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U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

South Texas Project Electric Generating Station
Unit 1
Docket No. STN 50-498
Evaluation of STP Readiness to Proceed Above 50 Percent Power

Reference: 1) ST-HL-AE-2278 - Unit 1 Power Ascension Testing During October, 1987, dated June 25, 1987
2) ST-HL-AE-2546 - Readiness to Begin Ascent to Full Power: A Self Assessment, dated March 1, 1988

Since the issuance of the full power license in March, 1988 Houston Lighting & Power Company (HL&P) has been conducting testing of the South Texas Project, Unit 1 at power levels up to, and including 30 percent power. Based on a review of these activities HL&P has evaluated the adequacy of plant hardware and operating staff performance to determine the readiness of STP to continue its power ascension in excess of 50% of rated power as described in references 1 and 2. This evaluation included a review of the startup and testing record to assure that root causes of problems have been properly addressed, that the work load is under control and will not impact proper attention to further operation and that employees are demonstrating a high level of professionalism and are progressing up the experience curve. The evaluation and its results are described in the attachment to this letter. The results of the evaluation demonstrate that:

1. The facility has been operated, tested and maintained in an acceptable manner. Problems encountered in the operating, testing and maintenance of the plant are being handled adequately. Additional testing to assure reliability of the steam driven feed pumps is planned during ascension to full power.

2. STP performance in terms of the numbers of ESF actuations, reactor trips, Technical Specification violations and Licensee Event Reports is consistent with other recently licensed plants.

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3. Other indicators of STP readiness include:

(a) The Health Physics Program is in place and is being appropriately implemented.

(b) Plant chemistry with few exceptions is being maintained within specification.

(c) The security system and personnel are performing satisfactorily. Improvements committed to prior to fuel load are being implemented on schedule.

(d) Preliminary findings from the Plant Assessment phase of the annual INPO Operational Assessment identified areas for improvement, but identified no concerns which would prevent continuation of the power ascension program.

(e) The operating staff's performance during routine operations, testing and actual plant casulties was observed to be effective in that they were attentive, aware and responsive to abnormalities, practiced verbatium compliance and behaved in a highly professional manner.

Based on the results of this evaluation, HL&P has determined that STP can safely continue its power ascension test program at power levels in excess of 50 percent of rated power.

The recent failure of a turbine driven main feed pump due to overspeed during performance of the loss of offsite power test, has interrupted the power ascension test program. While the equipment itself is not an essential element in the protection of public health and safety, nevertheless, its failure must be viewed as a threat to:

Safety of plant operating personnel;
Reliable generation of electric power;
and Protection of the financial interest of the owners.

Accordingly, HL&P has deferred further power ascension testing until such time that it is satisfied that each turbine driven main feed pump required for operation has demonstrated reliable overspeed protection capability.

If you should have any questions on this matter, please contact Mr. J. N. Bailey at (512) 972-8663.

J. H. Goldberg

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Group Vice President, Nuclear

JNB/yd

INTRODUCTION

Houston Lighting & Power Company (HL&P) has evaluated the hardware and operating staff performance at Unit 1 of the South Texas Project (STP) and has determined that HL&P can safely continue its power ascension test program in excess of fifty percent of rated power.

The evaluation included a review of the startup and testing record from issuance of the full power license to the 30 percent plateau to assure that root causes of problems have been properly addressed, that the work is under control and will not impact proper attention to further operation and that employees are demonstrating a high level of professionalism and are progressing up the experience curve. In addition, based on STP experience through the 30 percent plateau and recent industry events, HL&P has reviewed the remainder of the power ascension program and determined that it has been appropriately planned and scheduled. The results of the evaluation demonstrate that:

1. The facility has been operated, tested and maintained in an acceptable manner. Problems encountered in the operating, testing and maintenance of the plant are being handled adequately.

2. STP performance in terms of the numbers of ESF actuations, reactor trips, Technical Specification violations and Licensee Event Reports is consistent with other recently licensed plants.

3. Other indicators of STP readiness include:

   (a) The Health Physics Program is in place and is being appropriately implemented.

   (b) Plant chemistry with few exceptions is being maintained within specification.

   (c) The security system and personnel are performing satisfactorily. Improvements committed to prior to fuel load are being implemented on schedule.

   (d) Preliminary findings from the Plant Assessment phase of the annual INPO Operational Assessment identified areas for improvement, but identified no concerns which would prevent continuation of the power ascension program.

(e) The operating staff's performance during routine operations, testing and actual plant casulties was observed to be effective in that they were attentive, aware and responsive to abnormalities, practiced verbatium compliance and behaved in a highly professional manner.

The evaluation utilized a combination of performance indicators (e.g., numbers of reactor trips and ESF actuations) and observations by management/ supervision and third parties.

The evaluation was conducted in the following manner:

Six areas were selected based on their direct relationship to the safety of power operations:

1. Plant Operations
2. Maintenance/Work Control
3. Licensing
4. Testing
   a) Startup
   b) Surveillance
5. Radiation Protection and Chemistry
6. Security

The Department Managers responsible for the above functional areas were then asked to identify performance objectives in their respective areas. These were reviewed and approved by the Plant Manager and subsequently reviewed and approved by the Nuclear Safety Review Board (NSRB).

Each Manager then identified criteria to be utilized in the evaluation of each performance objective. These criteria were also reviewed and approved by the Plant Manager.

Evaluations were performed by review of data regarding STP performance since issuance of the Full-Power Operating License and in-plant observations. These evaluations utilized the criteria described above. The in-plant observations, again utilizing the above criteria, were performed in late April 1988, while the plant was operating at 30% power for testing. Observations were performed by management and supervisory personnel from each of the departments

under evaluation. In addition, the Shift Advisors, who are contracted to HL&P to advise the Shift Supervisors, performed the majority of the Operations Department in-plant evaluations.

To insert independence into the evaluation, the staff of the Independent Safety Engineering Group participated in evaluations, performed certain independent evaluations and participated in the development of the overall evaluation. The evaluation report has also been reviewed and approved by the NSRB.

The evaluation of each performance objective is summarized in the following attachment and described in detail in the following appendices. The summary brings forward those conclusions in the Appendices which are most pertinent to the evaluation. Action items resulting from these evaluations are being tracked to ensure appropriate response to identified items.

Some of the evaluations and conclusions reached in the summary include events which did not occur during the observation period, and are therefore not addressed in the Appendices.

SUMMARY OF PLANT OPERATIONS

Purpose:

To evaluate the performance of the operators during power operation and assess whether Plant Operations is meeting the following performance objectives:

- Operations procedures and documents provide appropriate direction and are effectively used to support the safe operation and testing of STP.
- Operations personnel work together as a team effectively, maintain awareness of plant status, report deficiencies and maintain safe and reliable control of plant operations, and testing.
- Operations personnel are cognizant of the status of plant systems and equipment under their control and ensure that systems and equipment are controlled in a manner that supports safe and reliable operation.

Method of Evaluation:

The evaluation was performed by the Shift Advisers and Operations Department Management observing Control Room and in-plant operators while the plant was operating at 30% power in late April 1988. They utilized the specific criteria contained in Appendix A to evaluate each performance objective. They also reviewed Control Room records (i.e., logs, valve lineup checks and Field Change Requests). Historical records from the time of initial criticality were reviewed to determine trends and areas requiring further review. Finally, they analyzed significant events that occurred since the full power license was issued to assess readiness to continue power ascension above the 50% level.

Summary of Evaluation:

The evaluation found that operations are performed in a manner adequate to support power ascension testing above 50% of full power. The evaluation areas found good practices as well as areas needing further attention. The evaluation of each performance objective is summarized below. Appendix A describes the specific details of the evaluation.

Performance Objective - No. 1. Procedural Compliance

Operations procedures and documents provide appropriate direction and are effectively used to support the safe operation and testing of STP.

Summary of Findings:

Compliance with procedures was found to be adequate. Personnel performing tasks where the procedure was required to be "in-hand" were in possession of the appropriate procedures and utilized them. Procedures requiring Field Changes were temporarily changed within the procedural requirements. Testing was completed using approved procedures. Pretest briefings were conducted

effectively. Major plant evolutions were appropriately discussed by the plant staff and the test coordinators prior to the start of the evolution and evaluated as the evolution progressed. Procedures, in general, were found to contain adequate information and direction for the operators.

Field Change Requests were not being incorporated into procedures in a timely manner. As a result, unnecessary time demands were being placed on the Shift Supervisor in order for him to review and approve routine work. This was judged to be the most significant area requiring improvement.

An evaluation to determine the schedule for the revision of station procedures to incorporate existing FCRs will be completed by July 15, 1988. Procedure revisions are expected to be completed by October 15, 1988.

Specific instances were identified where additional ladders and platforming would facilitate convenient access to hard to reach components. As a result, a study to evaluate the need for additional ladders and platforming will be done by July 31, 1988.

Performance Objective - No. 2. Conduct of Operations

> Operations personnel are able to work together as a team effectively, maintain awareness of plant status, report deficiencies and maintain safe and reliable control of plant operations and testing.

Summary of Findings:

Good teamwork and communications were evident, particularly during testing. Operator response to abnormalities, plant transients and annunciators was adequate. Regulatory reporting requirements were met in a timely manner. The Operators have demonstrated adequate control over plant status during normal operations and the power ascension program.

Shift Advisors were placed on shift in February. These advisors were seasoned veterans selected from throughout the industry. They were provided to advise the Shift Supervisor on how best to spend his time and energies among his various duties and provide eyes that had seen and experienced events which occur during testing and power ascension. With the Shift Advisors' help, the Shift Supervisors and Operators have matured rapidly and have developed a sense of responsibility and confidence in their ability to operate the plant safely. Because the Shift Advisors have successfully accomplished their mission, HL&P has reduced their participation to approximately 12 hours a day during the week and approximately eight hours each weekend day in the Control Room. HL&P plans to terminate their role during the 50% power plateau. Thereafter, HL&P plans to continue to maintain a frequent HL&P management presence in the Control Room.

The most significant area found to require improvement was the process for gathering and disseminating STP plant operating experience among shifts. To improve such communication the Unit Operations Manager met with shift personnel and reviewed with them the importance of including more details in logs and turnover briefings on plant response to transients.

During the evaluation period, there was an event in which a Shift Supervisor made a voluntary entry into Technical Specification 3.0.3 during increased

surveillance testing of the steam generator power operated relief valves. This was reported to the NRC on LER 88-29 and was discussed at the enforcement conference held May 26, 1988 with NRC Region IV. The root cause of the event was determined to be a failure by Management to adequately dissemenate appropriate policy direction. Corrective actions included night orders to prevent recurrence during the investigation period, and thereafter the Plant Manager met with Unit 1 Shift Supervisors to discuss the event and ensure proper understanding on the entry into paragraph 3.0.3. In addition, a procedure was revised to reflect appropriate actions and reporting requirements.

Another area identified as requiring improvement was that the Control Room Operators should make better use of the trend recorders located on back panels in the Control Room. The Operators have been instructed by Operations Management to use all available instrumentation in understanding plant status including the back panel recorders.

A strong point in the Operations program is the Operators Code of Professionalism which has been developed by the Operators themselves using the INPO guidance and is in use at this time.

Performance Objective - No. 3. Plant Configuration Control

> Operations personnel are cognizant of the status of plant systems and equipment under their control and ensure that systems and equipment are controlled in a manner that supports safe and reliable operation.

Summary of Findings:

Control of plant equipment configuration was found to be acceptable. Equipment Clearances were effectively controlled, locked valves were in their proper position, Temporary Modifications were controlled with tags and Technical Specification Limiting Conditions for Operation were identified and tracked effectively.

This area was specifically selected for review because of two events which occurred prior to criticality. These two events, both involving valve misalignment, were reported as LERs nos. 87-012 (HHSI valves), and 88-016 (Feedwater Flow Transmitter Isolation Valves). Additionally, misapplication of the Technical Specifications led to reportable events. As a result of these events, improvements as noted in the LERs, were made to strengthen operator cognizance and control of plant configuration. Trends in LERs related to misalignment indicate the improvements have been effective.

During the evaluation, other areas requiring improvement were identified. The most significant is the control of annunciators that are out of service or in the alarmed condition. The operating conditions are being effectively monitored and appropriate actions taken. However, correction of associated deficiencies is not timely, as there were more annunciators in alarm than desirable. As a result of this concern, a task force has been formed to evaluate the number of annunciators in alarm during power operations, consider the need for improvement of annunciator prioritization and establish a priority for correcting known

annunciator deficiencies. Annunciators which are routinely in alarm during Mode 5 operation have been identified and are being worked off after being categorized and prioritized. Investigation of the highest priority nuisance alarm group is in progress with tentative solutions identified for several groups. The review is expected to be on goinz through 1988 with resolutions implemented on a priority basis between now and first refueling. The task force will remain in place until plant management has determined that the corrective actions have effected a long term solution to this concern.

Other areas identified as requiring improvement, as determined during the evaluation, included:

1) Although Equipment Clearances were judged to be adequately controlled, other events relating to Equipment Clearance and tagging have occurred. One event involved opening a valve that had not been placed on the Clearance Order but was within the tagged boundaries. As a result, subsequent system restoration failed to close the valve and an oil discharge to the building floor occurred. In another tagging event a steam valve on a main feedwater pump was closed for maintenance, but the valve was not tagged in that condition. The final event involved tagging out the wrong ventilation fan for performance of a PM. While none of these events degraded nuclear safety or resulted in personnel hazard, HL&P is placing increased emphasis and management effort on requiring attention to detail in all aspects of implementation of the clearance procedures. Included in these efforts is an evaluaton of the need for a procedural requirement for an independent verification of the adequacy of the tagged boundaries.

2) Annunciator response procedures used by the operators generally provide adequate information for prompt response. However, they require review to increase assurrance that the guidance provided is complete. This work is planned for completion by December 31, 1988.

3) Coordination of work scheduling activities among the disciplines (electrical, mechanical, and instrument and control) should be improved to minimize the number of times safety equipment is removed from service. The Work Control Center, is now preparing integrated schedules and conducting interdisciplinary meetings to improve coordination.

SUMMARY OF MAINTENANCE/WORK CONTROL

Purpose:

To evaluate the performance of the Maintenance Department, its personnel and programs and assess whether Maintenance/Work Control is meeting the following performance objectives:

- The material condition of the plant is known and maintained to support safe and reliable plant operation.
- The control of maintenance work supports the completion of tasks in a safe, timely, and efficient manner such that safe and reliable plant operation is optimized.
- Maintenance is conducted in a safe and efficient manner to support plant operation.
- Preventive Maintenance (PM) contributes to optimum performance and reliability of plant systems and equipment.
- Maintenance history is used to support maintenance activities, upgrade maintenance programs, optimize equipment performance, and improve equipment reliability.
- Materials management ensures that necessary parts and materials meeting quality and/or design requirements are available when needed.
- Maintenance personnel knowledge and performance supports safe and reliable plant operation.

Method: Maintenance Managers and supervisory personnel from each craft observed maintenance activities during plant operations at 30% power during late April. They utilized checklists to perform evaluations on criteria which support the performance objectives listed above. Reviews also were performed on procedures, documentation of maintenance activities druing the evaluation period, as well as trending of historical performance.

Summary of the Evaluation

Overall, each of the performance objectives has been met and power ascension testing may proceed at power levels in excess of 50 percent of rated power. The evaluation revealed good practices as well as areas requiring further attention and improvement. Appendix B describes the specific details of the evaluation. The evaluation of each performance objective is summarized below:

Performance Objective - No. 1 Material Condition

The material condition of the plant is known and maintained to support safe and reliable plant operation.

Summary of Findings:

The backlog of Maintenance Work Requests on the Main Control Boards was considered excessive and was trending upwards. A task force was assigned to determine appropriate actions to improve this situation. Further descriptions of the corrective actions is given in the operations section. In other respects, the maintenance of the plant and its material condition were judged to be acceptable. Activities associated with main feed pump reliability are discussed in Appendix D, Testing.

Fluid system leaks were carefully evaluated to determine if they were being minimized to the extent practical. The program to identify and repair leaks was determined to be adequate.

Performance Objective - No. 2 Control of Maintenance Work

> The control of maintenance work supports the completion of tasks in a safe, timely, and efficient manner such that safe and reliable plant operation is optimized.

Summary of Findings:

At the start of the evaluation period, the coordination between the various organizations required improvement. The priority assigned to work items and the schedules issued to the craft personnel were not always in concert with WCC schedules and direction. During the evaluation period, Management has taken steps to improve the work control process and as of the end of this evaluation period, the performance objective is being met.

Instances occurred during the evaluation period which involved actions associated with maintenance activities that caused effects not expected in the Control Room. These occurred because the Reactor Operators were not fully apprised of the scope and actions resulting from the work. Immediate management action was taken to correct this interface deficiency and long term programatic changes are being developed.

Performance Objective - No. 3 Conduct of Maintenance

> Maintenance is conducted in a safe and efficient manner to support plant operation.

Summary of Findings:

The performance objective was satisfactorily met. The Maintenance personnel exhibited professionalism and competence in performing assigned tasks. Personnel were attentive to the need to identify plant deficiencies. The maintenance was properly authorized, controlled, and documented. Work was performed in accordance with controlled documents. Good work practices were demonstrated, proper tools and equipment were used. System and work-site cleanliness were maintained. Appropriate post maintenance testing was performed.

One significant item involved delays in the starting of maintenance work during

shift turnover which results in some inefficient maintenance activities. This item detracts from good manpower utilization, but is not a constraint on operation above 50% power.

Performance Objective - No. 4 Preventive Maintenance

> Preventive Maintenance contributes to optimum performance and reliability of plant systems and equipment.

Summary of Findings:

The performance objective was satisfactorily met. Preventive Maintenance planning shows that maintenance is performed at appropriate intervals. The Preventive Maintenance activities and frequencies are based upon recommendations listed in associated vendor manuals, industry experience, and engineering recommendations. The frequency is based upon environmental qualification requirements when applicable. Preventive Maintenance is being deferred only with proper management approval. Preventive Maintenance activities are performed at appropriate intervals.

The ratio of Preventive Maintenance to corrective maintenance activities presently is approximately 30 percent. At this stage of plant life, this is judged to be appropriate.

At the present time, a large percentage of PMs are currently being deferred because of the amount of corrective maintenance that is being performed due to the startup and power ascension test program. Actions being taken include: first, a task force to evaluate and reschedule the PMs; second, the I&C area is spending additional resources to lessen its backlog; third, an assessment of the Preventive Maintenance Program will be performed to assure its effectiveness.

Performance Objective - No. 5 Maintenance History

> Maintenance history is used to support maintenance activities, upgrade maintenance programs, optimize equipment performance, and improve equipment reliability.

Summary of Findings:

Although the maintenance history is not being maintained at a completely satisfactory level, the performance objective was adequately met. When corrective maintenance activities are completed, a summary of work performed is being entered into history for future use. The program currently lacks sufficient guidelines to establish the information base to determine broad base trending analysis. Industry wide information through NPRDS is available, however, some of the potential users are unfamiliar with program capabilities and benefits. The program as currently configured is adequate to support operation at power levels in excess of 50% power. Additional actions to improve the data base and establish goals and schedules to meet the performance objective will be complete by August 17, 1988.

Performance Objective - No. 6 Materials Management

Materials management ensures that necessary parts and materials meeting quality and/or design requirements are available when needed.

Summary of Findings:

The performance objective is being met. Although this area has previously been identified as a weak area, spare parts and material are being procured and stocked to support the necessary work activities. Improvements are being made in the availability of materials. The evaluation of specific job activities demonstrated that material, although not always readily available, was obtained in an acceptable time frame.

One significant item was identified. The crafts were found to spend an excessive amount of time determining availability of material and then staging it to support work. Although material was available, the efficiency of Maintenance crews was reduced. Although such use of this time is inefficient, it is judged not to constrain operation at power levels in excess of 50 percent of rated power. Action has begun to further evaluate the identified problems and recommend corrective actions. This action is expected to be complete by July 1, 1988.

Performance Objective - No. 7 Maintenance Personnel Knowledge and Performance

Maintenance personnel knowledge and performance supports safe and reliable plant operation.

Summary of Findings:

The performance objective was satisfactorily met. Maintenance was found to be performed by or under the direct supervision of qualified personnel. Maintenance personnel knowledge was evident by their demonstrated abilities in performing their tasks. An area where improvement is needed is craft knowledge about plant system operation and interactions. Elements of an appropriate training plan will be available in July, 1988.

SUMMARY OF LICENSING

Purpose:

To evaluate significant indicators of plant performance and compare those of STP to other operating units and to perform special evaluations of significant issues and assess whether the plant is meeting the following performance objectives.

Method: This evaluation was performed by reviewing existing plant documentation.

Summary of Evaluation:

The performance of STP was found to be consistant with that of other plant in the same period of operation. Evaluations of specific problem areas showed that the problems were dealt with and solved promptly. Therefore, there is no constraint to continue with testing in excess of 50% of rated power. Details of the evaluation are in Appendix C. An evaluation of each of the performance criteria follows:

Performance Objective - No. 1 Comparison to Other Plants

A comparison will be made of the number of unplanned ESF actuations, unplanned reactor trips, Technical Specification violations, and number of LER's from initial criticality to initiation of 50% power testing between STPEGS and other recent first unit Westinghouse plants (i.e., Vogtle, Byron 1, Calloway and Wolf Creek).

