments within the oversight organization was a strength. The quality assurance organization and the degree of involvement in the engineering processes was also a strength (paragraph 2.2.10).

The River Bend Action Plan was observed to be a living document that is reviewed monthly by senior management. The engineering and technical support area is one of 40 action items being pursued for improving performance. Drawing changes and vendor documents were two areas reviewed where enhancements are being implemented. Progress in the area of vendor document adequacy has been delayed pending contractor selection (paragraph 2.2.11).

During this inspection, an inspection followup item was identified concerning the design controls applied to "repair" and "use as is" dispositions (paragraph 2.2.12, Inspection Followup Item 458/9210-01).

DETAILS

1. PERSONS CONTACTED

*T. Anthony, Supervisor, Performance, Programs, and Testing
*R. Backen, Supervisor, Quality Assurance (QA) Systems
*W. Beck, Nuclear Steam System Supplier (NSSS) Supplier
*J. Booker, Manager, Nuclear/Industry Relations
G. Bysfield, Assistant Plant Manager - Systems Engineering
J. Campbell, Technical Specialist, Balance-of-Plant (BOP) Design
R. Cole, Control Process Systems Supervisor (Acting)
*J. Cook, Technical Specialist, Licensing
D. Davenport, Nuclear Training Coordinator, General Employee Training (GET)
R. Davey, Principal Engineer, Electrical and Special Projects
*L. England, Director, Nuclear Licensing
L. Engle, Senior Mechanical Engineer
T. Fredieu, Maintenance Support Supervisor
R. Gaylor, Director Computer Services
*K. Giadrosul, Supervisor, Quality Engineering
D. Glueck, Senior Mechanical Engineer
*P. Graham, Plant Manager
H. Grimes, Senior Equipment Qualification Engineer
O. Gurgis, Senior Mechanical Engineer
J. Ham, Senior Mechanical Engineer, BOP Design
*J. Hamilton, Director, Design Engineering
B. Hayes, Systems Engineer
T. Hoffman, Supervisor, Civil/Structural Design
T. Hunt, Senior Nuclear Safety Engineer
R. Kelly, Senior Systems Engineer
*G. Kimmell, Director, QA
M. Laris, Senior Systems Engineer
J. Leavines, Supervisor Nuclear Safety Assessment
*D. Lorfing, Supervisor, Nuclear Licensing
*I. Malik, Supervisor, Operations QA
R. Martin, Lead Senior Systems Engineer
*J. McQuirter, Licensing Engineer
*J. Mead, Supervisor, Electrical/Special Projects
*J. Miller, Director, Engineering Analysis
T. Moffitt, Senior Electrical Engineer
B. Neff, Electrical Engineer
A. Nguyen, Senior Mechanical Engineer
*W. Odell, Manager, Oversight
*S. Radebaugh, General Maintenance Supervisor
R. Roberts, General Maintenance Supervisor (Acting)
T. Rouns, Senior Civil Structural Engineer
J. Salmon, Senior Technical Specialist, Performance, Programs, and Testing
L. Sandlin, Technical Specialist, Electrical and Special Projects
*M. Sankovich, Manager, Engineering
V. Shertekde, Senior Electrical Engineer

*J. Shippert, Assistant Project Manager, Operations, Radiological Waste,
*A. Soni, Supervisor, Equipment Qualification and Specifications
*M. Stein, Supervisor, BOP Design
*K. Suhrke, General Manager, Engineering and Administration
C. Walling, Mechanical Process Systems Supervisor
*A. Wilson, Senior Technical Specialist
C. Womack, Control Systems Supervisor
*G. Young, Reactor Engineering Supervisor

NRC

*E. Ford, Senior Resident Inspector, RBS

* Indicates those persons who attended the exit meeting conducted on March 13, 1992.

2. ENGINEERING AND TECHNICAL SUPPORT ACTIVITIES

The inspectors evaluated the effectiveness of the River Bend engineering and technical support programs in the areas of adequacy of staffing levels and experience, training, design changes, and quality assurance (QA) audits. The evaluation consisted of documentation reviews and personnel interviews to verify that the license requirements included in the Technical Specifications (TS) and codes and standards were being implemented and that the commitments contained in the Updated Safety Analysis Report (USAR) and other correspondence were being followed.