A summary of the results of the comparisons made in the above areas will be provided. A ranking against the 19 NTOL plants in accordance with AEOD criteria will be provided for the period from issuance of the low power license until completion of 50% power testing.

STPEGS will be evaluated against the performance indicators tracked in NUREG 1275.

Summary of Findings:

A comparison was made between STP and other recently licensed plants and evaluated by two methods. First a comparison with other utilities having recent first unit Westinghouse plants using the data from NUREG 1275 was performed. The areas evaluated were:

ESF Actuations,
Reactor Trips,
Technical Specification Violations,
License Event Reports.

STP was above average when considering the data on an event per month basis in the period between initial criticality and Commercial Operation.

Second, an evaluation was performed using the systematic review of the operating experience data bases with the statistical methods of AEOD/P604 dated August 21,

1986. In this case STP was ranked against the 19 plants evaluated by AEOD/P604 in the following areas:

Reactor Protective System Actuations (9 of 20)
(<15% and >15% power) (6 of 16 and 1 of 20)
ESF Actuations (9 of 20)
Security Events (14 of 20)
Miscellaneous Events (12 of 20)

HL&P therefore concludes that while continuing improvement in performance is necessary, performance to date is consistent with other units and is considered to be a positive indicator to continue power ascension testing above 50% rated power.

Performance Objective - No. 2 Station Problem Reports

A status report on the progress with the SPR program will be provided. Details on the number of overdue actions and the total number outstanding SPRs will be discussed. Any significant SPRs which were identified or resolved between initial criticality and completion of 50% power testing will be described.

Summary of Findings:

The evaluation of the handling of problem reports shows continuing satisfactory performance in this area during the period of evaluation.

Performance Objective - No. 3 Root Cause Evaluation

A review of SPRs for repeat events which would be indicative of the quality of the root cause evaluation will be conducted. The results of this evaluation and the status of root cause training will be described.

Summary of Findings:

Root cause determination continues to be stressed by management in the evaluation of problems. However in some instances recurrence control has not been completely effective. Additional training and management attention has been given to strengthen the organization and improve performance. As of this date over 100 personnel have received this training.

Performance Objective - No. 4 Justification for Continued Operations

A description of significant conditions which occurred between initial criticality and completion of 50% power testing that required development of a justification for continued operation will be provided. Any lessons learned will be described.

Summary of Findings:

The evaluation showed that safety evaluations used to justify continued operation need to be more timely and complete.

Four significant material problems have occurred in which safety evaluations were performed to justify continued operations. These were, the through wall seepage in Essential Cooling Water System fittings, the use of the wrong seal material in steam generator power operated relief valves (PORVs), the vibrational wear of Bottom Mounted Instrumentation thimble tubes, and an inappropriate material used in auxiliary feed pump shaft sleeves.

There were several areas requiring improvement in the development of safety evaluations. The initial evaluation of ECW lacked detail, but was satisfactory following additional work. The PORV evaluation was timely but incomplete in that the equipment qualification evaluation was not adequately addressed. Several actions, however, are being taken to strengthen our capability in this area.

Engineers experienced in application of both design and licensing criteria will be assigned to monitor the development of future safety evaluations. It is expected that their efforts will result in a general upgrading of the quality, uniformity and completeness of those safety evaluations completed in support of justifications for continued operation as well as safety evaluations performed in support of proposed plant modifications.

Performance Objective - No. 5 Commitment Tracking System Adequacy

> A description will be provided of lessons learned from several missed NRC commitments and our enhanced management emphasis on commitments will be discussed.

Summary of Findings:

The system was found, in general, to be satisfactory but improvements were needed and subsequently made in the verification process associated with regulatory response letters prior to sign out.

SUMMARY OF TESTING

Purpose:

To evaluate the areas of Initial Startup Testing and Surveillance Testing and assess whether the testing of the plant is meeting the following performance objectives:

- Administrative programs are effective in implementing the Surveillance and Initial Startup Test Program.
- Procedures are complete and adequate to ensure proper performance and compliance with regulations.
- Test performance practices comply with safety requirements, and satisfy procedural and documentation requirements.
- Personnel are adequately trained/experienced to ensure safe and proper procedure implementation.

Method: Testing management, supervisory personnel and Engineering participated in observations of startup and surveillance testing. Documentation associated with the testing was also reviewed as well as historical data such as test results and LERs.

Summary of Evaluation

Overall, each of the criteria has been met and power ascension greater than 50% may proceed. The evaluation revealed good practices and areas requiring improvement. Appendix D describes the specific details of the evaluation. The evaluation of each performance objective is summarized below:

Performance Objective - No. 1 Administrative Programs

Administrative programs are effective in implementing the Surveillance and Initial Startup Test Programs.

Summary of Findings:

The administrative programs are effective in implementing the Surveillance and Initial Startup Test Programs.

In the plant testing area however, several plant material problems have occurred. Each has been dealt with on a technical basis by Engineering, root cause established and found not to constrain operation in excess of 50% power. These issues include:

- Essential Cooling Water Piping and Fittings;
- Auxiliary Feedwater Pump shaft sleeve failures;
- Bottom Mounted Instrumentation thimble wear;
- Use of improper seal material in Steam Generator Power Operated Relief Valves hydraulic system;
- Main feed pump reliability including the overspeed event;

The main feed pump reliability is being established through a number of special tests and repairs. Continued special tescing will occur during the power ascension program.

In the surveillance area, several significant events occurred.

Five missed surveillances occurred in the evaluation period. Three have been attributed to improper scheduling methods. These three involved test results which required the test frequency to be doubled. The programatic methods for handling surveillance tests which require increased surveillance have been changed to provide additional procedural guidance for making the scheduling change. The fourth, a test package which satified several surveillance requirements, was completed approximately eight hours after the required frequency completion date and time. The root cause of this event was that several tests were contained within a single test procedure and it was not readily apparent what the most restrictive due date was. Individual test procedures are now being prepared in separate test packages so that required completion dates are readily apparent. The fifth incidence of a missed surveillance test occured recently prior to entering Mode 2. Corrective actions for this event are still being developed and will be reported in LER 88-034 when submitted.

The frequency and type of missed surveillances demonstrates a need for increased management involvement to improve performance. A task force, reporting to the Unit 2 Plant Superintendent, is recommending further actions. Their recommendations are due in July, 1988.

Performance Objective - No. 2

> Procedures are complete and adequate to ensure proper performance and compliance with regulations.

Summary of Findings:

The evaluation determined that the performance objective is being met. Startup test procedures and surveillance procedures are properly documented and prompt, adequate reviews of results are being done.

One problem concerned a calculational error discovered by an NRC inspector on an Initial Startup Test data sheet. A review of calculations associated with the low power test sequence was conducted and one additional calculation error was found. A subsequent review of calculations performed through the cold precritical test sequence found two more calculational errors. Based on further evaluations, it is believed that these errors are not a generic problem. None of the calculation errors impacted the test results. Improvements to the program were made which included a clarification of the independent review requirements and training in that same area.

Performance Objective - No. 3

> Test performance practices comply with safety requirements, and satisfy procedural and documentation requirements.

Summary of Findings:

The evaluation found that coordination between departments is smooth and effective during surveillance tests and verbatim compliance is achieved. Documentation is complete and adequate post-test reviews are conducted.

Performance Objective - No. 4

Personnel are adequately trained/experienced to ensure safe and proper procedure implementation.

Summary of Findings:

Personnel appear to be adequately trained and able to implement the procedures. On one occasion it was observed that the performer went back to the writer of the procedures to ensure full understanding of method and intent.

SUMMARY OF HEALTH PHYSICS - CHEMISTRY

Purp.

To [illegible]he performance of the plant staff in the areas of Health Ph[illegible]emistry and assess whether the Health Physics and Chemistry Dep[illegible]e meeting the following specific performance objectives:

[illegible] Physics program ensures that plant areas and worker activities are controlled in accordance with applicable standards.

- o Procedures and equipment are in place to ensure that Technical Specification and plant chemistry parameters can be analyzed and out of specification conditions identified.

- o Chemistry parameters are controlled within specification and out of specification conditions are corrected promptly. The radioactive waste system is ready to support plant operations.

Summary of Evaluation:

The Radiation Health Program, and the control of chemistry by the plant staff are ready to support testing at power levels in excess of 50%. Appendix E describes the specific details of the evaluation.

Method: The evaluations were performed by the Health Physics Supervisor while the plant was operating at 30% power in late April, 1988.

The methods of evaluation for all performance criteria included review of documentation generated during observations (i.e., logs, trend graphs, etc.); observation of watchstanders performance; walk through of plant areas as well as evaluation of historical records.

Performance Objective -1. Health Physics

The Health Physics Program ensures that plant areas and worker activities are controlled in accordance with applicable standards.

Summary of Findings:

The Health Physics program at STP is established and ready to fulfill its function. At the present time, however radiological conditions at STP are relatively benign, and the program is largely untried. Programs are in place to ensure that there are sufficient radiological controls to meet requirements found in 10CFR20, Technical Specifications and other plant requirements. These programs will be further evaluated as radiological conditions become more demanding to ensure that they are followed and that they meet their intended function.

Performance Objective - 2. Chemistry Analysis

Procedures and equipment are in place to ensure that Technical Specification and plant chemistry parameters can be analyzed and out of specification conditions identified.

Summary of Findings:

System performance to date indicates that with a few exceptions, plant systems are operating within Technical Specifications and plant chemistry limits. Those chemistry parameters not in specification at the time of submitting this evaluation are condensate system dissolved oxygen and conductivity and RMWST dissolved oxygen. In addition, while not exceeding any specification, levels of sodium detected in the primary system are higher than expected. Resolutions to these problems are being pursued. No long-term adverse consequences are expected.

Performance Objective - 3. Chemistry Operations

> Plant chemistry parameters controlled by the Chemistry Operations group are maintained in specification and any out of specification conditions are corrected in a timely manner. The radioactive waste system is ready to support the processing of radioactive waste produced by plant operations.

Summary of Findings:

Plant chemistry is being maintained adequately within specification with prompt corrective action taken for out of specification conditions. An area requiring improvement is repair of on-line chemistry analysis instrumentation. While the systems will support continued plant operation repair of these systems will reduce the level of compensatory measures that must be taken. The nonradioactive waste basin and oily waste system also require repair.

The liquid radioactive waste system in the plant has been tested and is ready to support plant operations. Procedures are in place and necessary equipment is operable to process radioactive waste and to ship it off-site for disposal.

Two instances of improper discharge of liquid waste occurred recently. One case involved a tank that was properly sampled; however, the release was nondeliberate in that the operator discharged the wrong tank. The second release reported on LER 88-036 was unmonitored when an operator discharged the wrong tank. These two events occurred within five days of one another and as a result of these events, the procedures controlling final discharge of tanks have been revised to require independent verifications of valve line-ups prior to discharge of waste. Other corrective actions, as necessary, will be reported in the LER.

SUMMARY OF SECURITY

Purpose:

To assess the performance of the STP security system performance, by evaluation of the following performance objectives.

- The Intrusion Detection System is adequate and in compliance with regulatory requirements.
- The Training Qualification Program provides a trained security guard force meeting regulatory requirements.
- The design basis threat will be adequately met in accordance with regulatory requirements.
- The Security Force will be adequately staffed to satisfy program requirements.
- Security procedures provide appropriate direction and plant personnel are aware of their responsibilities to support zero reportable or loggable access control events.
- Provide for program enhancement through self evaluation.

Methods: Evalutions were performed by Security Management and supervisory personnel by observing activities of the guard force including drills while STP was at 30% power in late April, 1988. Reviews of documentation, including IDS performance and reportable events, was also performed.

Summary of Evaluation:

Nuclear Security is effectively meeting the performance criteria. Personnel are well trained, available in adequate numbers and performing well on duty. Improvements to the physical security system are ongoing and system performance continues to improve. Therefore, there is no constraint to continue testing in excess of 50% of rated power.

Appendix F describes the specific details of the evaluation. The evaluation of each performance objective is summarized below.

Performance Objective - No. 1. Intrusion Detection System (IDS)

The Intrusion Detection System (IDS) is adequate and in compliance with regulatory requirements.

Summary of Findings:

The Intrusion Detection System has had a number of significant changes, and studies are underway to determine the need for additional changes. The E-field

system has been redesigned and microwaves have been added to strengthen some areas. Commitments to date have been fulfilled prior to the deadlines. The IDS will continue to be assessed and improvements made, as appropriate, during the year following issuance of the full power license. The Closed Circuit Television (CCTV) system has been upgraded, allowing a reduction in certain compensatory measures.

Performance Objective - No. 2. Training Program

The Training and Qualification Program provides a trained security guard force meeting regulatory requirements.

Summary of Findings:

The Training Program underwent an intensive and extensive review based upon the Systematic Approach to Training concept, under the auspices of the Nuclear Training Department. All commitments to date have been met (e.g., new and retrofit classes completed). The remaining commitment (i.e., alarm station training) is on schedule. A new drill program was initiated and drills are regularly reviewed.

Performance Objective - No. 3. Design Basis Threat

The design basis threat will be adequately met in accordance with regulatory requirements.

Summary of Findings:

Security Force response to and evaluation of alarms is well within the parameters established by our procedures. Officer postings during security system failures are timely and appropriate. Based upon plan and procedural context, and experience to date, we believe that the design basis threat can be adequately met.

Performance Objective - No. 4. Security Force Staffing

The Security Force will be adequately staffed to satisfy program requirements.

Summary of Findings:

A lower than expected attrition rate has permitted the Security Force to approach total force size more quickly than expected. This has allowed a change in the work schedule which has provided the officers with more regular work hours and days off, thereby enhancing officer readiness and morale.

Performance Objective - No. 5. Access Control

Security procedures provide appropriate direction and plant personnel are aware of their responsibilities to support zero reportable or loggable access control events.

Summary of Findings:

Access Control performance has not yet met our expectations. We will continue to apply increased attention, as appropriate, in the badging area, in order to reduce the frequency of badging events. Instances of improper vehicle access control and personnel "tailgating" through controlled doors are bei g adequately controlled.

Perormance Objective - No. 6. Self Assessment

Provide for program enhancement through se.f evaluation.

Summary of Findings:

Nuclear Security initiated a self assessment program in January, 1988. Seven assessments have been performed thus far and valuable items for improvement have been identified and scheduled for action or completion.

EVALUATION OF PLANT OPERATIONS

APPENDIX A

FOREWORD

This Appendix contains the observations of the Shift Advisors and Operations management personnel during in-plant observations of Operations activities. Since the Shift Advisors are contract personnel on temporary assignment to STP, and are not completely familiar with STP programs, some of their recommendations were premised on incomplete information. Nevertheless, their recommendations are included in this Appendix.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
1. PROCEDURAL COMPLIANCE

CRITERIA

1.A Improving trend in number of FCRs generated between:

a) Operating License issue to initial criticality, and

b) Initial criticality to 50% power.

ASSESSMENT

OBSERVATION

A comparison of the FCRs generated between Operating License issue and initial criticality with those generated after initial criticality does not provide a clear indication of improvement. This is not unexpected as a large number of procedures were used for the first time when the plant entered mode 1 and secondary equipment was placed in service.

RECOMMENDATION (1.1)

Ensure FCR's are integrated into procedures in a prompt manner or are promptly eliminated if determined inappropriate.

SUMMARY

The existing trend is considered acceptable based on this time in plant life.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
1. PROCEDURAL COMPLIANCE

CRITERIA

1.B.a) Operational and testing activities are conducted in accordance with approved procedures.

ASSESSMENT

1. OBSERVATION

During the period of observation, operational and testing activities were conducted in accordance with approved procedures. Operations personnel were motivated to use procedures to govern their activities. Major plant evolutions were discussed prior to the evolution and often the procedure was read aloud by the Unit Supervisor step-by-step while the operators performed the evolution.

RECOMMENDATION (1.2)

Continue the management practice of emphasizing the importance of procedural controls.

2. OBSERVATION

During this observation period the plant was operated in Modes 1, 2 and 3 to support various tests. Feedwater was shifted from auxiliary feedwater to start up feedwater, high nozzle injection to low nozzle injection. The deaerator was placed in at least three different modes of operation. Steam dump control was established and main steam line drains were placed in and out of service at least twice. Several surveillance tests were conducted during the observation. Some preliminary testing was attempted on two of the three main feedwater pumps. The testing was appropriately terminated to correct equipment deficiencies on the pumps.

Surveillance tests were guided by approved procedure. However, two of these procedures had errors that were encountered by the tester and the operators in the past. In one case procedure field changes were required to complete the ST. In the other case, discussion between the operator and the technicians was necessary to allow completion of the surveillance within the procedural guidance. Each of these increased testing time.

Observed formal testing was performed in accordance with approved test procedures. Pretest briefings were in general conducted effectively. Operators questions before and during testing were dealt with promptly, even if this delayed the test.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
1. PROCEDURAL COMPLIANCE

CRITERIA

1.B.a) Operational and testing activities are conducted in accordance with approved procedures. (Cont.)

RECOMMENDATION (1.3)

Appropriate management action is necessary to ensure the ST's found to require field changes for completion are modified to reflect those changes before the procedure is sent back into the plant for subsequent use.

SUMMARY

Generally surveillance test procedures are adequate, but time must be spent by responsible disciplines with the Shift Supervisor each time the test is performed because FCR's have not been promptly incorporated. This detracts from the time Shift Supervisors have available to monitor plant status.

3. OBSERVATION

OPGP03-ZA-0010, "Plant Procedure Compliance, Implementation, and Review", requires a procedure be present when performing certain types of activities. Observation of control room personnel found the operators in compliance with these requirements.

RECOMMENDATION

None

4. OBSERVATION

The INPO Good Practice on Shift Relief indicates (Step 6.10) a shift briefing be conducted by the Shift Supervisor or his assistant after shift turnover. OPGP03-ZA-0063, "Plant Operations Shift Turnover", step 3.2.2 states the Shift Supervisor should ensure that a shift briefing is held as required by OPGP03-ZA-0064, "NPOD Preshift Briefing". Also, step 4.8 in OPGP03-ZA-0063, states the Shift Supervisor or designee conduct a shift briefing and lists items to be discussed. The procedure does not specifically state if this is to be pre or post turnover briefing, however, its location in the procedure section on "Shift Relief Procedures" implies it is intended to be a post turnover briefing as indicated in the INPO Good Practice. No post turnover shift briefings are performed at present.

RECOMMENDATION (1.4)

Determine if the intent of OPGP03-ZA-0063 is being satisfied and make it clear in the procedure if step 4.8 is intended for preshift or post turnover briefing.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
1. PROCEDURAL COMPLIANCE

CRITERIA

1.B.a) Operational and testing activities are conducted in accordance with approved procedures. (Cont.)

SUMMARY

Currently, shift briefings are held before turnover.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
1. PROCEDURAL COMPLIANCE

CRITERIA

1.B.b) Personnel take appropriate action when procedures are found to be inadequate for the intended tasks or when unexpected results occur.

ASSESSMENTS

1. OBSERVATIONS

1. No procedural guidance could be found which directed the operators on action to take when procedures are found to be inadequate for the intended tasks or when unexpected results occur.

2. Observed actions consisted of one of the following:

a. Field changing the procedure.

b. Searching for another procedure which will obtain the desired results.

c. Re-configuring the plant to accomplish the desired end. (e.g., Shutdown the turbine generator to test governor valves when they failed to test during operation.)

3. None of the actions taken in the above cases were inappropriate, but on several occasions there was doubt about how to approach the situation.

2. RECOMMENDATION (1.5)

Revise OPGP03-ZA-0010 to include a policy which provides guidance on actions to take when procedures are found to be inadequate or produce unexpected results.

3. SUMMARY

Personnel observed took appropriate action when procedures were inadequate or produced unexpected results.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
1. PROCEDURAL COMPLIANCE

CRITERIA

1.B.c) Procedures are readily available and clearly identified.

ASSESSMENTS

1. OBSERVATION

A set of plant procedures is available to the operators in the control room. Additionally, controlled working copies of Operating procedures and Surveillance Procedures are maintained in control room files.

The procedures are segmented into functional sets and placed in convenient places in the control room. For instance, the Emergency Operating Procedures are maintained in special binders on a rolling cart convenient for use in an emergency.

The procedures are clearly identified by the plant numbering system, but a working knowledge of this system is necessary to find a specific procedure. No master index is available in the control room, although a partial index is kept by the Unit Supervisor.

2. RECOMMENDATION (1.6)

Provide a master index of procedures in the Control Room. This index should retain existing procedure numbers and titles but group system procedures by classification i.e., electrical, primary, secondary, fire protection, lube oil, gas, etc.

3. SUMMARY

Procedures are readily available but are difficult to locate because of their random distribution based on the current index.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
1. PROCEDURAL COMPLIANCE

CRITERIA

1.C.a) FCR's are appropriately reviewed and authorized prior to use.

ASSESSMENT

1. OBSERVATION

OPGP03-ZA-0002, "Plant Procedures", provides administrative controls for making temporary changes (FCRs) to plant procedures. Observation of control room activities related to temporary changes to procedures found the operators in compliance with these administrative controls.