2.1 Design Changes and Modifications (37700 and 37702)

2.1.1 Modifications

The inspectors reviewed Procedure ENG-3-006, Revision 8, "River Bend Station Design and Modification Request Control Plan," and concluded that it met the applicable regulatory requirements. A review of Procedure ENG-3-004, Revision 1, "Safety and Environmental Evaluations," was performed and it was found acceptable to direct safety evaluations in accordance with the guidance of 10 CFR Part 50.59.

The following modification packages were reviewed to determine if modifications and safety evaluations were being performed in accordance with plant procedures and regulatory requirements:

MR-87-0651 - Replace 1 Ampere Fuses for SRM/IRM Motors
MR-86-0531 - Change Setpoints on HCUs Using Startup Data
MR-89-0243 - Replace Dual Coil Solenoid Valves on MSIVs
MR-89-0019 - Change Main Steam Tunnel High Temp Alarm Setpoint
MR-90-0063 - Change Fuse Size in Control Circuit for Feedwater Pump

The modification process was found to be well proceduralized and properly functioning in accordance with regulatory requirements.

The licensee had incorporated NSAC-125, "Guidelines for 10 CFR 50.59 Safety Evaluations" into the applicable engineering Procedure ENG-3-004 which was observed to improve the detail in the documented evaluations. Earlier safety evaluations in accordance with 10 CFR Part 50.59 were noted by the inspectors to have been narrow in scope. The licensee was informed that the staff has not given a final approval to NSAC-125 and that there may be further reviews of NSAC-125.

A weakness was identified in the modification program relating to the training for the performance of the safety evaluation screening process. It was determined that the licensee had previously identified this weakness in quality assurance audit number 92-01I-PTQL/TRNG. Quality assurance finding reports (QAFRs), P-92-01-009 and P-92-01-010, were issued on January 31, 1992, to address requalification training for those individuals that perform safety evaluation screening and unreviewed safety question determinations. In response to the QAFRs, the licensee identified those people that needed the training, created a matrix for the training requirements, and established a training plan in accordance with TPP-7-025, Revision 2, "Technical Staff and Technical Staff Managers Training Program." The training plan is scheduled to be completed by April 1, 1992, with training scheduled to begin in July 1992.

A weakness was identified in the control of drawings affected by modifications during the review of Procedure ENG-3-006. It was determined that the licensee had already identified this weakness in quality assurance audit number 91-10-I-DCON performed by GSU in October 1991. QAFR P-91-10-01? was issued to address the fact that change documents (i.e. modification requests and design change notices) were incorporated without a final engineering review and approval. The licensee has taken actions to require engineering review and approval before a modification package is closed out.

Conclusions:

The modification process was found to be well proceduralized and properly functioning in accordance with regulatory requirements.

The licensee had incorporated NSAC-125 into its engineering procedures. This was observed to improve the detail in the procedures that had not previously existed. Earlier safety evaluations were noted by the inspectors to have been narrow in scope. The licensee was informed that the staff has not given a final approval to NSAC-125 and that there may be further revision.

Problems were identified with the training for performance of safety evaluations, and the review and approval of drawings by engineering prior to issuance. However, the licensee demonstrated that QA had previously identified the same problems and that corrective action was in progress.

2.1.2 Review of Condition Reports

To document the engineering dispositions of nonconforming conditions the licensee uses Procedure RBNP-030, Revision 0, "Initiation and Processing of

Condition Reports," and Procedure EDP-AA-30, Revision 3, "Processing Condition Reports Within Engineering."

The inspectors reviewed 15 condition reports which had been assigned to design engineering for disposition. Procedural controls were followed in the examples reviewed and engineering dispositions were generally conservative and well documented. One exception was Condition Report 91-0357, dated September 25, 1992, which documented an abnormal fouling and resultant heat transfer degradation of the residual heat removal (RHR) heat exchangers. The condition report summarized September 1991 test data on the Division 1 RHR heat exchanger which showed a heat transfer capability of 123.0 E +6 BTU/HR. The condition was considered to be acceptable at least until the planned refueling outage in March 1992, but the basis for concluding that no further degradation would occur during the interim period was not well supported. When questioned, the licensee supplied a calculation dated August 14, 1991, which showed that the plant's design basis would be maintained at a heat transfer rate of 110.886 E +6 BTU/HR in the RHR heat exchanger. This additional information resolved the inspectors's operability concern but represented an example of the failure to reference information critical to the validity of a use-as-is disposition.

A weakness was identified with respect to utilization of the root cause analysis process for condition reports. Procedure (RBNP-030) required performance of a root cause analysis for significant conditions adverse to quality, reportable conditions, pressure boundary problems, and at the plant manager's discretion. Several of the condition reports described problems, which though not meeting the procedural requirements for root cause analysis, were of a precursor nature that may indicate significant problems. Only one of the 15 condition reports reviewed was analyzed for root cause which indicated that the process was limited in utilization due to the high threshold criteria. On a related topic, it was noted that a least one individual who had performed root cause analyses had not received the onsite training on this subject.

Another weakness identified during this review was the human factors state of plant procedures. Procedure RBNP-030 "Initiation and Processing of Condition Reports" was an example of this problem. Three interim change notices (ICNs) had been issued against the procedure, modifying large portions of the procedure. However, none of the ICNs are annotated in the procedure to alert a user to the presence of revised text. The user would have to check the three ICNs individually to assure that the procedural item of interest was still in effect. The inspectors concluded that procedures in this condition were cumbersome and may result in procedural errors.

Conclusions:

The root cause analysis process for condition reports appeared to be limited in use due to a high threshold criteria for performing root cause analysis.

The attachment of several change notices to the front of plant procedure with no annotation within the procedure made the use of the procedure cumbersome and subject to procedural error.

2.1.3 Prompt Modifications Requests (PMR)

The following five open safety-related prompt modifications requests (PMRs) were selected for review:

- PMR 88-0021, Modify the Probe Data Receiver Card in 1H13*PNLP652 so that the redundant Division II portion of the Rod Control Information System remained operable.
- PMR 89-0006, Install one operating and one standby diesel driven compressor to the instrument air system to supply the instrument air and service air systems with pressurized air during Refuel-2.
- PMR 89-0025, Reroute power to 1SCM*PNL01B following a transformer failure.
- PMR 89-0026, Replace failed Transformer 1RPS*XRC10B1.
- PMR 91-0017, Service water piping modifications to facilitate chemical cleaning and replacement service water piping.

Drawings in the control room were reviewed to ensure installed modifications had been appropriately marked. There were no discrepancies noted.

The inspectors interviewed the shift supervisor (SS) regarding the method of maintaining status of PMRs which had been released for work. The SS stated that the operating staff had access to the PMR status report which listed those PMRs that had been released for work by design. The SS further stated that the operating staff also logged those maintenance work orders that caused entry into Technical Specification (TS) action statements.

The inspectors confirmed that the operating staff had correctly statused PMR 89-0025, PMR 89-0026, and PMR 91-0017 by direct observation of the installed plant equipment. One weakness was noted with PMR 91-0017. The PMR status report indicated that design engineering had completed all reviews and released the PMR for work on August 15, 1991. The quality manager stated that portions of the PMR were already in progress in the field although there were no activities that would impact a TS LCO. The SS was not aware that work had started on PMR 91-0017. The inspectors verified that the SS was correct in that no activity had taken place as a part of PMR 91-0017 that would impact a TS LCO.

The SS stated he would have to call maintenance or planning to identify which PMRs had been "Field Work Released" by design but were not actually in-work, if the PMR did not result in entry into a Technical Specification. The SS stated that the control room critical drawings listed modification requests (MRs) and PMRs which had been released for work by design without regard to actual in-work status. The SS stated control room critical drawings were annotated as MRs and PMRs were completed and that no list existed of MRs and PMRs that had been released for work by operations. The inspectors determined that operations did not have a concise status of all field work in process. The licensee informed the inspectors by subsequent telephone call that a program to cross-reference in-process MRs and PMRs in the control room had been instituted to address this weakness.

The inspectors performed a field verification of PMR 89-0025 and PMR 89-0026 to confirm that the prompt modifications were installed in accordance with the description in the packages. There were no discrepancies noted. The inspectors observed that a prompt modification tag was hung on PMR 89-0025 but not on PMR 89-0026. The inspectors found that Procedure ENG-3-006 no longer required tags to be hung as a method of controlling prompt modification installations. The procedure did contain a requirement to remove old prompt modification tags as the PMRs were closed.