RECOMMENDATION (1.7)

None

SUMMARY

Observed use of FCR's was appropriate.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
1. PROCEDURAL COMPLIANCE

CRITERIA

1.C.b) Users are aware of applicable temporary changes.

ASSESSMENT

1. OBSERVATION

Observation of control room activities found the operators review FCRs to procedures prior to use to ensure they are valid.

RECOMMENDATION

None

SUMMARY

FCR's are used correctly and effectively.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
1. PROCEDURAL COMPLIANCE

CRITERIA

1.C.c) FCR's are cancelled in a timely manner or incorporated into permanent procedures.

ASSESSMENT

1. OBSERVATIONS

Random sample of plant operations procedures were reviewed. Thirty-seven (37) FCRs were identified associated with 18 procedures. The following is a breakdown on the length of time these FCRs have been outstanding against these procedures:

Days Outstanding	Number
≤15	4
≤30	8
≤45	2
≤60	4
≤75	6
≤90	7
≥90	6

Of the 6 FCRs that are greater than 90 days old, 2 are against system operating procedures, 2 against fuel handling procedures and 2 against off-normal operating procedures. Only 2 of the procedures selected had more than 3 FCRs outstanding against them. These two procedures are general operating procedures. A check indicated these two procedures are in the revision process at the present time.

2. RECOMMENDATION (1.8)

Initiate revisions to those procedures with FCRs outstanding for more than 90 days. Establish a policy on initiating procedure revisions based upon length of time FCRs are outstanding.

3. SUMMARY

Cancellation or incorporation of FCR's is not timely. Corrective action, within existing administrative guidelines, should be initiated.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
1. PROCEDURAL COMPLIANCE

FCR SURVEY
4-22-88

FCR	PROCEDURE	PREPARED DATE
88-0711	0POP02-ZA-0006	4-18-88
88-0664	1POP02-CD-0001	4-06-88
88-0694	1POP02-EW-0001	4-12-88
88-0526	1POP02-FC-0001	3-16-88
88-0510	0POP02-FO-0001	3-14-88
88-0350	0POP02-FO-0001	2-20-88
88-0411	0POP02-LM-0002	2-26-88
88-0278	0POP02-LM-0002	2-10-88
88-0615	1POP02-LT-0001	3-28-88
88-0028	1POP02-LT-0001	1-10-88
87-2324	0POP02-LW-0001	9-13-87
88-0174	1POP02-MS-0001	2-01-88
88-0573	1POP03-ZG-0001	3-24-88
88-0381	1POP03-ZG-0001	2-23-88
88-0351	1POP03-ZG-0001	2-20-88
88-0322	1POP03-ZG-0001	2-15-88
88-0165	1POP03-ZG-0001	1-31-88
88-0121	1POP03-ZG-0001	1-24-88
88-0111	1POP03-ZG-0001	1-23-88
88-0702	1POP03-ZG-0003	4-14-88
88-0639	1POP03-ZG-0003	4-02-88
88-0422	1POP03-ZG-0003	2-27-88
88-0193	1POP03-ZG-0003	2-03-88
88-0148	1POP03-ZG-0003	1-29-88
88-0146	1POP03-ZG-0003	1-28-88
88-0637	1POP03-ZG-0004	4-02-88
88-0631	1POP03-ZG-0004	3-31-88

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
1. PROCEDURAL COMPLIANCE

FCR SURVEY
4-22-88

FCR	PROCEDURE	PREPARED DATE
88-0706	1POP03-ZG-0005	4-17-88
88-0658	1POP03-ZG-0005	4-05-88
88-0646	1POP03-ZG-0005	4-04-88
88-0303	1POP03-ZG-0007	2-12-88
88-0309	1POP03-ZG-0007	2-14-88
87-2105	1POP08-FH-0002	8-20-87
87-2170	1POP08-FH-0010	8-28-87
88-0489	1POP09-AN-22M2	3-07-88
88-0090	1POP04-RC-0005	1-19-88
87-2909	1POP04-RC-0005	12-7-87

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
1. PROCEDURAL COMPLIANCE

CRITERIA

1.C.d) Temporary change process is used correctly.

ASSESSMENT

1. OBSERVATION

Over 261 FCRs were written in 1987 and 104 have been written thus far in 1988. For February and March, 60 FCRs were written as compared to 39 procedure revisions. This indicates personnel are using procedure and correcting errors encountered during use. The use of FCR's should be encouraged.

RECOMMENDATION (1.9)

Prompt follow-up on FCR's to incorporate them or show them to be invalid is required.

SUMMARY

Expedite FCR incorporation/invalidation, particularly for operating procedures.

2. OBSERVATION

Twenty-five (25) temporary changes (FCRs) were reviewed. Of the 25, 23 were greater than 14 days old. OPGP03-ZA-0002, "Plant Procedures", requires final review and approval within 14 days. Although each of the FCR's were approved within the 14 day period, the procedure does not require feedback of this approval to the user. Thus operators who use any of these 23 procedures, have no formal feedback of the final approval of the FCR prior to use.

RECOMMENDATION (1.10)

Revise the FCR program to provide for distribution of "Final Approved" copies of FCRs.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
1. PROCEDURAL COMPLIANCE

CRITERIA

2.A Effective tagout controls as indicated by:

2.A.a) Activities are authorized by appropriate operations personnel.

ASSESSMENT

1. OBSERVATION

The Shift Supervisors typically designate a Unit Supervisor to be the Issuing Authority for tagouts. The Unit Supervisor then directs tagging operations. He approves issuing, modifying, or restoring Equipment Clearance Orders.

The designated Unit Supervisor controls the activities affecting the status of installed systems and equipment for Unit #1 and common power plant equipment. These responsibilities are also well defined in the Equipment Clearance procedure, OPGP03-ZO-0001.

RECOMMENDATION

None

SUMMARY

Tagout activities are appropriately authorized.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
1. PROCEDURAL COMPLIANCE

CRITERIA

2.A.b) Tagouts and Equipment Clearance Tags in the plant indicate:

1) The scope of the tagout is still applicable.

2) The tagout is still needed.

3) Each tag is placed on the proper component.

4) Tagged equipment is in the proper position.

5) The information on tags and tagout sheets is accurate, complete and legible.

ASSESSMENT

1. OBSERVATION

Ten (10) recent Equipment Clearance Orders (ECO) were reviewed against the following criteria:

1) Comparison against applicable P&ID.

2) Physical verification of tagged components (proper position as per ECO).

3) Verification tags were in agreement with ECO form, accurate, complete and legible.

4) Each tag was on the proper component.

5) The tagout was still needed.

The results of this review is indicated on the following table.

ECO#	(1)	(2)	(3)	(4)	(5)
1-88-1213	Sat	Sat	Sat	Sat	Sat(C)
1-88-1220	Sat	Sat	Sat	Sat	Sat(C)
1-88-1219	Sat	Sat	Sat	Sat	Sat
1-88-859	Sat	Sat	Sat	Sat	Sat
1-88-1204	Sat	Sat	Sat	Sat	Sat
1-88-1206	Sat	Sat	Sat	Sat	Sat
1-88-1203	Sat	Sat	Sat	Sat	Sat
1-88-1205	Sat	Sat	Sat	Sat(B)	Sat
1-88-1084	Sat	Sat	Sat	Sat	Sat(A)
1-88-1217	Sat	Sat	Sat	Sat	Sat

Notes: (A) Restoration in progress
(B) Deviation noted as ECO release in progress
(C) Work in progress

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
1. PROCEDURAL COMPLIANCE

CRITERIA

OBSERVATION 2.A.b)(Cont.)

Based upon this review, the implementation of ECO's is satisfactory. Nothing was noted that would compromise the intent of the program. Equipment was removed from service per the ECO instructions.

There were some cases when the ECO instructions were not written in sufficient detail which resulted in local valve handwheels and control stations not being tagged and included in the ECO instructions. In addition the following minor items were noted during this review:

1) Several Requested By and Date blocks not completed.

2) One ECO independently verified but not stamped independent verification required.

3) One MWR number was not listed.

4) Required valve positions not specified as unlocked and closed, etc. for locked valves or restored as closed and capped for capped drains.

5) Inconsistency in turning charging spring motors off or leaving them on when breakers are opened and racked out.

6) Failure to use component name in addition to number on one ECO.

The attention to detail on the paperwork aspect of ECOs is improving, based upon a previous ISEG observation of ECOs. The trend is positive and several programmatic improvements were noted in the ECO program.

RECOMMENDATION (1.11)

Continued management emphasis on paying attention to detail in the ECO process.

SUMMARY

Although attention to detail needs some improvement, the tagout system is used effectively.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
1. PROCEDURAL COMPLIANCE

CRITERIA

2.B Effective control of locked valves is demonstrated in the plant.

ASSESSMENT

OBSERVATION

a) Based on review of the Locked Valve Program procedure, 0PGP03-ZO-0027, the Locked Valve Deviation Log, and discussions with operations personnel, it appears that valves important to safe and reliable operation are known and their position accurately recorded. Valves required to be locked have been identified and are recorded in the Locked Valve program procedure, 0PGP03-ZO-0027 in section 6.0, Support Documents.

The Locked Valve Program procedure requires that prior to the movement of a locked valve, specific permission must be received from the supervisor with operational control of the locked valve. The Locked Valve Program procedure also requires any locked valve that is put out of normal position be recorded in the Locked Valve Deviation Log.

b) As indicated in "a" above, communication has to take place with the Shift Supervisor/Unit Supervisor and his permission must be granted prior to movement of a locked valve. The locked valve must also be recorded in the Locked Valve Deviation Log.

Section 4.3 of the Locked Valve Program procedure requires the locked valves be checked periodically to ensure the locking devices are properly attached and the valve is in the required position. Section 4.3 also requires the Locked Valve Deviation Log be verified correct and up-to-date each time the position of the locked valves are checked. Based on review, the locked valves are being checked on a periodic basis as specified in the procedure, but the Locked Valve Deviation Log is not being checked as required.

c) A random sample of 47 valves in the locked valve program was reviewed with the following results:

1) All 47 locked valves were correctly positioned.

2) Several locked valves were locked handwheel to handwheel with another valve, essentially locking two valves with one locking device.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
1. PROCEDURAL COMPLIANCE

CRITERIA

2.B Effective control of locked valves is demonstrated in the plant.

ASSESSMENT

OBSERVATION (Cont.)

3) One locked closed valve had the locking device attached at the valve and not on the reach rod.

4) Several locked valves had MWRs written to install proper locking devices. Appropriate administrative controls were in place.

5) The locked valve deviation log does not have an "AS LEFT" position column. Several valves as left position were indeterminate.

6) Locked valve deviation log entries sometimes omitted date/initials from the block for identifying the reason it is out of required position.

7) Locking devices adequately secured all valves but two of the valves could have been closed tighter than they were.

RECOMMENDATIONS (1.12)

a) Ensure the Locked Valve Deviation Log is being checked as required. Also indicate in the Log each time the check took place.

b) Evaluate acceptability of using one locking device to lock two valves handwheel to handwheel.

c) Complete installation of permanent locking devices to currently unlockable valves.

d) Revise the locked valve deviation log form to add "AS LEFT" position and separate block for date and initials.

SUMMARY

Locked valves are effectively controlled in the plant. Improvements in the documentation of locked valves and improved locking devices for specific valves could be made.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
1. PROCEDURAL COMPLIANCE

CRITERIA

2.C Effective control of annunciators and instrumentation out of service, as indicated by:

2.C.a) Defective and out of tolerance instrumentation, alarms, and controls are properly labeled and corrective measures taken in a timely manner.

2.C.b) Degraded equipment does not adversely effect the operators ability to monitor and control plant conditions.

2.C.c) Backup instrumentation, measurements and readings are used as appropriate when normal instrumentation is found to be defective or out of tolerance.

ASSESSMENT

OBSERVATION

a) Defective and out of tolerance instrumentation, alarms and controls are identified and properly labeled. However, corrective measures to repair these items are not being taken in a timely manner. In February approximately ninety-five Maintenance Work Request tags were on the main control boards indicating deficient instrumentation, alarms and controls. At the time of the survey greater than eighty (80) Maintenance Work Request tags remained on the main control board. However, based on observations, the number of work requests written on instrumentation, alarms and controls have not adversely affected the operators ability to monitor and control plant conditions.

b) Panel operators and shift supervising personnel were observed to be using to advantage the QDPS screen presentations when reviewing point and trended system parameters. These accident screens designed for aiding the operator in accident response are routinely used to monitor status of safeguards, as well as reactor and critical secondary plant parameters during normal operations. The nature of quality sensors generally associated with the QDPS screen presentations makes them more reliable than conventional instrumentation under accident conditions. However, screen size presentation and general sensitivity results in less precise panel presentation of information for routine monitoring than does conventional instrumentation. These screens do however provide an acceptable quick review of plant status.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
1. PROCEDURAL COMPLIANCE

CRITERIA

ASSESSMENT

OBSERVATIONS (2.C Cont.)

c) Due to the large number of alarms received and the fact some provide ambiguous information, the operators have a tendency to not fully evaluate each and every alarm received. As a result, initial corrective actions to alarms maybe inappropriate. Several examples of ambiguous ERFDADS computer alarms were noted.

Point Description	Alarm Value	Limit Exceeded
RPC 1C	RUN	OFF
SG 1C FD WTR ISOL VLV	F/CLOSE	NORM
RHR PUMP 1C DISCH FLOW	LO 177.3	525 GPM
AFWP 13 DISCH PRESS	LO 20.59	125 PSIG

Each of the above alarms reflect an incorrect alarm state for the existing plant conditions. Also, in some cases annunicator windows are in a state that contradicts alarms on the ERFDADS computer alarm pages.

RECOMMENDATIONS (1.13)

a) Maintain a high level of management emphasis on closing out the excessive number of Maintenance Work Requests addressing defective and out of tolerance instrumentation alarms and controls in the control room.

b) On-shift policy and simulator training should emphasize the need to critically evaluate plant parameters using conventional in place instrumentation and to use the quality screens presentations as primarily "snap shot" information during normal plant operation.

Operators should be trained to routinely compare trended parameters with analog or digital data when determining plant conditions. Observation periods of operator performance should ensure watchstanders use all available sources of information in performing their duties.

c) Perform a complete review of the ERFDADS computer alarms and correct or eliminate alarm conditions or values as necessary.

SUMMARY

The ability to monitor plant operating abnormalities is not as effective as it should be. Design inadequacies including alarms which are in for the wrong conditions which have been left uncorrected have created a condition where the operator's response to alarms is not optimal.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
1. PROCEDURAL COMPLIANCE

CRITERIA

2.D Effective implementation of temporary modifications, as indicated by:

a) Proper placement of tags.

b) Proper markup of key drawings

c) Proper completion of modification request forms.

ASSESSMENT

1. OBSERVATIONS

Several temporary modifications were reviewed:

1) T1-DO-87-159
2) T1-CR-87-152
3) T1-FW-88-28
4) T1-CD-88-27

The following discrepancies were observed.

1) Tags were placed properly on equipment, however weathering outdoors has severely faded writing on tags.

2) Sections of the modification request form were not completely filled out.

3) Controlled drawings in Equipment Clearance Office were not marked up to show change.

2. RECOMMENDATIONS (1.14)

Correct the discrepancies observed. Ensure appropriate PED personnel are aware of requirement to update key drawings for temporary modification and design changes in the newly established Equipment Clearance Office in addition to those inside the control room.

3. SUMMARY

The temporary modification system is used effectively however, greater attention to required documentation is required.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
2. CONDUCT OF OPERATIONS

CRITERIA

3.A.a) Oral communications regarding operational activities are conducted in a professional manner so that information is transmitted accurately and reliably.

3.A.b) Verbal communications are clear concise and understandable. Appropriate feedback is used to verify transmitted information.

ASSESSMENT

1. OBSERVATIONS

Station procedure OPGP03-ZO-0004, "Plant Conduct of Operations", establishes the guidelines for communications between operating personnel. Watchstanders observed demonstrated a high level of appreciation for giving and acknowledging clear instructions. Use of two-way radios, telephone or face to face communications was observed to be in clear, relatively jargon free terms. Repeat back of instructions or reports of tasks completed, carry sufficient information or are questioned by control room personnel until understood sufficiently to ensure confidence that instructions are being carried out. Generally, the reason for performing a task is communicated with the instructions for the task. This is a good practice that increases operator familiarity with the plant and work processes.

The use of the plant paging system from the control room is minimized and then used only when contact through the two-way radio has failed.

The controlling procedure (OPGP03-ZO-0004) states "Operating personnel shall use the plant telephone system whenever possible to communicate". The largest share of operator communication is via two-way radios. Operator response in the plant is generally prompt and the "doer" can be hands-on to the task while in direct communication with control room, rather than moving back and forth between task and telephone.

2. RECOMMENDATION (2.1)

Reword OPGP03-ZO-0004 section 4.7.3 to reflect actual plant practice of principally using two-way radios.

3. SUMMARY

Communications are improving.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
2. CONDUCT OF OPERATIONS

CRITERIA

3.A.c) Equipment status changes are appropriately documented and communicated to appropriate shift positions in a timely manner.

ASSESSMENT

1. OBSERVATION

Check sheets are used to ensure proper conditions are established for each mode of plant operations and for mode shifts. Examples are Plant Operating procedures 1POP03-ZG-0001, "Plant Heatup" and 1POP03-ZG-0004, "Reactor Startup". They detail the steps necessary to maneuver the plant from mode 6 to mode 1. Step by step che as well as check sheets for mode shifts are included in the of the procedures. When the procedures are completed and sign ff they are forwarded to the document control center.

Equipment (systems) status changes are appropriately documented when required by procedures but records are not maintained in the control room to communicate current status. Also, temporary alignments necessary to meet interim conditions during plant startup or shutdown are not done in the same manner by each crew and are seldomly documented in the logs or turnover sheets.

2. RECOMMENDATIONS (2.2)

A policy should be established to ensure temporary lineups are documented regarding what was done, why it was done and when restoration is anticipated. It is also important that this information be conveyed to subsequent crews.

Additionally, the control room log should reflect initiation and completion or termination of each Plant Operating Procedure. This log entry should include procedure entrance and exit points.

3. SUMMARY

Current equipment status documentation is not consistently available in the control room.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
2. CONDUCT OF OPERATIONS

CRITERIA

3.A.d) Logkeeping is timely, accurate and adequately reflects plant activities and status.

ASSESSMENT

1. OBSERVATION

Minimum logkeeping requirements are being met. However, additional detail in the log would promote information necessary for both the plant staff and management to more thoroughly evaluate events, plant status and trends. Plant procedure 0POP01-ZQ-0030, "Maintenance of Plant Operations Logbooks", provides some guidelines but requires additional guidelines for retention of historical data.

Examples where more complete and/or additional data is needed include:

- o Grid induced generator load changes
- o Reactivity effects induced by generator load changes
- o Boration/deboration of the reactor
- o Reactor critical data, i.e., rod position, boron concentration, estimated critical conditions, method of attaining criticality (deboration/rod pull)
- o Major equipment starts/stops and why
- o Significant communications (prompt operator action required)
- o Initiation/completion and point of entry/exit of general plant procedures.
- o Alarms received that require prompt action
- o Temporary system alignments

2. RECOMMENDATION (2.3)

Upgrade plant procedure 0POP01-ZQ-0030, "Maintenance of Plant Operations Logbooks" to ensure the logbook is more representative of control room activities and to ensure that on-coming crews as well as operations management can determine previous shift activities and determine trends on critical data.

3. SUMMARY

More trend information and history of shift activities needs to be retained in the control room logs.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
2. CONDUCT OF OPERATIONS

CRITERIA

3.A.e) Turnovers conducted for each shift watchstander station effectively and accurately transfer information between shift personnel.

ASSESSMENT

1. OBSERVATIONS

Communications between shifts is addressed in OPGP03-ZA-0063, "Plant Operations Shift Turnover". Documented turnover information is contained in the following:

- o Relief checklists for SS, US, RO, Head Reactor Plant Operator, MEAB Reactor Plant Operator, TGB Reactor Plant Operator, Yard Reactor Plant Operator
- o Safety Function Checklist (Mode 1-4) or
- o Safety Function Checklist (Mode 5-6)

In addition, the Operability Tracking Log maintained by the Unit Supervisor and logbooks and log sheets maintained by the RO and RPO's provide additional material to aid in the shift turnover process. A pre-shift briefing is conducted by the off-going SS and one-on-one panel walkdowns are performed by the on-coming and off-going control room watchstanders.

Considerable time is spent on watch completing the status documents. Checklists, check sheets and log sheets reflect the condition of the plant at the time they are completed. However, subsequent plant changes are not necessarily reflected on the sheets, as for example: Temporary lineups for the MFWP's, DA, Blowdown system, and heater drain system.

2. RECOMMENDATION (2.4)

Temporary line-ups not specifically covered by procedures should be consistently documented indicating what was done, why it was done and identify the anticipated conditions for restoration to normal lineups. This information should be included in the shift turnover process.

3. SUMMARY

Good turnover practices were observed. Emphasis on temporary system alignments in the turnover process would be an improvement on otherwise existing good practices.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
2. CONDUCT OF OPERATIONS

CRITERIA

3.B.a) Operators are attentive and responsive to plant parameters and conditions. Operators are not distracted from reactor safety responsibilities.