The inspectors reviewed Procedure ENG-3-006 to identify the current method for controlling the installation of PMRs. The procedure required that an anticipated cancellation date for the PMR be determined within three working days of sign-off of the PMR as "Field Work Released" by design. The procedure further required the design engineer to justify all extensions with approval by the Engineering Director or Manager. The extension requests were required to include consideration of the aging of temporary materials, corrosion, and required maintenance and calibration. The procedure further required that the PMRs either be converted to a MR or cancelled (change reinstated to original configuration) by the cancellation date.

Procedure ENG-3-006 also required that PMRs be kept to a minimum. On March 12, the PMR status report indicated that 52 PMRs had been "Field Work Released" by design engineering. Ten of the 52 had been initiated more than 2 years ago. The licensee planned to remove most of these 10 PMRs during Refuel-4, the refueling outage which began during the inspection period.

The licensee used maintenance work orders to implement maintenance and modification activities. The inspectors reviewed a computer listing of all maintenance work orders closed within the last 6 months to verify that all modifications had been appropriately authorized. No additional discrepancies were identified.

Conclusions:

Engineering dispositions performed in response to condition reports were generally conservative and well documented, though one example was identified where information critical to the validity of a use-as-is disposition was not properly referenced.

The inspectors observed that the PMR process was well proceduralized and was functioning properly. Control room drawings were noted to have been appropriately marked and a field walkdown of PMRs identified no discrepancies.

The inspectors observed that there was confusion on part of a SS with regard to when work could start or had started on a PMR. It was observed that operations did not have a focused list which indicated those PMR/MRs that had been released for work. The licensee informed the inspectors subsequently that they had initiated a process to provide the control room with the status of PMR/MRs released for work.

2.2 Offsite Support Staff (40703)

2.2.1 River Bend Nuclear Group

There were three engineering departments plus two special groups that make up the River Bend Nuclear Group. The department directors and supervisors of the special groups reported to the Manager River Bend Engineering. The manager reported to the General Manager River Bend Engineering who in turn reported to the Vice President River Bend Nuclear Group. Plant engineering was a separate department reporting through the plant manager. As of December 31, 1991, there were a total of 179 filled positions in the River Bend Nuclear Group with an approved complement of 110 employees. The filled positions included 52 contract employees and 19 Stone and Webster (S&W) employees. The departments were computer engineering, design engineering, and engineering analysis. The special groups included equipment qualification and specifications, and reliability systems. The inspectors noted that 11 permanent Co-op positions were being utilized within the engineering organization. The licensee indicated that the use of Co-ops had been successful and that there were 25 professional registered engineers on staff.

A River Bend Five Year Comprehensive Business Plan is revised yearly by the licensee. The plan is a living schedule which integrates the engineering activities with the plant schedules and the station budget. The plan included site and departmental objectives, generation plan, human resources/staffing, financial, and major projects.

In addition to the River Bend Five Year Business Plan, the licensee had a River Bend Management Action Plan which was first developed in June 1991 to address River Bend improvements. This plan was intended to be a continuing management tool and is further discussed in paragraph 2.2.11.

2.2.2 River Bend Nuclear Group Procedures

The general hierarchy of procedures at River Bend was the nuclear procedures manual which governed the station administrative manual (comprised of the general administrative procedures, section procedures, and section work instructions), the QA administrative procedures and QA/QC instructions, the engineering procedures, and the station report manual. Within engineering there were administrative procedures (with designation AA such as EDP-AA-xx, NuPE-AA-xx, and IPC-AA-xx), engineering administration procedures (with designation EA such as NuPE-EA-xx), electrical engineering procedures (with designation EE such as EDP-EE-xx, and IPC-EE-xx), mechanical engineering procedures (with designation ME such as EDP-ME-xx, NuPE-ME-51, and IPC-ME-xx), nuclear engineering procedures (with designation NE), civil structural (with designation CS), computer systems procedures (with designation CC), engineering analysis procedures (with designation AN), core analysis procedures (with designation CA), equipment qualification procedures (with designation EQ), and reliability systems procedures (with designation RS). The station engineering organization was delineated in the station administrative manual.