ASSESSMENT

1. OBSERVATIONS

Panel watchstanders were observed to be attentive and responsive to plant parameters, trends and conditions, particularly so during planned evolutions. Operators, on occasion allowed their attention to be diverted by routine administrative tasks. No instances affecting reactor safety however, were observed.

Generally only one of the two control room panel watchstanders becomes involved in administrative tasks at a time. At times however, the level of control room activity involves both panel watchstanders.

Administrative work frequently occupies both Unit Supervisors and though they generally keep on eye on panel activities, there are times when they are unaware of unplanned conditions until advised by the panel watchstanders.

On occasion RPOs do advise the control room of deteriorating conditions that allows control room personnel to maneuver the plant or otherwise initiate actions to affect the problem.

Each crew exhibits a high level of interest in safe and effective operation. Lack of experience in the interactions between primary and secondary plant has led to some unrecognized transients. Examples of this would be:

- o Effects on TAVE and reactor power when picking up generator load
- o Effects on TAVE and reactor power during grid frequency upsets
- o Effects on generator load as steam drain conditions change

During these events, reactor safety was not compromised.

2. RECOMMENDATIONS

None

3. SUMMARY

Operators are well trained and prepared to safely operate the reactor and ensure under accident conditions core safety is not compromised. Additional time during power operation should enhance overall understanding of secondary plant.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
2. CONDUCT OF OPERATIONS

CRITERIA

3.B.a) Operators are attentive and responsive to plant parameters and conditions. Operators are not distrac ed from reactor safety responsibilities.

ASSESSMENT

1. OBSERVATIONS (Cont.)

On a number of occasions, when normal shift activity became difficult due to the pressure of having various test groups at control panels and computer consoles the Unit Supervisor, using firm, but polite instructions, cleared the horseshoe area of all non-watchstanders. When order was restored, the Unit Supervisor allowed necessary test personnel to resume their testing. In each case this was done with professionalism and was met with cooperation. The Unit Supervisors clearly understand their responsibility and their authority in this area, as did test personnel involved.

2. RECOMMENDATIONS (2.5)

Despite the existing administrative load, each crew should ensure there are always two sets of eyes monitoring the panels during steady state conditions. During unplanned excursions both panel watches, both Unit Supervisors and the Shift Supervisor should be in attendance as quickly as possible. A team effort should be made to address each event, in accordance with applicable procedures. A post event critique should be done and a summary of that critique written up for dissemination to each crew.

3. SUMMARY

A high level of desire to perform well is apparent in the operations staff. Use of post event critiques would improve watchstander knowledge crew to crew.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
2. CONDUCT OF OPERATIONS

CRITERIA

3.B.b) The operating conditions of plant equipment are effectively monitored, and appropriate corrective action is initiated when required.

ASSESSMENT

1. OBSERVATIONS

Operator response to alarms (annunciators) is an area in which improvement was observed over the past few weeks. Attention to and actions initiated in response to a received alarm now plays a larger roll in panel operators priorities than was observed before turbine roll/generator loading was achieved. The alarms and alarm procedures continue to require attention but operator response has improved.

Alarms received requiring prompt action are occasionally included in the control room log, but results of the action are not routinely logged.

Alarms received requiring immediate operator response are promptly responded to. If the operators assessment determines that no immediate corrective action is required, a low priority is set for actions to restore the alarmed conditions.

The large number of Maintenance Work Request (MWR) tags on control room instruments, annunciators and controls and on equipment in the plant attests to a fairly high level of effective monitoring of plant equipment by operators (recognizing some MWR tags are not placed by operators). The large number of MWR tags hung throughout the plant however, attest to a less than effective mechanism for correcting identified deficiencies.

2. RECOMMENDATION (2.6)

As an enhancement a policy of logging alarms requiring prompt operator action and the results of actions taken should be considered.

3. SUMMARY

The operating conditions of plant equipment is adequately monitored and appropriate corrective action is initiated. Timely completion of corrective actions requires improvement.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
2. CONDUCT OF OPERATIONS

CRITERIA

3.B.c) The number of alarms that are normally in a lighted or alarmed condition during power operation is minimized. Operators are able to differentiate between annunciator lights providing status information and those providing indication of alarm conditions.

ASSESSMENT

1. OBSERVATIONS

Too many annunciators are normally in the alarm condition. Several alarms indicating fault conditions are routinely lighted due to normal plant conditions, e.g., pump shut down normally, an interlock is properly made up, one out of several inputs is correctly tripped, etc. There are several examples of multi-input annunciators in the control room where a single fault (real or failed) block out subsequent annunciation. Some of these devices may have reflash capability but that information is not readily available to the operator. In addition, the annunciator system is not designed as a prioritized system. Adequate alarm prioritization requires the operators knowing which alarms require prompt investigation and which are primarily informational. But operator ability to differentiate varies with the individual. Annunciator response procedures are generally not sufficient to provide meaningful guidance for prompt response. This is a weak area.

As a result of the above conditions and the slow pace of completing maintenance in annunciator inputs, upwards of forty alarms are lighted continuously, during power operation.

The above observations on annunciators routinely lighted due to normal plant conditions also apply to ESF Status Monitoring Bypass/Inop alarms.

2. RECOMMENDATION (2.7)

Reflash capable annunciators should be identified, either by window marking or by a standard comment in each annunciator response procedure (i.e., Does (Does Not) Reflash).

A program of upgrading the annunciator system should be initiated to provide "smart" alarms (in alarm under fault conditions only) and prioritized alarms (prompt action required, corrective action advisable, or information only). This program should also include review and revision of annunciators and ESF status monitoring lights that are routinely lighted due to normal plant conditions.

CRITERIA

2. RECOMMENDATION (2.7 con't.)

A thorough review and revision of annunciator response procedures to eliminate inaccurate or incomplete information.

Design changes should be implemented to eliminate alarms being unnecessarily lighted during normal plant conditions.

3. SUMMARY

The number of alarms that are normally in a lighted or alarmed condition during power operation is minimized. Operators are able to differentiate between annunciator lights providing status information and those providing indication of alarm conditions.

Some complacency is noted in Operators response to annunciators because of the large number of relatively insignificant alarms and lights on continuously. The darkboard concept has not been fully implemented. Annunciators status lights, and associated procedures need improvement.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
2. CONDUCT OF OPERATIONS

CRITERIA

3.B.d) Operators exhibit an attitude and approach that reflects an awareness of abnormalities, unusual conditions or trends, and a determination to inquire into and follow up on indications of abnormalities and unusual conditions or trends.

ASSESSMENT

1. OBSERVATIONS

Generally the operators are alert to expected trends during planned changes in plant conditions. Deviations from the expected are discussed on crew, frequently including the STA. The phenomenon is pursued until understood and resolved by the crew. However these discussions sometimes do not carry into the oncoming crew. Training materials, P&ID's and logic diagrams are common reference materials in understanding and resolving abnormalities and unusual conditions.

Unexpected plant responses are analyzed by the operating staff until the conditions are understood. Documentation of these events and conclusions reached seldom occurs, so other crews generally do not benefit from the experience. Due to the lack of documentation, management is not always made aware an off-normal action occurred or was observed.

The operators carefully examine all operating occurrences for potential Technical Specification ramifications.

2. RECOMMENDATIONS (2.B)

Control room log entries should provide a record for all plant responses. Actions taken that preceded the event and action taken to terminate the event should be documented.

3. SUMMARY

Opportunities to share crew experiences in unexpected events have been lost because of inadequate log keeping habits. However, assessments of plant responses are generally conducted in a business like, professional manner.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
2. CONDUCT OF OPERATIONS

CRITERIA

3.B.e) Operators are capable of diagnosing plant conditions and performing required tasks during normal, off-normal and emergency conditions.

ASSESSMENT

1. OBSERVATIONS

Control room personnel were observed to monitor their assigned watch panels and initiate corrective actions as required or report trending conditions to their supervisors. Administrative tasks however occupy a good deal of their time, during which panel observation is limited. However, worsening trends on significant parameters are detected in adequate time for operator action to be effective, particularly when addressing reactor/primary side trends.

Secondary plant trends, probably due to the limited time at power operation, are less well understood and the need for corrective action is not always as prompt or specific compared to primary side upsets.

Operators, responding to an actual LOOP during the observation, performed well in ensuring the 3 cardinal points were met i.e., reactor subcritical, electrical power to essential equipment and adequate reactor heat sink. However, suitable appreciation for potential damage to secondary plant equipment was not apparent and at the time of the assessment, clear action to protect the secondary during a LOOP had not been identified for operators.

During normal plant operations at 20 to 30% power during this observation the heater drip system had not been placed in service. Operator understanding of the system needs improvement. Secondary system procedures are limited in operational scope.

Non control room personnel, in general, are familiar with the systems and equipment locations. They respond well to directions from control room and reliably carry out instructions. However, further improvement in practical operating experience at power as well as some academic improvement in secondary plant operations is still needed to achieve optimum system operation effectiveness. Frequently faults are detected during supervisory plant tours or control room indications.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
2. CONDUCT OF OPERATIONS

CRITERIA

3.B.e) Operators are capable of diagnosing plant conditions and performing required tasks during normal, off-normal and emergency conditions.

ASSESSMENT

2. RECOMMENDATION (2.a)

On-shift personnel with previous steam plant experience must play a more aggressive role in bringing the less experienced persons up to speed on secondary plant operations. All watchstanders must be made aware of the fact that nuclear plant incidents are initiated by secondary side failures.

Where procedures lead to inadequate system/operator performance, prompt critiques of events should be conducted, procedures corrected, and, if necessary training of shift personnel completed.

Develop a procedure to cover actions to be taken to protect the secondary plant during LOOP response and recovery.

3. SUMMARY

Operators are well trained and prepared to safely operate the reactor and to ensure, under accident conditions, the core is protected. More experience in power operation will significantly improve the operator's knowledge of normal and off-normal secondary plant operation .

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
3. CONFIGURATION CONTROL

CRITERIA

3.C.a) Safety systems are maintained operable and reliable to the maximum extent possible. When safety systems are bypassed, the length of time this condition exists is minimized and controls are established to ensure plant safety is maintained. Safety systems and functions are not bypassed or placed out of service without the approval of the Shift Supervisor.

ASSESSMENT

1. OBSERVATION

On shift observations indicates a high level of operator sensitivity for evaluating the effect of placing equipment in maintenance or testing modes while continuing to maintain adequate systems in service to meet license requirements.

The acceptance or rejection of planned preventative or routine maintenance and surveillance testing is also done with an eye towards minimizing the number of times critical equipment is removed from service. This effectively controls retest requirements and aids in ensuring that cross-train testing is avoided.

Requests to perform preventive or routine maintenance are frequently rejected on the basis these activities must be coordinated with all groups (electrical, mechanical, instrumentation and control, chemical analysis, etc.).

Although they use considerable operator time in their execution, the "Safety Function Checklist", OPGP03-ZA-0063 and "Operability Tracking Log", OPOP01-ZQ-0030 do aid in keeping operators aware of vital systems status and ensures documentation of Shift Supervisor approval to remove safeguard equipment from service.

2. RECOMMENDATIONS (3.1)

Work scheduling activities should be improved to ensure that preventive maintenance by all groups is coordinated to immediately precede regularly scheduled surveillance testing of safeguard systems or equipment. Further, any unscheduled surveillance testing made necessary for any reason should be performed only after as many PM's as practical have been completed.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
3. CONFIGURATION CONTROL

CRITERIA

3.C.a) Safety systems are maintained operable and reliable to the maximum extent possible. When safety systems are bypassed, the length of time this condition exists is minimized and controls are established to ensure plant safety is maintained. Safety systems and functions are not bypassed for placed out of service without the approval of the Shift Supervisor.

ASSESSMENT

3. SUMMARY

Operators are adequately aware of the need to maintain safety systems operable during maintenance and surveillance testing and apply themselves to that end. The work scheduling system requires improvement to ensure preventive maintenance is completed without causing unnecessary surveillance testing.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
3. CONFIGURATION CONTROL

CRITERIA

3.C.b) The operating conditions of plant equipment are effectively monitored and appropriate corrective action is initiated when required.

ASSESSMENT

1. OBSERVATIONS

Operating conditions of plant equipment as indicated on control panels in the control room are monitored frequently. Changing plant conditions are detected and responded to. The administrative work load for control room personnel does, on occasion, delay detection of unexpected trends. Control room operators are inclined to monitor accident monitoring instrumentation and base much of their plant status awareness on this and other computer screen information. Because of the large amount of information available on the main panels of the control room trend recorders located on control room back panels are not used extensively. When upsets occur due to grid disturbances, condenser vacuum surges, condensate system upsets, changes in turbine loading, etc., most operators have to be reminded to check these recorders as part of the trend evaluation. These recorders are not always time dated when transients occur. As with control room log keeping shortcomings, transient analysis history is being lost.

Operating outside of the control room is performed by RPO's and conditions are periodically monitored by the Shift or Unit Supervisors or other control room personnel. RPO's follow instructions well but require more fundamental plant knowledge to be fully effective at detecting system trends or gradual degradation of performance of equipment. Supervisor and RO inspections are generally specific in nature, i.e., to investigate identified problems. When general tours are conducted, Maintenance Work Requests are frequently initiated, indicating in-depth reviews of plant conditions. RPO's also frequently generate MWR's after discussion with control room personnel for equipment, system or instrument repairs.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
3. CONFIGURAITON CONTROL

CRITERIA

3.C.b) The operating conditions of plant equipment are effectively monitored and appropriate corrective action is initiated when required.

ASSESSMENT

2. RECOMMENDATIONS (3.2)

Control room watch standing practice and training should emphasize the importance of using all available instrumentation when evaluating system upsets. Installed trend recorders should be time dated and a short statement of cause for each unplanned or test initiated trend change.

The three on-watch supervisors should work out a planned plant tour schedule that would ensure all accessible plant areas are inspected by each crew over a shift cycle. These tours should include one-on-one sessions with each RPO during their rounds and during their routine walk-throughs.

RPO's require practical, real time training in STP specific plant fundamentals to enhance their ability to effectively monitor the plant.

3. SUMMARY

Current operating practices in plant monitoring is satisfactory but there is room for improvement in control room and in-plant watchstanding techniques.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
3. CONFIGURATION CONTROL

CRITERIA

3.C.c) Operators follow good operating practices in conducting plant operations, including industrial safety and radiological protection.

ASSESSMENT

1. OBSERVATIONS

In general the station policies for industrial safety are understood and complied with. Hard hats, safety glasses, and adequate leg/arm covering is generally the rule with few exceptions. However, an active safety group serves as reminder in this area. Platforms are not provided at many of the frequently operated valves, therefore operators and equipment are frequently hazarded by persons standing on lagged pipes, electrical conduit, control boxes, etc.

The division of work responsibilities at STP is such that operators are only infrequently involved in areas subjected to radiological restrictions. Tasks in these areas are primarily assigned to others. Operators are not, as a matter of routine, gaining experience in dealing with radiation or contaminated work areas. From a personnel ALARA consideration this is a good practice. From a practical perspective, as the plant ages, as refueling activities take place, and as crud traps and spills in containment as wells as general contamination events occur, a wider zone of contaminated/radiation areas is likely to be created. Operator awareness of working in this changed environment will present a challenge for crew supervision to control exposures.

2. RECOMMENDATION (3.3)

Crew supervision should play a larger role in ensuring operators are suitably dressed to work in a steam plant and consistently wear provided safety equipment.

Some valves cannot be reached from the floor or platforms and are too large and/or slow operating to permit use of a ladder. Scaffolding or platforms should be provided.

Ensure operators are assigned tasks in radiologically controlled areas, to assure familiarity and confidence in their ability to perform under these conditions.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
3. CONFIGURATION CONTROL

CRITERIA

3.C.c) Operators follow good operating practices in conducting plant operations, including industrial safety and radiological protection.

3. SUMMARY

Industrial safety practices are generally good.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
3. CONFIGURATION CONTROL

CRITERIA

3.C.d) Independent verification of component position is performed for components and systems important to safe and reliable plant operation.

ASSESSMENT

1. OBSERVATION

Station procedures are in place detailing the requirements of the independent verification program. OPGP03-ZA-0010, "Plant Procedure Compliance, Implementation and Review", details independent verification rules and lists the minimum systems involved. OPGP03-ZO-0004, "Plant Conduct of Operations", tasks Operations to perform independent verification in accordance with OPGP03-ZA-0010 and identifies certain exceptions the Shift Supervisor can apply.

Completed checklists are copied then the original is forwarded to Document Control and the copy is retained in files adjacent to the control room.

Review of five sets of safety related systems independent verification forms indicates a number of exceptions taken to prescribed lineups with the notation applicable to plant condition pre-mode 1 operations.

2. RECOMMENDATIONS (3.4)

A review should be made of dual verification check sheets to ensure that exceptions taken to the lineups premode 1 operation are still valid.

Exceptions to safety related system lineups should be correlated to mode changes. When mode changes require restorations, updated lineups should be made. Current, completed, independent verification exceptions should be validated for mode 1 operations.

3. SUMMARY

Independent verification is adequate to support operation above 50% power.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
3. CONFIGURATION CONTROL

CRITERIA

3.C.e) Check sheets or other comparable means are used to ensure that proper conditions are established for each mode of plant operation and from mode changes.

ASSESSMENT

1. OBSERVATION

Plant startup procedures contain check sheets that lists systems and associated system procedure numbers that must be aligned as a prerequisite for entering into the next mode. This entails actually performing the system lineups or verification that existing lineups in the control room files are still valid. A Shift Supervisor signature is required as certification the required lineups are completed.

Procedures permit exceptions to system lineups based on plant condition as authorized by the Shift Supervisor of record when the lineup is completed. Some lineups are completed well ahead of mode change and exceptions are not required to be correlated to mode status.

2. RECOMMENDATION (3.5)

Validate current completed procedures required for mode changes to ensure exceptions taken, that were valid at the time are still valid.

3. SUMMARY

Several reviewed system lineups show exceptions taken under less than mode 1 conditions. A review is necessary to ensure current, completed, startup check sheets are valid.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
3. CONFIGURATION CONTROL

CRITERIA

3.D Effective Technical Specification compliance, as indicated by:

3.D.a) Entry into and compliance with action statements is documented.

3.D.b) The Shift Supervisor is cognizant of entry into action statements.

3.D.c) Adequate review is performed to establish correct action statements to enter.

3.D.d) Appropriate operating personnel are appraised of LCOs and actions for which they are responsible.

ASSESSMENT

OBSERVATIONS

a) Entry into and exit from Technical Specification action statements are routinely logged into the control room Logbook. The Primary-side Reactor Operator is responsible for ensuring appropriate entries are made in the control room Logbook. OPOP01-ZQ-0030, "Maintenance of Plant Operations Logbooks", also require these entries.

The Operability Tracking Log is used to compile information needed to assess the operability of systems and components needed to fulfill Technical Specification Limiting Conditions for operation. The Unit Supervisor is responsible for ensuring Operability Tracking Log entries remain up-to-date. This log and its use is describe in OPOP01-ZQ-0030, "Maintenance of Plant Operations Logbooks".

b) The Unit Supervisor, Shift Technical Advisor and the Shift Supervisor are knowledgeable of inoperable equipment condition's and they also are involved and approve actions to be performed by signing the Operability Tracking form. This is also required by OPOP01-ZQ-0030, "Maintenance of Plant Operations Logbooks". during turnover or shortly after turnover the unit Supervisor and the Shift Supervisor (on coming) review the Equipment Out of Service Log and the Control Room Log. This is also required by OPGP03-ZA-0063, "Plant Operations Shift Turnover".

c) There is considerable review and discussion on establishing correct action statements by the Shift Technical Advisors, Unit Supervisors , Shift Supervisors and other personnel. The Technical Specification Interpretation manual is of considerable help in this area. However, it has historically taken an excessive amount of time (six months in one case) to obtain an update to the Specification Interpretation.

PLANT OPERATIONS 50% POWER OPERATIONAL SELF ASSESSMENT
3. CONFIGURATION CONTROL

CRITERIA

3.D.d) Appropriate operating personnel are appraised of LCOs and actions for which they are responsible.

ASSESSMENT

OBSERVATIONS

d) Based on review, appropriate operating personnel are appraised of LCO's and actions for which they are responsible. For example, the Primary Side Reactor Operator is involved in the initial discussions on assessing the operability of systems. When a decision regarding operability is made he records the information in the Reactor Plant Operator Logbook. When he comes on watch he attends the preshift briefings and is updated on LCO's at that time. Prior to relieving the watch he reviews the Operability Tracking Log and the Reactor Plant Operator Log that the appropriate LCO information. The Shift Technical Advisor, Unit Supervisor and Shift Supervisor are involved in the initial discussions on actions to be performed. They are also updated prior to assuming the watch at the preshift briefings and during shift turnover. This is done by review of the Operability Tracking Log prior to shift turnover and by review of the Reactor Plant Operator Logbook just after turnover.

RECOMMENDATIONS

a) None

b) None

c) Reduce the time it takes to process a Technical Specification Interpretation request. These Technical Specification Interpretations are extremely helpful to the Supervisors on shift.

d) None

SUMMARY

Evaluation of system status to ensure compliance with Technical Specifications is performed in a timely manner by the responsible watchstanders. Suitable documentation is maintained and appropriate operating personnel are apprised of LCO conditions.