2.2.3 Computer Systems

The computer systems organization had 17 personnel (system/analyst engineers) and one contract analyst assigned based on a December 31, 1991, organization chart. The organization consisted of a computer systems group and an application and support group. A supervisor for each of these groups reported to the Director-Computer Systems. The computer system organization was responsible for providing engineering support for various plant computer systems and site data processing; and support related to computer usage for design, procurement, installation, startup, operation, maintenance, training, documentation, modifications, new designs, and replacements. This group provided centralized computer support for the entire site with exception of the software utilized by the engineering analysis group.

2.2.4 Engineering Analysis

The engineering analysis organization had 21 engineers, and eight Co-op engineering positions based on a March 1992 organization chart. All 21 were indicated to have degrees with an average engineering experience of 10 years of which 9 years was nuclear related. The organization consisted of a thermal/hydraulics group, core analysis group, probabilistic risk assessment/radiological analysis group, and a senior nuclear engineer position. A supervisor for each of the groups identified above reported to the Director-Engineering Analysis. This organization was responsible for analyzing various operational transients, performing reload safety and accident analysis, support for thermal-hydraulic analysis, probabilistic risk assessment, design engineering thermal-hydraulic behavior of fluid in piping systems, and shielding and radiological release rate determinations. They were also responsible for nuclear fuel engineering services for fuel management, engineering, and design safety. This included reactor physics, core model development, code and method development, and support of safety analysis, fuel performance, fuel contracts, warranties, QA, fuel movement, shipments, accountability, and core component management. This group provided much of the architectural engineering, nuclear inspectors supplier and other vendor analysis capabilities within the licensee's own organization. The licensee had submitted their own topical for approval by the NRC to perform their reload analyses on site. The licensee stated that there were approximately 70 software codes utilized by this group. Of these, eight had complete compliance software packages. The other software will then be qualified on a case by case basis as part of the individual calculation package prior to utilizing the software. The licensee indicated that its Individual Plant Evaluation was on schedule. There were plans to significantly increase the computer capacity within this group to eliminate dependence on the mainframe.

2.2.5 Equipment Qualification and Specifications

The equipment qualification and specification group consisted of 11 engineers and specialists, and 11 contract employees based on a December 31, 1991, organization chart. There were indicated to be 11 engineers with degrees and 19 years average engineering experience and 16 years average nuclear experience. This group ensured that safety related equipment could operate under postulated seismic, dynamic, and environmental conditions. They provided the technical and quality requirements for the procurement of spare and replacement parts. This group also maintained the quality list.

2.2.6 Reliability Systems

The reliability systems group consisted of three engineers based on a December 31, 1991 organization chart. This group was responsible for the implementation and reporting of Nuclear Plant Reliability Data System for station utilization and the System Reliability Program.

2.2.7 Design Engineering

The design engineering organization consisted of 47 engineers and 55 contract employees. Excluding the performance programs and testing group, there were 39 design engineers and 45 contract employees based on a December 31, 1991 organization chart. The data provided by the licensee indicated that there were 47 engineers with degrees and an average engineering experience level of 16 to 19 years, and 11 to 14 years River Bend nuclear experience. This organization consisted of the balance of plant design group, the civil/structural design group, the electrical and special projects group, the nuclear inspectors supplier group, and the performance programs and testing group. A supervisor for each of these groups reported to the Director-Design Engineering. This organization was responsible for the electrical, civil/structural, nuclear steam system (NSS), and balance-of-plant (BOP) design. In addition, plant performance and testing was performed under this group. They had the responsibility for assuring that the plant design was maintained within the established design licensing basis. This included all proposed modifications and enhancements. All performance monitoring and trending implementation was the responsibility of this group. All design was performed by this organization with a significant dependence on contract engineering employees. Indications by licensee personnel of a potential reduction of contract engineering employees will warrant management attention to assess the impact on the effectiveness of the organization.

2.2.7.1 Interview of Design Engineering Personnel

The inspectors interviewed 20 design engineering department supervisors and engineers assigned to the civil-structural, BOP, electrical, NSS, performance programs and testing thermal/hydraulic analysis, probabilistic risk assessment (PRA) analysis, equipment qualification and specifications, and reliability systems engineering groups. The interviews were conducted for the purpose of determining how the engineering staff was functioning.