EVALUATION OF MAINTENANCE/WORK CONTROL

APPENDIX B

50% Assessment of Maintenance
and Work Control Activities

Assessment Data

1. Plant Material Condition
2. Work Control System
3. Conduct of Maintenance
4. Preventive Maintenance
5. Maintenance History
6. Materials Management
7. Maintenance Personnel Knowledge and Performance
8. Supplemental Assessments
9. Action Item List

Performance Objective - No. 1 Plant Material Condition

The material condition of the plant is known and maintained to support safe and reliable plant operation.

Criteria

A. Material deficiencies are identified and are in the Work Control System.

B. Systems and equipment are in good working order, including the following:

1. Fluid system leaks are minimized.

2. Instruments, controls, and associated indicators are calibrated, as required.

3. Equipment out of service is minimized.

4. Total Corrective Maintenance items are minimized.

Summary:

Two significant items were identified in this area. The total number of Main Control Board (MCB) corrective maintenance items that have been identified is considered high. The Plant Operations personnel have determined that the actions are such that operator actions will not be impaired and as such this is not a restraint to operations above 50% power. A MCB task force is being established to address this issue.

The second significant item was a mismatch in those material deficiencies tagged in the field and the corresponding MWR identified in the Work Control System. A larger than desired error rate was identified for tagged items versus the data base. Insufficient discipline in the control and removal of MWR tags is indicated. This area also is to be reviewed, although it is not judged to be a restraint to operation above 50% power.

Method:

This area was assessed by Management Personnel in the IPS Department, field walkdowns and random review of MWR's by a Maintenance Specialist, and historical reviews and trends of plant deficiencies.

Discussion:

Material deficiencies are identified and are in the Work Control System. Two assessments were made, one by Operations personnel and one by Maintenance personnel. The walkdown of selected areas of the plant identified deficiencies that were tagged and in the work control system. The performance objective, however, is being met. A small percentage of new deficiencies were identified that were not previously identified. Some components still had tags that were work items that had been previously worked off. A weakness was identified in the consistency of the items tagged in the field and a MWR identified in the Work Control System. A review of this area will be made to ensure that items have been properly tagged.

Fluid System leaks have been minimized to the extent practical to allow safe operation of STPEGS. This has been completed by a programmatic approach to overall leak repair. The leaks were identified by walkdowns during the plant conditions that would best allow leak identification (i.e. the Systems were placed in various operating conditions so that all components were pressurized). During the Zero Power and Low Power Physics testing, as well as the time period from Fuel Load through the various operational modes, the maintenance crews were assigned Maintenance Work Requests to repair the various leaks. Leaks are continued to be identified. A periodic review of the leaks and their status is made to ensure any adverse trends are addressed. Routine review in the plant is made to identify new leaks.

Although, not all leaks have been repaired, the remaining leaks have been quantified and categorized as to their severity, overall importance to systems and safety, and as to the plant conditions that must be met to repair the leaks. The Work Control Center is accordingly prioritizing and issuing the work to the field to complete leak repair as one of the plant's overall priority items.

The total number of leaks, as shown on the charts, "Rad Leak Summary" and Non Rad Leak Summary," is a very conservative number. This is because leaks are identified and tracked even if indications of previous leakage exist but are not leaking when found. This approach to date has proven effective and practical for continued operation of the plant.

A review of the instruments, controls, and indicators associated with the Main Control Boards (MCB) indicates that the total number outstanding is not satisfactory. During the past four months, 221 Maintenance Work Requests (MWR's) involving Main Control Board (MCB) items have been satisfactorily completed. During this same time period, 289 MCB MWR's were newly identified. Our current backlog of MCB MWR's remains high at 104 items. This number if left un-reduced represents an unacceptably high number of MCB items for the control room operators to deal with on an ongoing basis.

Current efforts of the Work Control Center will be maintained such that MCB items will continue to be worked off. The increased frequency of identification of MCB items requiring corrective maintenance is directly related to the power ascension program where components are being subjected to actual operational loads for the first time. Once this period has passed, the identification of new MCB MWR's should significantly taper off such that the current work off rate will effectively eliminate the backlog. Although MCB items are in and of themselves a high priority work item, operational and managerial input into the Work Control Process ensures that the items most important to health, safety, and operations are worked first rather than being unjustly backlogged. Special efforts are being taken to address the MCB items. A task force will be established to address the MCB backlog of corrective maintenance and other items that have been identified by the operational assessment. This task force will also review this area to ensure proper prioritization and acceptable trends.

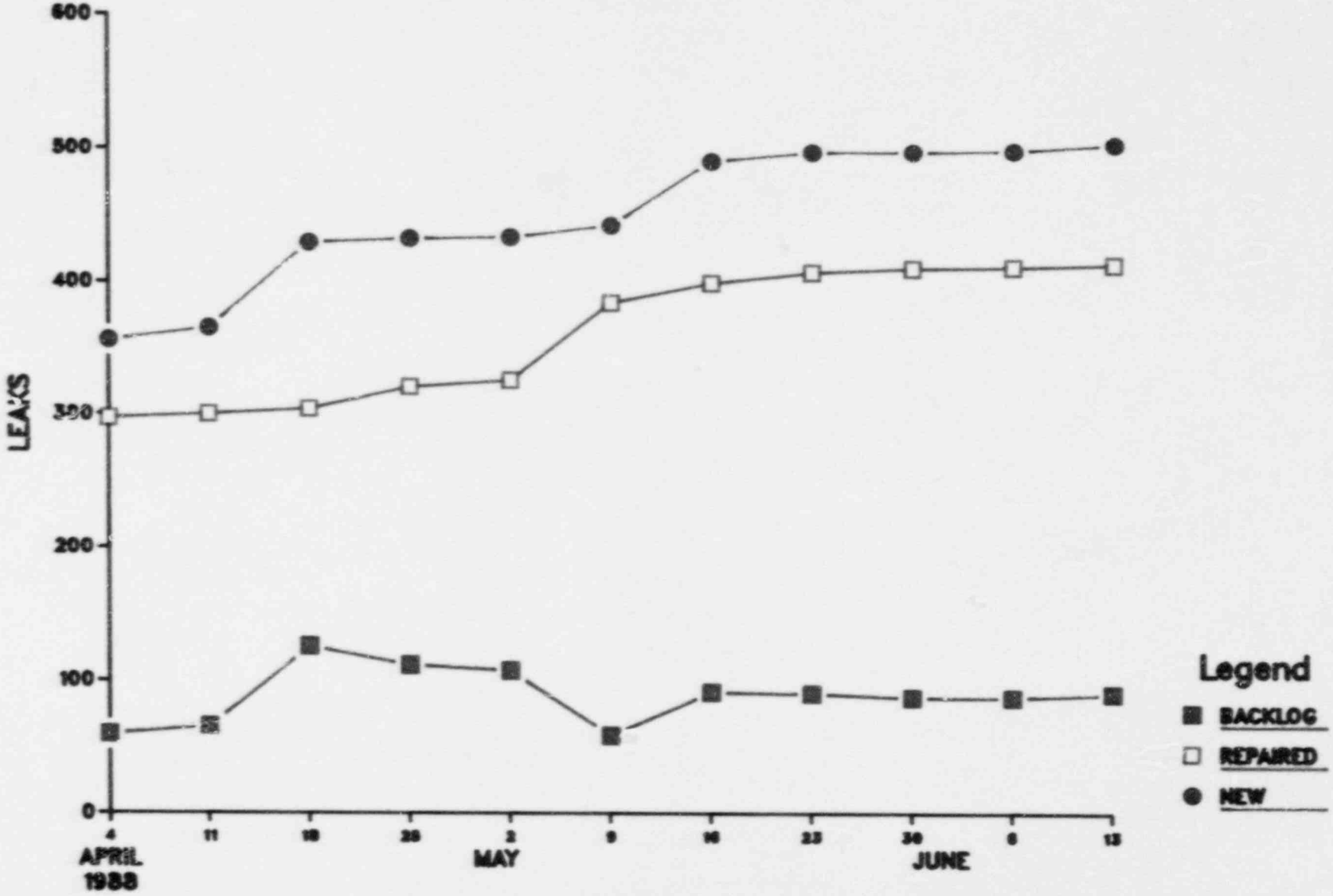
Equipment out of service is being minimized. Equipment out of service has been assigned a high priority in the STP Maintenance Program. The Work Control Center uses these priorities as a critical indicator in the scheduling of work. In addition, the daily Plan of the Day meetings when senior managers additionally identify such concerns for feedback to the Work Control System, provides a high degree of attention to returning equipment to service. The chart, Total Corrective Maintenance MWR Received and Completion History, indicates that the trend of out of service equipment, (EQ.OC) is kept to a low level and the trends are acceptable.

The total Corrective Maintenance items are being minimized to the extent practical to continue safe operation of STPEGS. The total number of MWR's is misleading in that the policy regarding issuance of MWR's tends to inflate the number. MWR's are issued for the following reasons: Traditional operator items such as board cleaning, topping off oil reservoirs, re-lamping, etc.; Contingency MWR's prepared so that the necessary job preparation is completed in the event that Maintenance is called to work immediately on equipment being tested; MWR's that are written by Operations in order to ensure documentation of specific action items; MWR's that are written for the future implementation of plant modifications [i.e. an intentional backlog item]; MWR's that are written to provide generic manpower support for operations or testing; MWR's for systems and subsystems are normally written component by component in order to ensure a better work history file record.

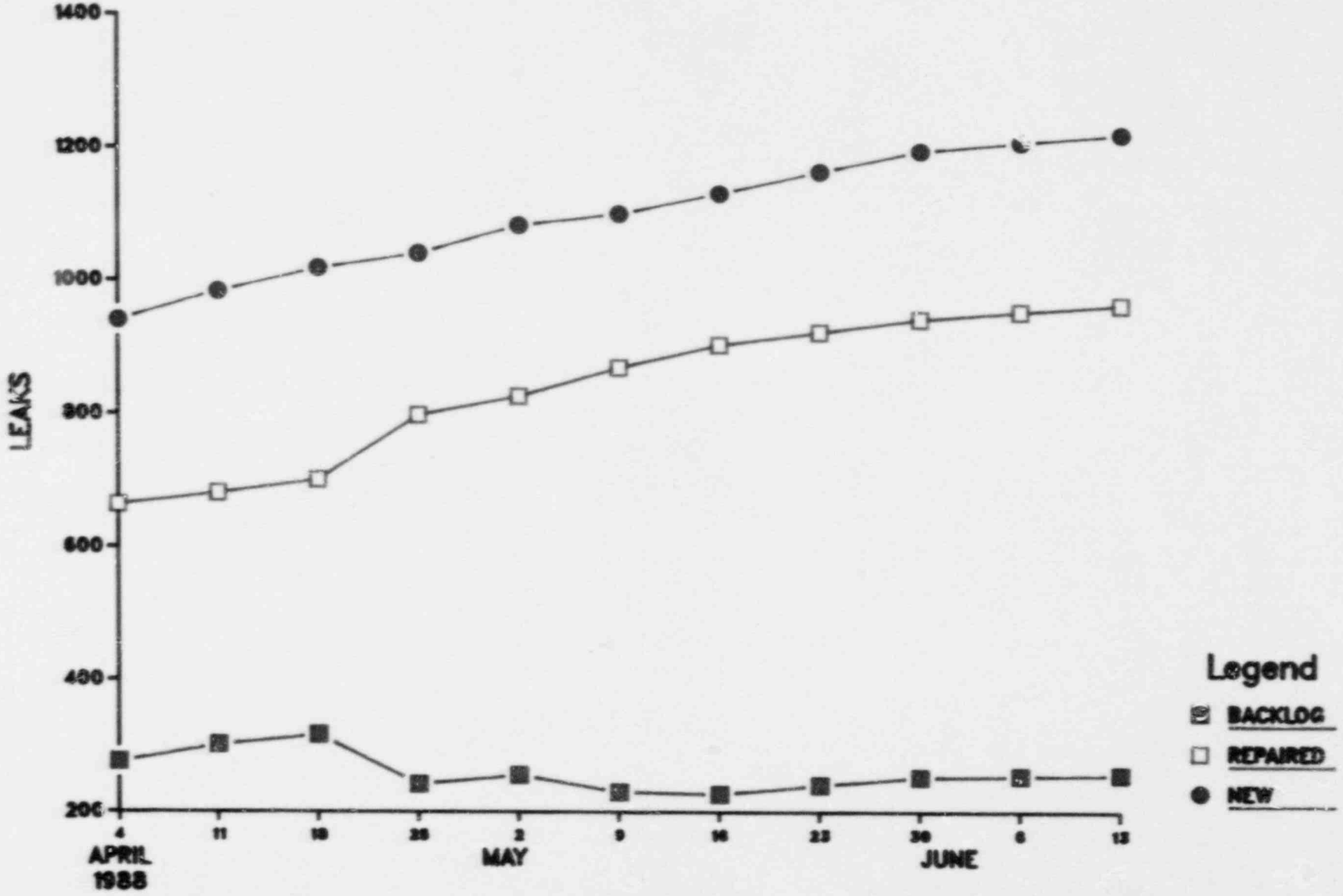
The "corrective" maintenance backlog is still higher than desirable on an ongoing basis but it is manageable. The high number of corrective maintenance actions is due to the following: During the power ascension program as many systems and components are being placed into actual operation for the first time, high failure rates exist and an aggressive program of writing MWR's is used as systems are closely monitored. Plant availability restrictions and manpower availability in this same phase tend to reduce work off rates. Therefore, there tends to be peaks in the MWR backlog. As can be seen from the accompanying completion history, during the period of initial power ascension in April these trends occurred, but now have been worked down and are being held steady. It is expected that this work off rate will overtake the new MWR identification rate when the power ascension program is complete and normal day to day operations dictate a much reduced frequency of new MWR identification.

The Work Control Center (WCC) is improving its work off productivity of appropriate priority items. This is being done by ensuring proper representation to the WCC, proper prioritization, and by minimizing work, system and tag-out conflicts. The attached chart, Total Corrective Maintenance Craft Backlog History, indicates that the trend of backlog corrective maintenance is starting to trend downward. The corrective maintenance performance as shown on the Total Corrective Maintenance Performance Weekly Chart, indicates acceptable performance even though the goal is not being achieved in all cases. At present, the performance objective is being met.

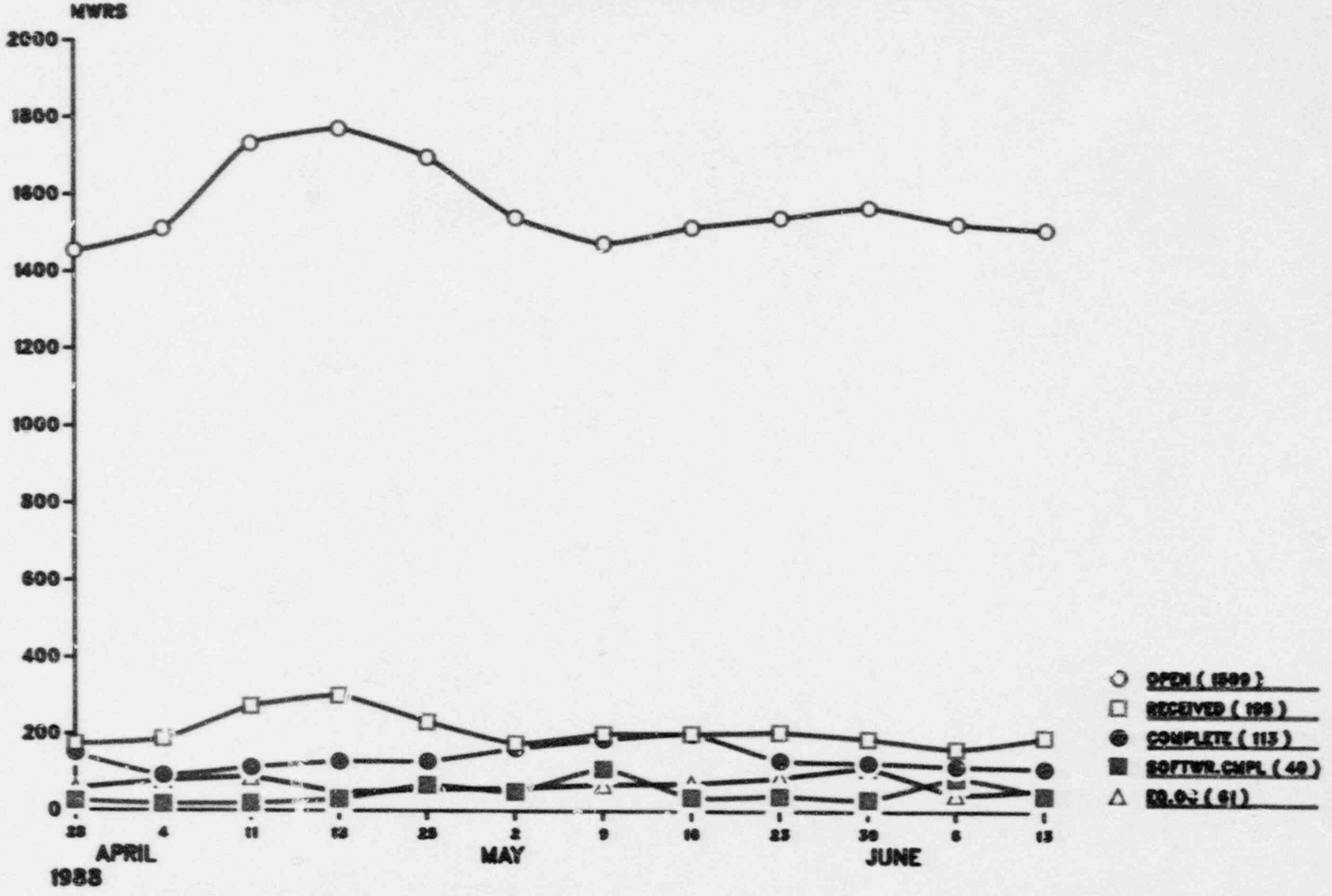
RAD LEAK SUMMARY
BACKLOG,NEW,REPAIRED



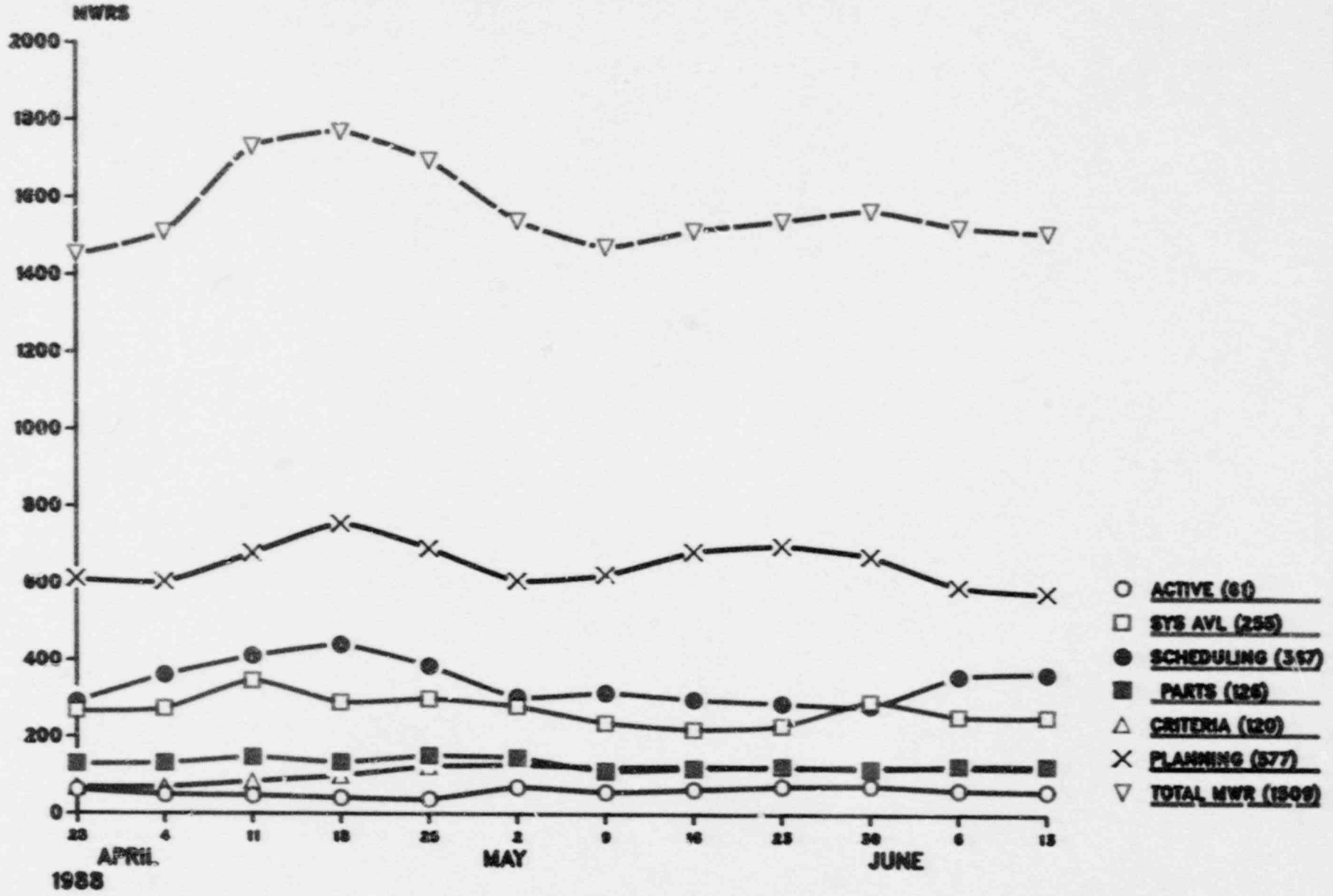
NONRAD LEAK SUMMARY
BACKLOG,NEW,REPAIRED