Overall, those interviewed expressed a positive assessment of design engineering and appeared to have high job satisfaction, good morale, and team cooperation. Most reservations or complaints were couched with words to the effect that the situation was improving, or that the expressed problems no longer existed. Training provided to the employees was viewed as sufficient in quantity and effective in quality. In addition to instruction in root cause analyses, safety evaluations, and operability determinations, most employees had also received technical training including off-site contracted courses and attendance at industry seminars and conferences.

A unanimous consensus was received regarding the technical expertise and managerial skills of the design engineering director and supervisors. All engineers expressed positive remarks about their immediate supervisor and director and stated that these individuals were accessible and would listen to them. This manager-employee relationship, and the mutual respect observed, was viewed as a strength in the organization.

Staffing levels of the engineering groups appeared to be appropriate for the work load. Overtime averaged 10 percent or less, backlogs for condition reports and plant modifications had been reduced to manageable levels.

The staff's average nuclear experience was about 10 years. Individuals possessing "engineer" titles had degrees in an engineering or technical discipline. Technical specialists were non-degreed, highly experienced individuals who, on a case-by-case basis, performed tasks generally reserved for engineers.

The presence of a large contractor work force was a source of some concern for those interviewed. These comments applied primarily to those contractors who had been on site for a considerable period of time, functioned essentially as direct employees, and received additional compensations.

Within the design engineering organization, the various groups appeared to have good communications and team work. In a like manner, most interviewed stated that working relationships between design engineering and other departments was excellent.

Some of those interviewed expressed a concern that modifications, once completed by design were not installed in a timely manner. This condition, which was apparently created by resource and opportunity limitations, negatively influenced the natural desire to see ones' work come to fruition.

The majority of the engineers interviewed expressed some dissatisfaction over the condition of their workspace. Most engineers shared a small cubicle with a fellow engineer and stated that noise levels were often high enough to disrupt their productivity.

Conclusions:

The licensee had 11 permanent Co-op positions in the nuclear group and had indicated that the use of Coops has been quite successful.

The licensee was viewed to have a very strong engineering analysis group with the capability to provide in-house analysis with limited dependence on architectural engineering, nuclear inspectors supplier and other vendor analysis capabilities. There were over 70 software codes utilized by this group. The licensee had submitted topical reports to obtain NRC approval to perform their own reload analyses.

Design work was generally performed by the onsite design engineering organization, with a significant dependence on contract engineering employees.

It was observed that any planned reduction of contract engineering employees will warrant management attention to assess the impact on the effectiveness of the design engineering organization.

2.2.8 System Engineering

The Assistant Plant Manager - System Engineering (APM-S) reported to the plant manager. The staff consisted of four sections, control systems, control process systems, mechanical process systems, and reactor engineering, reporting to the APM-S. The staff consisted of 32 budgeted engineer positions with four vacancies.

In February 1990, a reorganization took place. Prior to this, the department "System Engineering" did not exist under plant staff. Instead, a group called "Field Engineering" existed which had a complement of 61 people. This group was totally reorganized.

In conjunction with the reorganization, the specific systems assigned to system engineering were determined through an evaluation process. All other systems were given limited support from system engineering and were, therefore, required to be given additional support from other organizations. At the current time, there were 56 system responsibilities assigned to the system engineers.

System engineering has been subjected to a very high attrition and had initiated several corrective actions to reduce the impact of the high turnover rate. Improvements had been made and were being implemented in the training program. System notebooks were being developed which would provide for good turnover to future system engineers. System engineers were developing system improvement plans.

The system notebooks were working documents intended to be a ready reference of latest system status. The notebooks were to be maintained current such that, in the absence of the system engineer, there would be sufficient information available to allow the backup system engineer to support operations and maintenance.

The system engineering training program was well developed, had good management support, and was being fully implemented. Assigned training classes were considered mandatory and of top priority. Each system engineer assigned primary or backup system responsibilities was required to be certified by means of a system certification card. As a part of the final certification process, they were given an oral qualification board. Most system engineers had completed certification on their primary systems.

System improvement plans were being developed by the system engineers to summarize problems which would require some modification of equipment or procedures, or which would require maintenance work of a very long range nature. System improvement plans were included in the system notebooks and were periodically reviewed by system engineering supervisors.

Conclusions:

The selective reduction in the number of systems assigned to system engineering had an impact on reducing system engineering workload and providing for better quality system support. Training was a strength in that sufficient time was being allotted, it was given high priority, and the certification process was comprehensive. Although the past high turnover rate and subsequent loss of experience appeared to be a weakness, management attention and support appeared to be focused on correcting the problem.

2.2.9 Technical Staff and Management Training

The inspectors reviewed the licensee's training program for technical staff and management. The licensee had established a training action plan. This action plan addressed technical staff and management training in two sections. The first section was an "accreditation renewal action plan." The section objective was to correct shortcomings in the existing program. The licensee's goal was to achieve that objective in 1992 with no significant findings of weaknesses. The training department had responsibility for drafting a self-evaluation report (SER) to be approved by appropriate plant staff and engineering department personnel. The action plan included the establishment of appropriate training review groups. The technical staff and management training review group chairman alternated between the APM - System Engineering and the Design Engineering Manager.

Conclusions:

The licensee has established a well defined training action plan. This plan was being monitored and reviewed on a monthly basis. Emphasis was being placed on identification of weaknesses, correcting them, and implementing the action plan in a timely manner. The licensee's efforts and improvements in the technical staff and management training programs was a strength.

2.2.10 Assessments

Assessments were performed by the licensee's oversight organization which reported directly to the Senior Vice President River Bend Nuclear Group. These were performed by two of the three groups within the oversight organization. The nuclear safety assessment, which included the independent safety evaluation group, conducted ongoing assessments of plant related activities. This group also trended nonconformances, condition reports, and quality assurance finding reports (QAFRs). The manager of oversight presented an executive summary, including the trends, to senior management every quarter. The oversight group stated that functional assessments were being planned for this year to include engineering and technical support. Each functional area would then be assessed on a 24 month cycle.

Within the quality assurance organization, the inspectors found that audits and safety system functional inspections (SSFIs) were performed yearly within engineering. There were also mini SSFIs performed on a 2 month schedule (approximately six per year). Audit summaries contained QAFRs and observations. The inspectors noted from the audits reviewed that a QAFR was a compliance-related finding and an observation was essentially an assessment finding. Both QAFRs and observations required replies. The audit reports and mini-SSFIs reviewed by the inspectors were observed to be quality products.

Conclusions:

The central coordination of assessments within the oversight organization was a strength. The quality assurance organization and the degree of involvement in the engineering processes also was a strength.

2.2.11 Engineering Initiatives

In addition to the major projects identified as part of the Five Year Comprehensive Business Plan as discussed in paragraph 2.2.1, the inspectors found that the licensee had established in June 1991 a River Bend Action Plan that covered 29 areas as of revision 9 (December 13, 1991). The action plan was a management tool issued to the foreman level. It was intended to provide management with a tool to improve River Bend performance. Each plan contained an objective, goal, responsibility, monitoring, and action plan status. The plan was reviewed each month at the senior staff meeting and was considered to be a living document Action Item 29 was designated for the engineering/technical support area and consisted of 40 individual items. These included the following:

- Engineering Training
- Engineering Interface and Communication
- Support Plant Operations (Equipment Qualification and Specifications)
- Fire Protection
- Quality of Engineering Products
- Design Bases Document Improvements
- Control of Contractors of Engineering Services
- Documentation Review
- Performance Programs & Testing Support of System Engineering
    - Performance Monitoring
    - Oil Analysis
    - Vibration Analysis
    - Plant Heat Rate
    - Motor Operated Valves
- Engineering Analysis Support
    - Plant Staff
    - Radiological Controls
    - Maintenance/Surveillance
    - Emergency Preparedness
    - Engineering/Technical Support
    - Safety Assessment/Quality Verification
- Control of Drawing Revisions
- Adequacy of Vendor Documents
- Impact on Plant During Installation of Modifications
    - System Engineering Training Action Plan
- Technical Support Training
- Engineering Plan to Ensure Mark Number Consistency (Q-List)
- Parts Verification Program