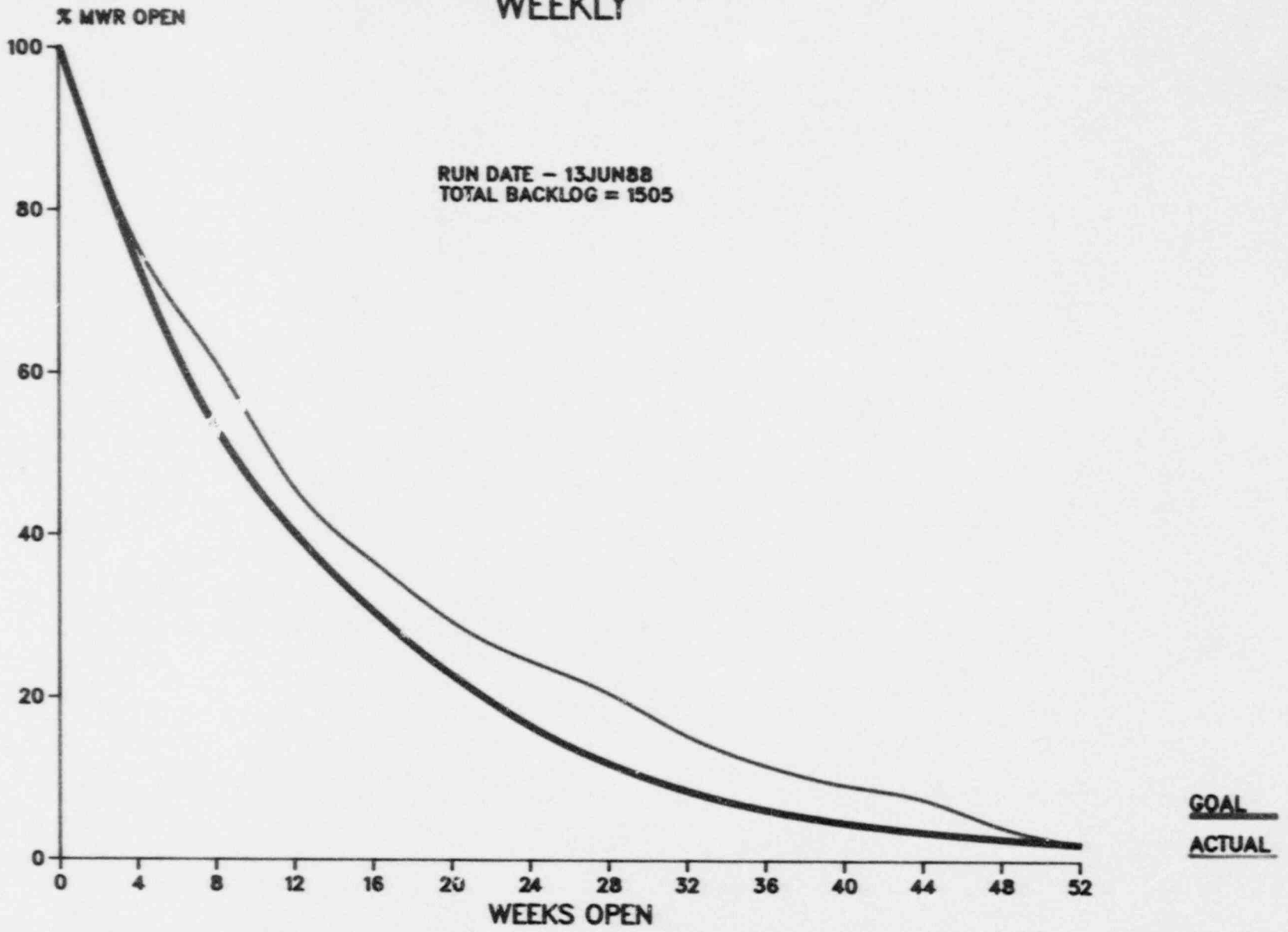
TOTAL CORRECTIVE MAINTENANCE
MWR RECEIVED AND COMPLETION HISTORY



TOTAL CORRECTIVE MAINTENANCE
STATUS OF OUTSTANDING MWRS



TOTAL CORRECTIVE MAINTENANCE PERFORMANCE WEEKLY



Performance Objective - No. 2 Work Control System

The control of maintenance work supports the completion of tasks in a safe, timely, and efficient manner such that safe and reliable plant operation is optimized.

Criteria

A. The Work Control System provides an accurate status of maintenance planning and outstanding maintenance work, both the MWR and CWR programs. The Work Control process provides Plant Management with material status.

B. Control of work is accomplished through the effective use of a priority system. The backlog of work is effectively managed.

C. Work planning including consideration of:

   a) Material, tool, and manpower requirements

   b) Interdepartmental coordination

   c) Safety considerations

   d) Radiological protection requirements; and quality control requirements.

   e) Maintenance history records and NPRDS information are considered where appropriate.

D. Work documents and troubleshooting activities are clearly defined by applicable procedures and/or instructions.

E. Advance planning is performed and routinely updated for scheduled and unscheduled outages. Included are considerations such as:

   a) Work priority

   b) Work procedures and instructions

   c) Plant/system conditions

   d) Length of outage required

   e) Prestaging of documents and material, and

   f) Coordination of support activities.

F. ALARA concepts are used in work planning to minimize man-rem exposure.

G. Coordination with other departments results in scheduling of maintenance activities which avoids unnecessary removal of equipment and systems from service and uses manpower effectively.

H. Post-maintenance testing requirements are clearly defined and include the following:

1. Clearly written test instructions.

2. Test scope sufficient to verify the adequacy of work accomplished.

3. Test acceptance criteria.

I. Post-maintenance test results are documented and reviewed by all departments to ensure proper system/equipment performance prior to returning the system to service.

J. Completed work control documents are reviewed in a timely manner to check proper completion of maintenance work and to verify that corrective action resolved the problem.

K. Items important to Health and Safety are worked in an appropriate time frame.

L. All groups affected by the work control process have appropriate input into the process.

Conclusion:

At the start of the assessment period, the coordination between the various organizations required improvement. The priority of work items and the schedules issued to the craft personnel were not always in concert with WCC schedules and direction. During the assessment period, management has taken positive steps to rectify a number of deficient areas in the work control process. Improvements have been made, and as of the end of this assessment period, the performance objective is being met.

Method:

This area was assessed by the Integrated Planning and Scheduling Department. The Independent Safety Engineering Group also performed a one week observation during the beginning of the assessment period.

Discussion:

ISEG's observations noted a number of areas requiring action. ISEG observed that MWR's were being worked which had not been processed through the WCC, there were numerous work schedules which did not always agree with the WCC schedule, WCC did not schedule all surveillance tests, WCC did not know the active status of all items in the working status, MWP packages were being received late in the shops on the day to be worked, and PM's scheduled by the WCC were not being worked. Management has addressed each of these observations and improvements have been made in all areas. The performance objective is now being met.

The Work Control System provides management with an accurate status of maintenance planning and outstanding maintenance work. Top level managers are involved in the Work Control Center (WCC) on a daily basis.

Control of work is accomplished through the effective use of a priority system. The backlog of work is effectively managed. The magnitude of the backlog is viewed as a concern but not an unacceptable one due to the proper use of our prioritization system.

Items are prioritized by the Work Control Center (except for Priority One and Emergency, which are prioritized by the Shift Supervisor) which is staffed by representatives from each affected department. This staffing allows each department's concerns to be factored into the overall prioritization and scheduling process. The newly prioritized MWR's are also reviewed on a near daily basis by either/or both the Integrated Planning & Scheduling Manager and the Plant Manager. Any concerns or comments from this review are discussed in the daily Plan of the Day Meetings which are attended by the senior managers on site. Any clarification or corrections from that meeting are immediately relayed to the Work Control Center where they are considered and factored into the prioritization and scheduling program as appropriate.

The work planning includes considerations for material, tool, manpower requirements, interdepartmental coordination, safety considerations, radiological protection, and quality control requirements. Maintenance history and NPRDS information are considered where appropriate. The work to be accomplished is controlled by a work document which provides for adequate instructions or procedures. Troubleshooting activities are also controlled by a work control document.

After assessment period ended, two maintenance related events have occurred where the Reactor Operators were not fully appraised of the scope and resulting actions of the work. The work had been authorized by Reactor Operations to be performed, but the operators were surprised when in one case, an alarm came in and the Tref signal was lost, and in the other case, an operational pump was stopped. Immediate management action was taken to correct this interface deficiency and long term programmatic changes are being developed.

Policies, together with implementing procedures, are in place to perform advance planning for scheduled as well as unscheduled outages. Recently, management action has focused the attention of the key individuals in the required organizations on the planning necessary to support the recent outage. The performance in this area is judged to be satisfactory.

The Radiation Work Permit program is presently being used to perform work in Radiologically Restricted Areas. An assessment has not been made due to minimal work being performed in this area. This area will be assessed as jobs are performed which require RWP's.

Scheduling and coordination of maintenance activities avoids unnecessary removal of equipment and systems from service and uses manpower effectively. Shortcomings in this area have been a major problem identified by several past audits. The Work Control Center implementation of improvements has made major strides recently to eliminate this problem.

The Post-Maintenance Testing Program is clearly defined and includes clearly written test instructions, adequate definition of test scope, and test acceptance criteria. Post-maintenance test results are documented and reviewed to ensure proper system/equipment performance prior to returning the system to service. The performance is now satisfactory, scheduling of post-maintenance testing had been identified earlier as a problem area requiring management attention.

Completed work control documents are reviewed in a timely manner to check proper completion of maintenance work and to verify that corrective action resolved the problem. The backlog of items awaiting final review is excessive, however, historically the amount of corrective actions resulting from this review is small. The PMT program plays a very big role in this and has helped to make sure that the work is complete before sign off.

Groups affected by the work control process have appropriate input into the process. The work control process at South Texas Project Electric Generating Station utilizes a Work Control Center. Although this center is run by the Integrated Planning and Scheduling Department, departments affected by the work process have representation consisting of experienced technically competent people who speak with the authority of their department. This collegial group determines the prioritization of work items and their associated work schedule, subject to management review.

Items important to health and safety are prioritized properly and worked in an appropriate time frame. The Work Control Center is staffed by representatives from each affected department. These representatives provide the input and coordination necessary to appropriately prioritize and schedule items to work that are important to health and safety. As a backup to this process are (1) Individual department heads bring up items that they feel may be mis-prioritized or mis-scheduled by the WCC to the Plan of the Day Meetings which are attended by the senior managers of the site. Corrections that arise from these meetings are immediately transmitted to and implemented by the WCC, and (2) The Integrated Planning and Scheduling Manager and/or the Plant Manager perform a near daily review of all new Maintenance Work Requests that have been prioritized by the WCC. Questions from this review are resolved no later than the POD and implemented appropriately. To provide an independent review of health and safety prioritization, a computer generated random sampling of the safety backlog was performed to determine if any items important to health and safety were misprioritized in the backlog. The time period covered by the sample was the 5 week period between February 15, 1988 and March 18, 1988. Ten items were randomly selected by the computer for each week for a total sample of 50 MWR's. A review of this sample was performed by the Operations Department Manager and the Integrated Planning and Scheduling Manager to determine if any item important to health and safety was incorrectly backlogged. The result of this review was that no items were identified as being incorrectly backlogged.

Performance Objective - No. 3 Conduct of Maintenance

Maintenance is conducted in a safe and efficient manner to support plant operation.

Criteria

A. Personnel exhibit professionalism and competency in performing assigned tasks that result in quality workmanship.

B. Maintenance personnel are attentive to identifying and are responsive to correcting plant deficiencies with a goal of maintaining equipment/systems in an optimum material condition.

C. Managers and supervisors routinely observe maintenance activities to identify and correct problems and to ensure adherence to station policies and procedures including industrial safety and radiation protection.

D. Maintenance Managers, Supervisors, and Craftsman actively use ALARA concepts to minimize personnel exposure.

E. Support groups such as Operations, Engineering, Quality Control, and Radiological Protection are appropriately involved in maintenance activities. Participation of these groups is coordinated to effectively support the maintenance effort.

F. Maintenance work is properly authorized, controlled, and documented.

G. Pre and Post-job briefings are effectively used.

H. Work activities are performed in accordance with controlled procedures, instructions, and drawings as required by plant policy. Craftsman and other maintenance personnel identify and provide feedback to correct procedural problems.

I. Good maintenance practices such as those listed below are followed:

   1. Proper tools and equipment are used.

   2. Good industrial safety, radiological protection, and ALARA practices are followed.

   3. Foreign materials and contaminants are excluded from open systems and equipment.

   4. Work sites are clean and orderly

J. Appropriate personnel (e.g., Operations, Engineering, and Maintenance) are aware of and perform post-maintenance testing, review results, and take corrective action, as necessary.

K. Maintenance rework is identified and documented. Corrective actions, including periodic reviews for generic implications, are taken to minimize work.

Conclusion:

One significant item was identified in this area. There were some significant delays in starting maintenance work during shift turnover and other plant evolutions. Maintenance efficiency is being reduced by not being able to get work start approval in a timely manner. This item is judged not to be a constraint to operation above 50% power. The remaining portion of the performance objective is being satisfactorily met.

Method:

This area was assessed by Supervisory personnel from the Maintenance Department performing evaluations on specific work activities in each craft, a general evaluation by a Foreman and his work crew on work activities in each craft, and a review of historical QA surveillances on maintenance activities.

Discussion:

The performance objective was satisfactorily met. The Maintenance personnel exhibited professionalism and competence in performing assigned tasks. Personnel were attentive to correction of plant deficiencies. The maintenance was properly authorized, controlled, and documented. Work was performed in accordance with controlled documents. Good work practices were demonstrated, proper tools and equipment were used. System cleanliness and work site cleanliness were observed. Appropriate post maintenance testing was performed.

At this time the demonstration of ALARA concepts and the minimization of personnel exposure has not been evaluated. There has not been enough maintenance activity in this area to effectively evaluate the results of the ALARA program, although the few jobs requiring RWP's have not identified any problems to date. As jobs arise requiring RWP's, an evaluation will be made of their performance.

A review of QA surveillances of Maintenance activities performed in 1988 demonstrate that Maintenance activities are being performed satisfactorily. Fifteen of nineteen QA surveillance results were evaluated as satisfactory with no actions required. Four surveillances identified minor deficiencies that have been corrected. No adverse trends were identified during the resolution of these deficiencies.

Some areas as noted below were seen as requiring improvement. These items, while not significant, would, if properly addressed improve the existing program. Management and supervisory time in the field observing routine work should be increased. Management observation of the high visibility jobs was evident but the more routine jobs were not observed. Improvement is needed in the level of detail in pre job briefings. Many jobs do not have a post job review. This area has been reviewed and necessary actions determined.

One personnel injury occurred during the assessment period that was a lost time accident. An I&C Technician was injured while disconnecting tubing from a pressurized system. The employee sustained a laceration to left hand injuring tendons and nerves in hand. A formal Industrial Safety Accident Investigation was conducted and a Plant Bulletin was issued cautioning all personnel of hazards associated with pressurized systems.

Performance Objective - No. 4 Preventive Maintenance

Preventive Maintenance contributes to optimum performance and reliability of plant systems and equipment.

Criteria

A. Preventive maintenance, including predictive maintenance activities, are being performed at appropriate intervals. Preventive maintenance is waived or deferred only with management approval and is appropriately trended.

B. Preventive maintenance documentation provides appropriate records of activities performed, data collected, and, where appropriate, the "as-found" and" as-left" condition of the equipment.

C. Preventive maintenance techniques and results are used to assess equipment performance. Program adjustments are made and other corrective actions are taken where needed.

D. An appropriate ratio of preventative maintenance to corrective maintenance activities exists.

Conclusion:

One significant item was identified in this area. A large percentage of identified PM's are being deferred. An initial evaluation indicates that the program at this point may be overambitious and a reduction of program scope may be required. This item, however, has been evaluated and is not considered a constraint for operation in excess of 50% power.

Method:

This area was assessed by Maintenance Department Planners and Supervisory personnel performing evaluations on specific PM activities and a general overall evaluation by a Supervisor of the overall program.

Discussion:

The performance objective was satisfactorily met. Preventive maintenance planning shows that maintenance is performed at appropriate intervals. The preventive maintenance activities and frequencies are based upon recommendations listed in associated vendor manuals, industry experience, and engineering recommendations. The frequency is based upon environmental qualification requirements when applicable. Preventive maintenance is being deferred only with proper management approval. Predictive maintenance activities are performed at appropriate intervals.

The preventive maintenance documentation does provide adequate records of activities performed, data collected, and equipment as found and as left conditions.

The results of preventive maintenance activities are used routinely to assess equipment performance. Corrective measures are taken when deficiencies have been detected by the PM, to ensure equipment availability.

The rates of preventative maintenance to corrective maintenance activities presently is approximately 30 percent. At this stage of plant life, this is judged to be appropriate.

Some areas were noted as requiring improvement. At the present time, a large percentage of PM's must be deferred. The implementation of the program to its fullest has been constrained by the amount of corrective maintenance that must be performed and the restrictions on equipment availability during the past year of startup and power ascension test program. The program at this point may be overambitious and reduction of the PM scheduling effort needs to be evaluated during the first year of operation.

Trending of PM activities is not routinely performed, although troublesome areas are evaluated on a case by case basis. The results of some predictive maintenance activities, such as oil analysis results, due to its long turn around time are not routinely recorded on the PM. This would make trending difficult in these cases. The document closure of preventive maintenance activities needs to be reviewed to determine if improvements are needed in this area. Some housekeeping zones and cleanliness class designators have been noted to be incorrect and these need to be updated before reperformance of the PM's. Documentation of the summary of work performed needs improvement to ensure adequate data is recorded for evaluation and trending. These areas will be reviewed, most before October 1988, to determine necessary actions.

Performance Objective - No. 5 Maintenance History

Maintenance history is used to support maintenance activities, upgrade maintenance programs, optimize equipment performance, and improve equipment reliability.

Criteria

A. Maintenance history records are maintained for systems, equipment, and components that affect safe and reliable plant operations and are up to date.

B. Maintenance history records, including NPRDS information, are readily available for use.

C. Maintenance history is periodically reviewed to identify equipment trends and persistent maintenance problems, and to assess their impact on station reliability. Maintenance program adjustments are made or other corrective actions are taken as needed.

Conclusion:

One significant item was identified in this area. The trending of plant deficiencies has occurred only in limited cases. Programmatic trending has not been routinely performed. The Maintenance History data base is not complete. It contains only MWR history; other types of history, for example are not factored in. The performance objective is being met to support the near term daily needs of the plant. The long term objectives at present are not being met. Even though all of the performance objective is not being met, the program is adequate to support operations in excess of 50% power. Corrective actions include a review to determine the extent of the data base and establish goals and schedules to accomplish the desired result.

Method:

This area was addressed by Maintenance Support Planners evaluations on specific activities in each craft, and a general evaluation of the program capabilities.

Discussion:

The performance objective was satisfactorily met in a limited area. Past corrective maintenance activities are being properly evaluated on a component basis since when corrective maintenance activities are completed, a summary of work performed is being entered into the history. However, the personnel and program lack sufficient guidelines to establish the necessary information to determine broad base trending analysis. In addition, NPRDS information is available, however, some of the potential users are unfamiliar with program capabilities and benefits.

The assessment determined that the historical information is utilized in a limited manner on a case-by-case basis. However, the program lacks needed information to support trend analysis.

The present program does capture the performance of preventative maintenance, corrective maintenance, and surveillance test performance, and is being used to support the planning of future jobs.

Recently, a plant deficiency trending program, OPGP03-ZE-0024, has been approved but is not fully implemented yet. Additional work is needed on the equipment data base historical input to ensure it will support the appropriate trending. This area will be reviewed to determine additional actions by August, 1988.

Performance Objective - No. 6 Materials Management

Materials management ensures that necessary parts and materials meeting quality and/or design requirements are available when needed.

Criteria

A. Proper parts and materials for work activities are ordered, received, and issued. Stock levels are adjusted, as necessary, to meet plant needs.

B. Expeditious procurement of parts and material on a high priority basis occurs when needed.

C. Methods are established to acquire replacement parts not available from the original supplier.

D. Effective material procurement status is provided including accurate stock records, tracking of purchase orders, and maintaining traceability of safety-related parts and material.

E. Materials are stored and identified in a manner that results in timely retrieval.

F. Parts and materials including consumables issued for installation are properly controlled. Unused parts and materials are promptly returned to a controlled storage area.

G. Flammable and hazardous materials are identified, segregated, and properly controlled during receipt inspection, storage, and issue.

Conclusion:

One significant item was identified in this area. The availability and staging of material appears to require excessive manpower from the craft organizations to support their work. Although material is available, often jobs are started, stopped, and restarted. This reduces the efficiency of Maintenance crews, although the necessary jobs are being performed. Although this item is evaluated as significant, it is judged not to be a constraint to operating in excess of 50% power.

Method:

This area was assessed by Supervisory personnel performing evaluations on specific work activities, a general evaluation of material availability, and a historical review of spare parts restraining work activities.

Discussion:

The performance objective is being met. Although this area had previously been identified as weak, spare parts and material are being procured and stocked to support the necessary work activities. Improvements are being made in the availability of materials. The evaluation of specific job activities demonstrated that material, although not always readily available, was obtained in a timely manner. Unit 2 has been relied upon as a source of spare parts. Actions are in progress to ensure adequate materials are available for Unit 2.

Continued attention is needed to implement the auto reorder process for consumables and spare parts. Obtaining necessary information on spare parts continues to require manpower intensive efforts to determine the part required and its availability. The historical trends for the percentage of work activities on hold due to parts availability has remained at a consistent level the past several months.

Parts and materials including consumables issued for installation are properly controlled by the work document. Unused materials are returned to a controlled storage area.

Flammable and hazardous materials are properly controlled during receipt, storage, and issue.

The staging and allocation of material can be improved to reduce the amount of effort that the maintenance personnel must expend to ensure the material is available for a job. As the material availability continues to improve, this will result in an increase efficiency in the area of the maintenance personnel activities.

Performance Objective - No. 7 Maintenance Personnel Knowledge and Performance

Maintenance personnel knowledge and performance supports safe and reliable plant operation.

Criteria

A. Maintenance is performed by or under the direct supervision of personnel who have completed applicable formal qualification associated with the tasks to be performed.

B. Maintenance personnel knowledge is evidenced by an appropriate understanding of areas such as the following:

1. Maintenance policies and procedures

2. General plant layout

3. Purpose and importance of plant/systems and equipment

4. Effect of work on plant systems

5. Industrial safety, including hazards associated with work on specific equipment/systems.

6. Radiological protection and ALARA principles

7. Job-specific work practices, including identification of proper work location.

8. Cleanliness and housekeeping practices

C. Maintenance personnel are capable of troubleshooting equipment problems in an efficient manner.

D. Maintenance personnel are knowledgeable of changes to plant policies, procedures, systems, and equipment that affect their activities.

E. Maintenance personnel are knowledgeable of appropriate lessons learned from industry and in-house operating experiences (including actual events) applicable to their craft.

F. Ensure overtime requirements are controlled and not adversely affecting performance.

Conclusion:

No significant items were identified in this area. Maintenance personnel knowledge and performance was found to be satisfactory.

Method:

This area was assessed by Maintenance Department Supervisory personnel performing evaluations on specific work activities in each craft, a general evaluation by a Foreman and his work crew on work activities in each work area, an evaluation of specific craft knowledge of program/procedure/lessons learned activities, and a historical review of overtime trends.

Discussion:

The performance objective was satisfactorily met. It was determined that maintenance was performed by or under the direct supervision of qualified personnel. The knowledge of maintenance personnel was evident in their understanding of the subjects required to perform their tasks. It was noted, however, that improvement is needed in craft knowledge and information on plant system operation and plant interactions.

The evaluation demonstrated that maintenance personnel are capable of troubleshooting equipment problems in an efficient manner. Some problems had been previously identified in this area. Troubleshooting procedures have been strengthened and revised and increased management attention has been given to this area.

During the evaluation period, a reactor trip was caused by improper troubleshooting maintenance activities. This occurred during troubleshooting being performed to determine the cause of a main generator breaker trip. The trip was the result of personnel error in failing to adequately determine all of the circuits' components and plan for resulting response by the system. Additional training of these personnel has been given in troubleshooting techniques.

It was found that when individuals were questioned about specific programs, requirements and industry experiences, they were knowledgeable of the requirements and events, although they did express some concern regarding the timeliness of changes to procedures and programs. In this area improvement is needed to ensure the affected personnel are aware of procedural changes.

The historical trends on overtime were reviewed. The review has shown that the overtime which had been heavy has been reduced. Although no evidence exists that overtime has caused problems, the actions necessary to reduce the required workload of the personnel have been addressed. Overtime is being controlled to ensure that performance is not adversely affected.

EVALUATION OF LICENSING

APPENDIX C

A. ESF Actuations

The South Texas Project Electric Generating Station has had the following ESF actuations since initial criticality.

DATE	TYPE	CAUSE/CONSEQUENCE
3/23/88	Control Room Envelope (CRE) HVAC actuated on HI Radiation	Spurious actuation/CRE HVAC actuated properly
3/30/88	Loss of offsite power/Reactor Trip/Safety Injection on Low Low Compensated T-cold Excessive Cooldown Protection	Troubleshooting error combined with design error/HL&P has modified the design. ESF equipment actuated as designed
5/6/88	CRE HVAC actuated on toxic gas	Exact cause could not be determined Available evidence suggests that a puff of HCl gas or a gaseous hydrocarbon was detected by the analyzer.

The following is a comparison of ESF Actuations between initial criticality (IC) and commercial operation (CO) for STPEGS 1 and other recent first unit Westinghouse Plants. (Data based on NUREG 1275 evaluation in Section J).

Byron 1 - 29 in 8 months between IC & CO (3.6/mo)
Calloway - 27 in 3 months between IC & CO (9/mo)
Wolf Creek - 69 in 5 months between IC & CO (13.8/mo)
STPEGS 1 - 3 in 3 months between IC & 6/8/88 (1.0/mo)

No trends have been identified relative to ESF actuations since initial criticality.

Numerous Control Room Envelope (CRE) HVAC actuations occurred early in plant operation. However, as problems were corrected and personnel became more familiar with system operation, the incidence of CRE HVAC actuations decreased substantially. The above high radiation actuation differed from previous actuations in that the cause for the spurious actuation could not be conclusively determined. The toxic gas actuation was apparently caused by the brief induction of a puff of gaseous HCl or a gaseous hydrocarbon compound which was detected by the analyzer. Efforts to identify the compound or its source were unsuccessful.

The Reactor Trip/Safety Injection actuation was caused by an inadvertent tripping of switchyard supply breakers when troubleshooting and resulted in a partial loss of offsite power. Subsequently, the excessive cooldown protection circuity actuated Safety Injection (SI). Safety systems functioned as designed; however, the SI actuation was not expected. As a result of this event HL&P determined that plant design was such that an SI actuation could be expected anytime the RCPs were stopped and charging flow was maintained. An emergency Technical Specification change was approved by the NRC on May 24, 1988 which allowed the excessive cooldown circuitry to be deleted.

B. Reactor Trips

The South Texas Project Electric Generating Station has had the following unplanned Reactor Trips since initial criticality.

DATE	CAUSE
3/30/88	Loss of offsite power caused by a troubleshooting error

The following is a comparison of Reactor trips between initial criticality (IC) and commercial operation (CO) for STPEGS 1 and other recent first unit Westinghouse Plants. (Data based on NUREG 1275 evaluation in Section J)

Byron 1	-	22	in 8 months between IC & CO	(2.75/mo)
Calloway	-	12	in 3 months between IC & CO	(4/mo)
Wolf Creek	-	13	in 5 months between IC & CO	(2.6/mo)
STPEGS 1	-	1	in 3 months between IC & 6/8/88	(.33/mo)

No trend has been identified relative to reactor trips.

The one event did highlight the need for revisions to procedures which control the preparation of troubleshooting instructions to require step by step directions, review and walkthrough before use. The loss of offsite power and subsequent power restoration identified several areas in procedures which needed improvement.

C. Technical Specification Violations

The South Texas Project Electric Generating Station has had the following Technical Specification violations since initial criticality.

	DATE	VIOLATION	CAUSE
1)	3/11/88	Inservice test for pump not performed as required by ASME Section XI	Personnel error/The surveillance interval was to be halved but it was not correctly entered into the tracking system.

	DATE	VIOLATION	CAUSE
2)	5/2/88	Plant entered TS 3.0.3 twice to perform surveillance testing on the Steam Generator PORVs	The Shift Supervisor interpreted the Technical Specification to permit the evolution.
3)	5/17/88	Preop testing deficient in satisfying TS 4.6.2.1.C.2	Preoperational test procedure inadequacy due to the uniqueness of the design feature. Additionally, inadequate technical review of the procedure and results.
4)	5/18/88	1B CCW MOV inservice Test Frequency was not doubled as required; also stroke time calculation for 1C MOV was done wrong	Inadequate procedure for tracking surveillance test packages through the review cycle.
5)	6/7/88	Inadvertent release of liquid radioactive waste in excess of Technical Specification limits	Personnel error.

The following is a comparison of Technical Specification violations between initial criticality (IC) and commercial operations (CO) for STPEGS 1 and other recent first unit Westinghouse plants. (Data based on NUREG 1275 evaluation in Section J)

Byron 1	-	23	in 8 months between IC & CO	(2.88/mo)
Calloway	-	3	in 3 months between IC & CO	(1/mo)
Wolf Creek	-	8	in 5 months between IC & CO	(1.6/mo)
STPEGS 1	-	5	in 3 months between IC & 6/8/88	(1.67/mo)

The events (1 and 4) relative to the missed inservice test were a recurrence of a problem previously thought to be corrected which would indicate insufficient root cause determination. HL&P believes the root cause has now been identified and that the corrective action will prevent recurrence. In addition, management attention has been focused on determining root cause and a root cause training program has been initiated.

Event 2 resulted in an enforcement conference and a request by HL&P for a clarification of the Technical Specification requirements relative to entry into Technical Specification 3.0.3.

Event 3 resulted from an inadequate preop test procedure due to the uniqueness of the design and does not appear to be a recurrence of previous Technical Specification problems.

Event 5 has just occurred apparently as a result of personnel error. A thorough investigation is underway.

D. LICENSE EVENT REPORTS

South Texas Project Electric Generating Station has had the following LER events since initial criticality.

	LER	EVENT DATE	EVENT CATEGORY
1.	Inservice test for pump not performed as required by ASME Section XI.	03/11/88	Tech. Spec.
2.	During review of SSPS design, it was discovered that when resetting the safeguards test cabinet master reset switch with P-4 present, SI will be blocked.	03/16/88	Design error

LER	EVENT DATE	EVENT CATEGORY
3. Plant threatened by individual: two power poles were cut down at Greenspoint, a security alert and NOUE were declared.	03/17/88	Security
4. All trains CRE HVAC went into Recirc.	03/23/88	ESF Actuation
5. Reactor Trip/Safety Injection	03/30/88	RPS and ESF Actuation
6. Various 1" valve bodies and elbows on dead legs, and drains/test connections in the ECW System leaking through wall.	04/01/88	Design Error
7. Safeguards procedures missing from safeguards repository #38.	04/04/88	Security
8. Seals on S/G PORV Hydraulic Control	04/12/88	Design Error (Manufacturing Error)
9. Plant entered Tech Spec 3.0.3 twice due to isolation of PORVS.	05/02/88	Tech. Spec.
10. Toxic gas monitor high alarm placed CRE HVAC into recirc.	05/06/88	ESF Act.
11. Cable assemblies for neutron flux monitors failed qualification testing.	05/09/88	Design Error
12. RWST charging pumps will not perform to satisfy Tech Spec boration req'mts.	05/13/88	Design Error

LER	EVENT DATE	EVENT CATEGORY
13. Preoperational testing deficient in satisfying Tech Spec 4.6.2.1.C.2.	05/17/88	Tech Spec.
14. 1B CCW MOV Surveillance Test frequency was not doubled as required; also stroke time calculation for 1C MOV was done wrong.	5/18/88	Tech. Spec.
15. Live 22 cal. shell found on turbine deck.	6/6/88	Security
16. Inadvertent release of liquid radioactive waste in excess of Technical Specification limits.	6/7/88	Tech. Spec.

Note that events 1, 4, 5, 9, 10, 13, 14 and 16 were discussed in Sections A, B, and C of this assessment.

LERs between initial criticality and commercial operation.

Byron 1	-	66	in 8 months between 1C & CO (8.25/mo)
Calloway	-	13	in 3 months between 1C & CO (4.3/mo)
Wolf Creek	-	40	in 5 months between 1C & CO (8/mo)
STPEGS 1	-	16	in 3 months between 1C & 6/8 (5.3/mo)

Eight of the sixteen LERs were discussed in previous sections of this assessment as ESF actuations, Tech Spec Violations and Reactor Trips. Three of the remaining eight are Security Events none of which represents a recurrence of a previous problem. The other items are diverse design errors. No trends are identified.

E. Comparison to Other Plants

AEOD published a report (AEOD/P604 dated August 21, 1986) which represented a systematic review of the operating experience data bases with a focus on "new plants" for the first 12 months of operation. For 19 newer units, trends and patterns, as well as plant-by-plant comparisons were prepared for RPS actuations, ESF actuations, security events, and miscellaneous events. The following discussion uses the statistical methodology developed in the AEOD report to rank STPEGS against the 19 plants reviewed by AEOD. The attached Table provides the Unit Normalized Individual Benchmark Values developed in the AEOD Report for each of the 19 plants plus a value derived for STPEGS 1.

Table Unit Normalized Individual Performance Benchmark Values

UNIT	RPS ACTUATIONS (Per 1000 Critical Hrs)		EVENT TYPES OTHER THAN RPS ACTUATIONS		
	Up To 15% Power	Above 15% Power	ESF Actuations	Security	Misc.
BYRON 1	1.91	2.00	1.92	2.25	2.25
CALLAWAY 1	1.67	2.17	2.00	4.00	1.25
CATAWBA 1	1.57	2.14	1.58	1.08	1.42
DIABLO CANYON 1	2.20	2.00	1.67	1.25	1.50
DIABLO CANYON 2	1.60	2.40	1.00	1.22	1.33
FERMI 2	2.29	1.00	2.10	2.90	1.70
LaSALLE 2	1.08	1.50	2.25	1.92	2.50
LIMERICK 2	1.00	1.00	2.58	2.33	1.83
McGUIRE 2	1.00	2.00	1.08	1.00	1.08
MILLSTONE 3			1.00	1.00	1.00
PALO VERDE 1	2.00	2.00	1.25	1.33	1.42
PALO VERDE 2			3.00	1.00	1.00
RIVER BEND	2.00	1.00	2.00	2.20	1.60
SHOREHAM			1.25	1.42	1.83
ST. LUCIE 2	1.00	1.60	1.00	1.17	1.00
SUSQUEHANNA 2	1.00	1.36	1.17	1.00	1.33
WASHINGTON NUCLEAR 2	2.10	2.25	2.92	1.42	1.33
WATERFORD 3	2.50	2.60	1.75	1.08	1.83
WOLF CREEK	1.63	1.57	2.60	1.50	1.20
STPEGS 1*	**1.33**	**1.00**	**1.67**	**1.88**	**1.44**

(NOTE: A Value of 1.00 Is Equivalent to the BEST Performance.)

* Calculated as of May 21, 1988.

ESF Actuations

An ESF Normalized individual Performance Benchmark Value of 1.67 places STPEGS 1 in a tie with Diablo Canyon 1 for 9th out of 20. The plants with better records are:

Catawba 1
Diablo Canyon 2
McGuire 2
Millstone 3
Palo Verde 1
Shoreham
St. Lucie 2
Susquehanna 2

Those plants ranked better than STP are typically either second units or units at a utility with a mature operations organization. On this basis STPEGS 1 has shown favorable performance in this category for startup of a utility first nuclear unit.

Security

The Security event Normalized Individual Performance Benchmark Value for STPEGS 1 was 1.88 which ranks STPEGS 1 14th out of 20 utilities in this category. This performance ranking is a result of several security problems in the first two months of operation which resulted in a civil penalty. These problems have since been rectified and overall security performance has improved.

Miscellaneous Events

Included in the miscellaneous category were reports of inoperative Emergency Notification Systems, events which indicated possible serious degradation in a principal safety barrier (such as local leak rate test failures), natural and external conditions that posed an actual threat to the safety of the unit (such as earthquakes, fires, and hurricanes), radioactive releases above permissible limits, discovery of unanalyzed design conditions, and occurrences or conditions that alone could have prevented the fulfillment of a principal safety function (such as the removal of residual heat).

The miscellaneous event normalized individual benchmarks for STPEGS 1 was 1.44 which places STPEGS 1 12th out of 20 ranked utilities in this category.

Reactor Trips since Initial Criticality < 15% power

STPEGS 1 has had one Reactor Trip with the reactor at less than 15% power which occurred as a result of a loss of offsite power caused during trouble shooting a generator trip on the same day as the generator was initially synchronized to the grid. The AEOD study shows that the median value for Reactor Trips in the first month of operation is zero with 1 trip being within the expected range. This results in a Normalized Individual Benchmark Value in this category of 1.33 for a ranking of 6th out of 16. However, the short time for which this category is applicable to STPEGS provides little basis for comparison.

Reactor Trips at > 15% power

STPEGS 1 has had no Reactor trips with the Reactor above 15% power. This performance gives STPEGS 1 a normalized individual benchmark value in this category equal to the best of the 20 plants in the study.

F. Station Problem Reports

STPEGS 1 received a Notice of Violation as a result of NRC's review of the Station Problem Report Program in January 1988. The concern identified in the violation centered around the backlog of past due investigations.

Additional resources were assigned to manage the program, the procedure has been revised, and overall plant management priorities were adjusted to focus more attention on completing problem reports. Management attention is focused on the status of Station Problem Reports in the Plan of the Day meetings. These corrective actions have made the program an effective tool for identifying problems and ensuring their prompt solution.

G. Root Cause Determination

Determining root cause during problem evaluation continues to require improvement. Overall, HL&P's ability to identify root cause has been adequate. However a few events such as missed post maintenance local leak rate tests and missed ASME Section XI surveillance indicate that continued management attention to developing root cause skills is needed. Most personnel responsible for root cause determinations have been provided additional training which was developed by the Independent Safety Engineering Group. A more extensive program is under development for implementation by the Nuclear Training Department.

H. SAFETY EVALUATIONS

Several events have occurred since initial criticality which required safety evaluations to justify continued operation of the unit. The first event was initially identified as through wall seepage in Essential Cooling Water (ECW) System valves and fittings. As a result of further review the cause of this condition has been determined to be ~~dealuminization~~ dealloying due to inadequate heat treatment limited to cast fittings and valves two inches and smaller. A safety evaluation was developed, and continued operation was found to be acceptable by HL&P. The NRC reviewed and concurred with this conclusion.

The second event came as a result of a root cause determination on several O-rings failures in Steam Generator PORV's, HL&P discovered that the O-rings supplied were made of the wrong material (BUNA-N versus Viton). A safety evaluation was developed based on the life expectancy of BUNA-N in this service combined with additional monitoring of the PORV's for seal degradation until the O-rings could be replaced. Again continued operation in the short term was found acceptable by HL&P.

The third event occurred earlier in the year as STPEGS experienced a destructive failure of a sleeve in an AFW pump. It was found that the sleeve was made of a type of steel which is prone to stress corrosion cracking and hydrogen embrittlement. A safety evaluation was developed based on the ability to monitor the performance of the pumps and operation is continuing in the near term pending replacement of the inadequate sleeve material.

As a result of these experiences HL&P has determined that procedural guidance for preparing safety evaluations is needed to ensure quick and complete response to situations which require a justification for continued operation. HL&P was slow to recognize the need for and to develop a sufficient justification for the ECW issue. Although timeliness was not a problem on the PORV's, the completeness of the evaluation was in question because of the omission of effects on equipment qualification. The procedure currently used for the process is designed for Unreviewed Safety Question Evaluation pursuant to 10CFR50.59 and is not precisely suited for developing JCO's.

Engineers experienced in application of both design and licensing criteria will be assigned to monitor the development of future safety evaluations. It is expected that their efforts will result in a general upgrading of the quality, uniformity and completeness of those safety evaluations completed in support of justifications for continued operation as well as safety evaluations performed in support of proposed plant modifications.

I. Commitment Tracking System

HL&P has developed a commitment tracking system that has been in use for a number of years to help ensure NRC commitments are met. Some recent Notices of Deviation have indicated the need for a review of the system and the technique for ensuring that letters to the NRC are accurate. This review identified several cases where the procedure for review of letters prior to submittal was not followed as closely as it should have been. The procedure has been revised to enhance verification of statements of fact and tracking of commitments. A 14 day look ahead on NRC commitments is being provided daily in the Plan of the Day Meetings to ensure management is aware of upcoming due dates.

J. NUREG 1275 Evaluation

The following parameters for STPEGS 1 were compared to the data provided in NUREG 1275.

* Technical Specification Violations

* ESF Actuations

* Reactor Trips

* Loss of System Safety Function

STPEGS has experienced a higher than average number of Technical Specification Violations. (See Table 1). However, as shown on figure 1, the event rate has decreased and appears (based on the last two months) to be showing a trend closer to that expected for more mature plants. This improvement is a result of aggressive actions taken by HL&P to remedy the problems associated with Technical Specification compliance. The repetitive nature of the events was indicative of inadequate root cause determination for early Technical Specification violations.