The inspectors's review of engineering design document backlogs indicated that there was a significant number of outstanding drawing changes (approximately 5503 outstanding changes of which only 52 were delinquent based on licensee time limits for incorporating changes). This was also a previous SALP item. In response to the inspectors's questions, reference was made to the action plan individual item "Control of Drawing Revisions". The objectives of this item were to reduce the backlog of outstanding drawing revisions, to provide a more efficient revision control and indexing system, and to improve end user retrievability of drawing and document information. A review of this item indicated that, since the issuance of Corrective Action Report 90-02, the actions taken by the licensee include the following: three contract draftsmen were hired in 1990; corporate office drafting was relocated to the site; six additional draftsmen were added in 1992; a large document capability imaging system is to be installed by the end of April 1992 which will allow a faster edit function (system will provided one day processing); red-line drawings were provided in the document control area; and an integrated record management/design change control database was being implemented. All backlog change incorporation was scheduled to be completed by December 31, 1992.

The inspectors also reviewed the licensee's actions with regard to the adequacy of vendor documents. This also was a previous SALP area. The stated objective of this item was to consolidate hard copy vendor documents into technical manuals that group single or similar components, assemblies or systems which are cross-referenced by component number, and to provide an efficient and expeditious method of indexing and locating needed reference material. Work was initially scheduled to begin in September 1991 but has been delayed pending contractor selection. A bid specification had been issued. Estimated completion is December 31, 1993.

Conclusions:

The licensee had initiated a River Bend Action Plan which was observed by the inspectors to be a living document that was reviewed monthly by senior management. Engineering and technical support was one of 40 action items being pursued by the licensee for improving licensee performance. Drawing changes and vendor documents were two areas where the inspectors observed that enhancements are being implemented. Progress in the area of vendor document adequacy has been delayed pending contractor selection.

2.2.12 General Observations Related to Engineering

Engineering Staff Experience and Turnover Rate

The turnover rate in engineering has been low. The most significant turnover rate was in system engineering as discussed in paragraph 2.2.8 above.

Backlog

A review of data provided by the licensee indicated that incorporation of design document changes (drawing changes) appeared to be the most significant backlog. The trend had decreased from the approximately 6,800 outstanding changes in January 1991 to 5503 in January 1992. As discussed above in paragraph 2.2.10, the licensee is addressing this issue within their action plan. There were approximately 216 open modification requests as of January 1992, with 42 expected to start or finish in the next 60 days. In addition, there were 237 open document change only modification requests. There were 67 open prompt modification requests.

The inspectors noted that there were a number of vendor documents, such as General Electric service information letters, which had been open for greater than 2 years.

Overtime

Overtime was indicated to be minimal.

Outside Contractors

River Bend used a significant number (62-December 1991) of contract employees to supplement their engineering work force. There were also a number (19-December 1991) of Stone and Webster employees in the engineering work force. There was even a higher utilization of contract employees during the current outage. The contract employee's are trained and integrated into the River Bend Station organization. Control of the work output appears to be working well. The difference in contractor salary along with per diem and paid expenses was a point of concern expressed by Gulf States permanent engineering personnel.

Engineering Interface - Plant Operations

Design engineering was a daily participant in the daily plant meeting and the Monday maintenance meeting. Design engineering held daily staff and planning and scheduling meetings. System engineering participated in the plant operations review committee meetings. The director design engineering and the manager of engineering were members of the nuclear review board.

In discussions of engineering's review of condition reports, the inspectors found that "repair" and "use as is" condition reports could be dispositioned by other than design engineering (such as system engineers and maintenance engineers). Procedure RBNP-30 stated that, "all dispositions that are determined to be one-time deviations must be processed by the Maintenance Codes and Standards, RBS Engineering Departments under the Direction of the Manager - River Bend Engineering or Plant Staff Systems Engineering Departments." The licensee's QA Organization indicated that this process was under evaluation. The inspectors determined that additional inspection would be performed to review design controls applied to "repair" and/or "use as is" dispositions (Inspection Followup Item 458/9210-01).

3. EXIT INTERVIEW

The inspectors met with the personnel identified in paragraph 1 on March 13, 1992, to discuss the findings and conclusions reached during the inspections. The licensee personnel acknowledged the findings. The licensee did not identify as proprietary any of the materials provided to, or reviewed by, the inspectors during this inspection.