The ESF Actuation Rate at STPEGS compares favorably with other Westinghouse Plants. (See Table 2 and Figure 2).

The Unplanned Reactor Trip Rate for STPEGS 1 is better than that shown for other Westinghouse Plants. (See Table 3)

The Average Rate for Loss of System Safety Function as identified by the number of LERs reported pursuant to 10CFR50.73 (a)(2)(vii) is 0.77 per month. This rate is comparable to that for other plants.

The assessment performed for sections A through D as tabulated here is based on data extracted from NUREG 1275. This data base is independent and readily available for interested parties to review. An assumption had to be made in extracting data from the NUREG in that specific numbers of events between initial criticality and commercial operation is not provided. Instead, the data provides the total number of events per month. Events which were identified as occurring in the month of initial criticality were considered to occur after initial criticality, and events which where identified as occurring in the month of commercial operation were considered to occur prior to commercial operation. This will result in a larger number of events and could skew the data in the high direction. However, when establishing an average number of events per month during this phase of plant operation, this assumption is not expected to alter significantly the concluson.

Plants which are second units or are from seasoned nuclear operating utilities would be expected to show substantially better performance than a utilitiy starting its first nuclear unit. Therefore, the following criteria was chosen to select plants for comparison to STPEGS 1 in sections A through D.

This criteria identifies plants for which STPEGS would be expected to be comparable.

Covered in NUREG 1275

- Large four loop Westinghouse Plant
- Recent vintage (licensed in last several years)
- The operating utilities' first recent vintage large four loop Westinghouse Plant

Table 1
Average Technical Specification Violation Rates

Plant	Pre-Commercial Events/Month
Westinghouse	
Byron 1	4.22
Callaway	1.57
Catawba 1	2.51
Diablo Canyon 1	1.20
Diablo Canyon 2	1.31
McGuire 2	2.55
Millstone 3	1.63
South Texas 1	**2.77**
Wolf Creek	1.88
Combustion Engineering	
Palo Verde 1	4.47
St. Lucie 2	1.45
Waterford	1.50
General Electric	
LaSalle 2	1.17
Limerick 1	2.85
River Bend	2.37
Susquehanna 2	1.10
WNP-2	3.26
Average	2.19
W Average*	2.11

* Excluding South Texas 1

Note: South Texas 1 data valid as of 5/21 2400.

Table 2
Average ESF Actuation Rates

Plant	Pre-Commercial Events/Month
Westinghouse	
Byron 1	6.08
Callaway	7.00
Catawba 1	3.30
Diablo Canyon 1	1.38
Diablo Canyon 2	1.89
McGuire 2	0.15
Millstone 3	2.44
South Texas 1	**2.44**
Wolf Creek	13.30
Combustion Engineering	
Palo Verde 1	3.25
St. Lucie 2	0.24
Waterford	3.21
General Electric	
LaSalle 2	4.59
Limerick 1	7.14
River Bend	6.90
Susquehanna 2	1.47
WNP-2	7.02
Average	4.33
W Average*	4.44

* Excluding South Texas 1

Note: South Texas 1 Data valid as of 5/21 2400

Table 3
Average Unplanned Reactor Trip Rates

Plant	Pre-Commercial Scrams	Critical Hrs	Trips 1000 Critical Hours
Westinghouse			
Byron 1	22	3746	4.87
Callaway	12	1243	9.65
Catawba 1	9	2266	3.97
Diablo Canyon 1	12	2745	4.37
Diablo Canyon 2	17	2474	6.87
McGuire 2	11	3724	2.95
Millstone 3	8	924	8.66
South Texas 1	**1**	**795.6****	**1.26**
Wolf Creek	11	1746	6.30
Combustion Engineering			
Palo Verde 1	13	3437	3.78
St. Lucie 2	6	1101	5.45
Waterford 3	21	1812	11.59
General Electric			
LaSalle 2	9	3871	2.32
Limerick	4	4862	0.82
River Bend	16	3541	4.52
Susquehanna 2	7	3794	1.85
WNP-2	23	3950	5.82
Average*			5.30

* Excluding South Texas 1
** As of 6/8/88

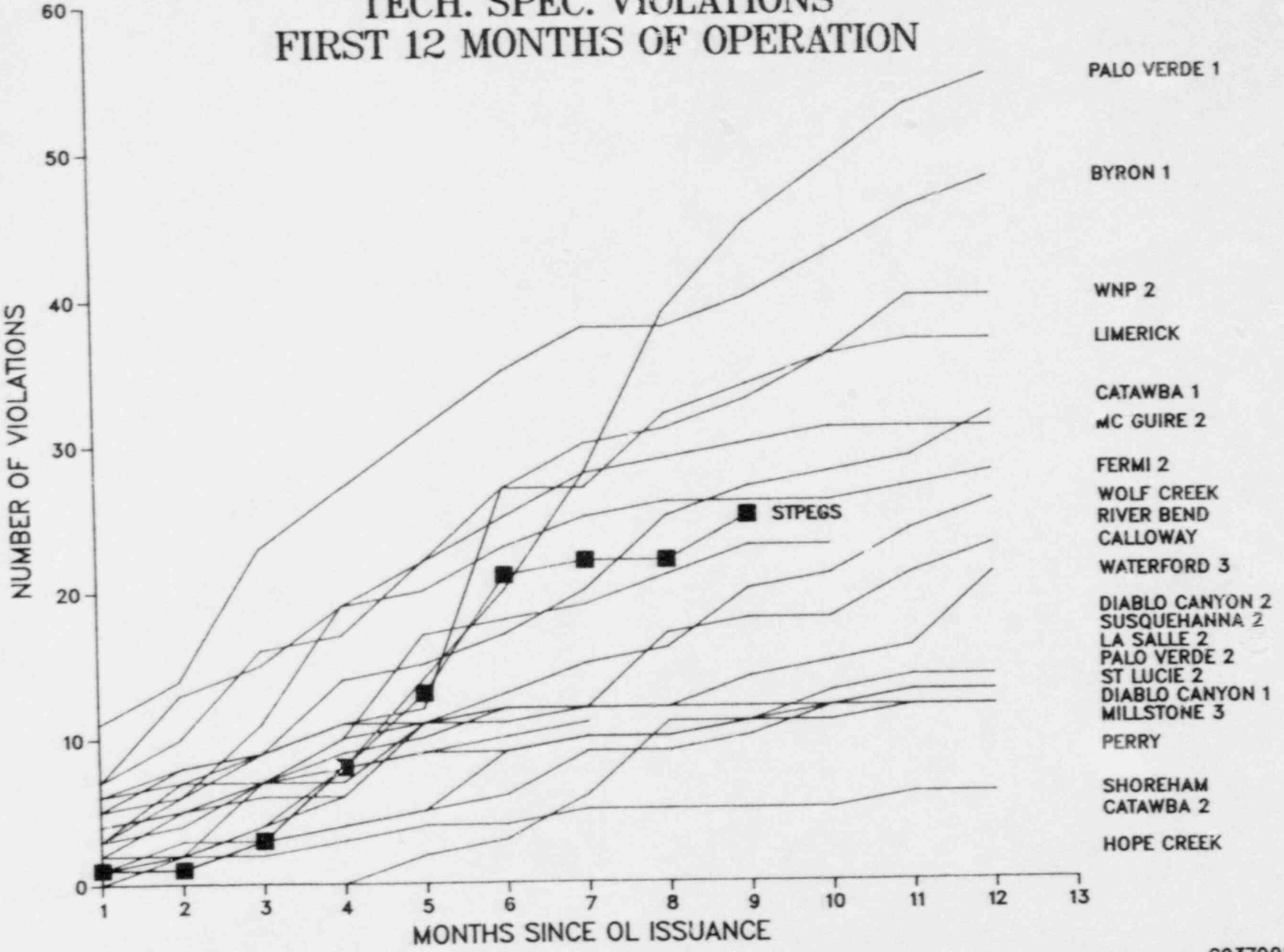
Table 4
Average Rates for Loss of System
Safety Function

Plant	Pre-Commercial Events/Month
Westinghouse	
Byron 1	0.27
Callaway	0.93
Catawba 1	0.69
Diablo Canyon 1	0.28
Diablo Canyon 2	0.18
McGuire 2	0.33
Millstone 3	0.82
South Texas 1	**0.77**
Wolf Creek	0.33
Combustion Engineering	
Palo Verde 1	0.44
St. Lucie 2	0.96
Waterford	0.21
General Electric	-
LaSalle 2	0.58
Limerick 1	0.45
River Bend	0.72
Susquehanna 2	0.45
WNP-2	1.25
Average*	0.57

* Excluding South Texas 1

Note: This counts LERs through 88-030 that were reported pursuant to 10CFR50.73 (a)(2)(vii)

TECH. SPEC. VIOLATIONS
FIRST 12 MONTHS OF OPERATION



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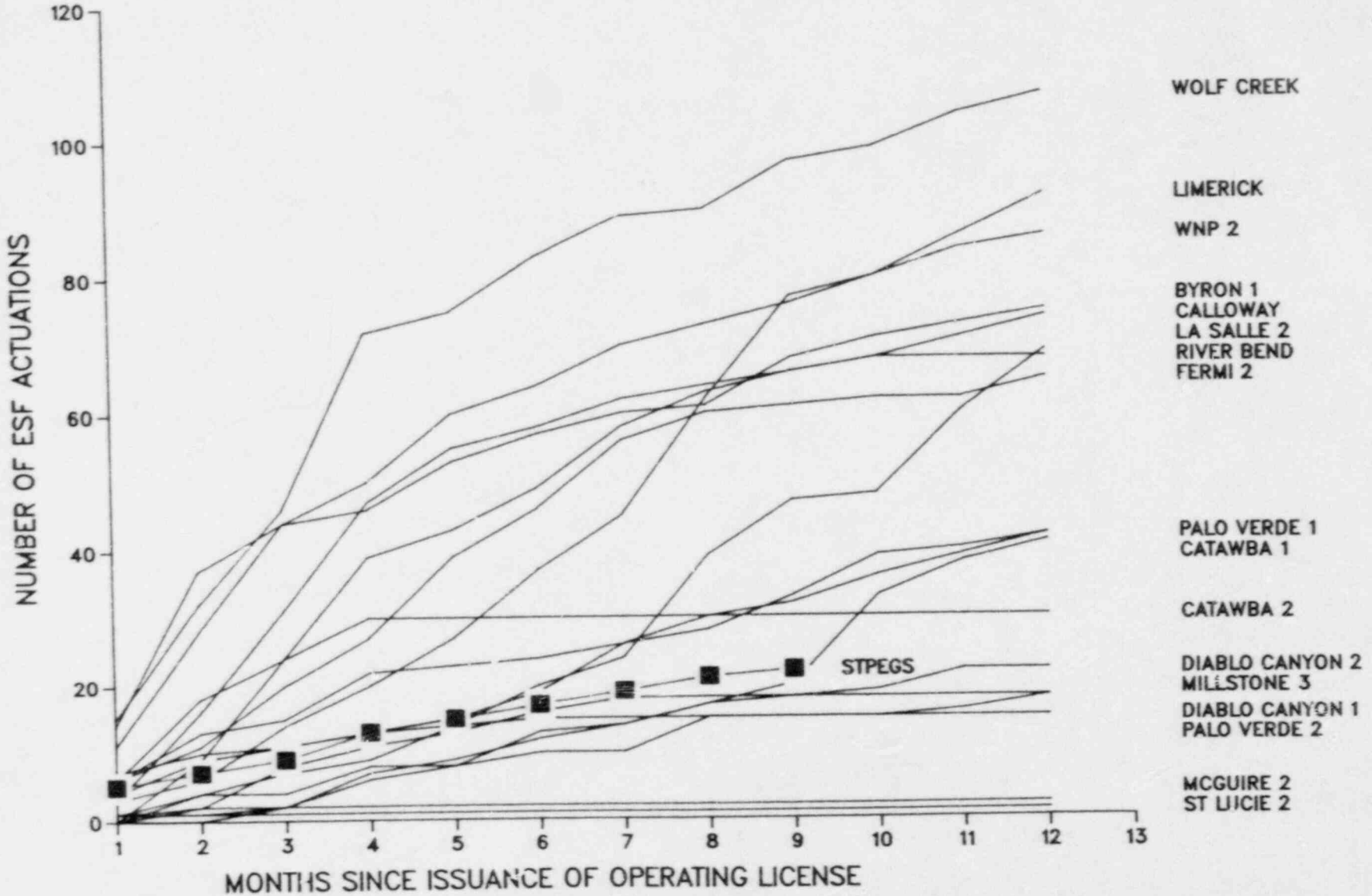
CUMULATIVE ESF ACTUATIONS SINCE ISSUANCE OF OPERATING LICENSE



G937002

EVALUATION OF TESTING

APPENDIX D

SURVEILLANCE AND INITIAL STARTUP TEST PROGRAMS

INTRODUCTION

Plant Engineering has completed an assessment of the Surveillance and Initial Startup test programs. The intent of this assessment was to address overall program adequacy focusing on the period from the Operational Readiness Review (January, 1988) to present. The programs were evaluated by comparison against performance objectives and associated criteria.

To address the specific criteria, the Plant Engineering Department relied on two sources of information; researches of documentation which would have addressed any related deficiencies and field assessments of actual test procedure performances. Areas included in the documentation research included:

Station Problem Reports,
QA Audits and Surveillances,
Procedure Field Change Requests,
NRC Inspection Reports, and
the Surveillance scheduling data base.

Areas of testing included in the field assessments included:

I&C Surveillance Test,
Section XI Surveillance Test,
Electrical Surveillance Test, and
various Initial Startup Tests.

Reports were compiled for each of these research and field assessment tasks. Each of these reports was considered during development of the discussion section of each of the criteria. If the discussion of a specific criteria does not mention a particular research area, it is because no related deficiencies were identified in those areas.

SURVEILLANCE AND INITIAL STARTUP TEST PROGRAMS

1. PERFORMANCE OBJECTIVE - ADMINISTRATIVE PROGRAMS

Administrative programs are effective in implementing the Surveillance and Initial Startup Test Programs.

1.A Sufficient guidance is provided to ensure that Surveillance test procedures are written and performed in a safe, complete and accurate manner.

DISCUSSION

During the period between the Operational Readiness Review and initial criticality six procedural deficiencies were identified which were significant enough to warrant formal documentation/ investigation. Since initial criticality, one potential deficiency was identified when it was determined that a time delay function associated with the sequencing of containment spray was never properly tested. This concern is still under investigation. Additional details concerning test procedures and procedure performance are discussed in sections 2 and 3 of this Appendix. (Ref: SPRs 880013, 880019, 880033, 880040, 880076, 880067, 880181). The task force described in 1.B will also re-evaluate administrative adequacy of the Surveillance program.

ACTIONS

None

SURVEILLANCE AND INITIAL STARTUP TEST PROGRAMS

1.B The Surveillance test scheduling mechanism is adequate to ensure that procedures are performed within the required frequency.

DISCUSSION

Five missed surveillances occurred in the evaluation period. Three have been attributed to improper scheduling methods. These errors involved situations requiring the testing frequency to be doubled. The programmatic methods for handling surveillance tests which require the performance periodicity to be doubled, have been changed to provide more positive procedural guidance for making the scheduling change. The forth, a test package which satisfied several surveillance requirements, was completed approximately eight hours after the required frequency completion date and time. The cause of this event was that several tests were contained within a single test procedure and it was not readily apparent what the most restrictive due date was. Individual test procedures are now being prepared in separate test packages so that required completion dates are readily apparent. (Ref: SPRs 880031, 880091,880120, 880182). The fifth missed surveillance was a conditional test which should have been performed prior to a recent entry into Mode 2. In response to this latest incident, a task force has been established to determine the root cause of this event and re-evaluate overall surveillance program adequacy.

ACTIONS

None

SURVEILLANCE AND INITIAL STARTUP TEST PROGRAMS

1.C The Surveillance testing program results in a high degree of reliability of equipment needed for safe and reliable plant operation.

DISCUSSION

The periodic satisfaction of surveillance test requirements verifies the reliability of that equipment needed for safe and reliable plant operation. Performance of surveillance tests, review of test results, and proper evaluations has successfully resulted in the identification of components/systems which required corrective actions to provide full reliability of the plant safety systems. One of the most significant problems recently identified was the degradation of number 14 turbine driven auxiliary feed pump. During the performance of the routine surveillance test it was noticed that although the pump met the acceptance criteria during the first portion of the test, the performance fell off gradually after an hour or more of operation. The investigation resulted in a complete teardown and rebuild of the pump. (Ref: SPR 880086) Another significant plant problem which was identified as an indirect result of the surveillance testing program was that the resetting of the safeguards test cabinet Master Reset Switch will reset and block safety injection while P-4 is present and the P-11 setpoint is exceeded. Immediate actions have been taken to ensure that safety injection will not be inadvertently blocked and a permanent design change to correct the situation has been approved (Ref: SPR 880092).

ACTIONS

None

SURVEILLANCE AND INITIAL STARTUP TEST PROGRAMS

1.D Sufficient guidance is provided to ensure that Initial Startup test procedures are written and performed in a safe, complete and accurate manner.

DISCUSSION

A recent Quality Assurance audit of the Initial Startup Testing program found a deficiency in Initial Startup Testing program procedure 1PEP4-ZA-01, in that the procedure allowed the use of Test Deficiency Records (TDR) in some cases in which the QA Plan required a procedure revision. Two instances of such improper use of TDRs were identified. The subsequent investigation determined that the use of TDRs in lieu of a procedure revision did not affect the test result. 1PEP4-ZA-01, Initial Startup Test Sequence and Administration, has been changed to remove the option of using a TDR when procedure steps cannot be performed as written. No other significant deficiencies have been identified with respect to the Initial Startup Testing program procedures.

ACTIONS

None

SURVEILLANCE AND INITIAL STARTUP TEST PROGRAMS

1.E Initial Startup testing progress is tracked against a comprehensive schedule.

DISCUSSION

The Initial Startup Testing schedule has been developed and is being followed. The record of performance of the tests with respect to the schedule has been excellent. A good example of this is the low power physics testing sequence which was performed in less than eight days as compared to the scheduled twenty-one days. Overall the schedule has been slowed significantly by plant system or component problems not related to testing.

ACTIONS

None

1.F Initial Startup test results indicate that the plant is operating within design parameters.

DISCUSSION

Testing results to date indicate that the plant generally is performing as designed. The low power physics testing and power ascension testing programs have demonstrated that the fuel, control rods and associated reactor control systems are operating within design parameters. The following operability problems have been encountered:

Steam Generator blowdown sampling system pipes clogging, and

Essential Cooling Water fittings experiencing through-wall porosity at socket joints (Ref: SPR 880108)

The testing process has also resulted in the identification of some operability problems not directly related to the tests, such as:

Main feed pump alignment problems which necessitated the resetting of some hangers,

Main steam system instrument tap plugs missing (Ref: SPR 880118),

Main steam power operated relief valves (PORVs) experiencing operability problems associated with the Paul Munroe actuator and the identification of incorrect seal material (Ref: SPR 880123), and

Moisture Separator-Reheater control system malfunctions.

ACTIONS

None

SURVEILLANCE AND INITIAL STARTUP TEST PROGRAMS

1.G Plant material conditions supports the continued progress through the Initial Startup test program.

DISCUSSION

Plant problems which have recently affected the Initial Startup Testing schedule include steam driven feed pump alignment problems and steam driven feed pump turbine failure.

Main feed pump coupling alignment problems have caused some testing schedule delays. The misalignment resulted in pump bearing high temperatures but an inspection indicated no bearing damage. Cold and hot alignment measurements between the pump and the turbine have required some hanger adjustments and turbine position adjustments. An optical pump alignment check will be performed and bearing temperature monitored at full load conditions to verify proper operation.

One reactor trip has occurred since initial criticality. This trip occurred during the performance of a main generator breaker investigation. Maintenance personnel, during troubleshooting efforts, caused a series of relays to pickup which tripped the switchyard breakers and resulted in a loss of offsite power and subsequent reactor trip/safety injection. (Ref: SPR 880106)

During the recent examination of the reactor bottom mounted instrumentation (BMI) the eddy current results indicated that several thimbles had experienced significant wear. These findings will require additional examinations be performed to verify thimble condition.

A destructive overspeed failure of a turbine driven steam generator feed pump (SGFP) occurred during a loss of off-site power test. The high pressure turbine stop valve did not fully close during the test due to insufficient spring closure force and turbine overspeed resulted in severe damage to the pump and turbine. It has been determined that the high pressure (HP) stop valve failed to close because of inadequate pretension on the closing springs. In addition to proper pretensioning, design changes to provide added assurance against turbine overspeed have been installed. The improvements will be tested to confirm performance prior to ascending to 50% power.

ACTIONS

Continue evaluation of feed pump reliability.

2. PERFORMANCE OBJECTIVE - PROCEDURES

Procedures are complete and adequate to ensure proper performance and compliance with requirements.

2.A Surveillance test procedures contain an adequate level of detail to ensure consistent and proper performance. Precautions, limitations, and restoration criteria are adequate.

DISCUSSION

Between the last Operational Readiness Review and initial criticality, six Station Problem Reports were initiated to document and resolve problems associated with surveillance procedures. In response to these problems definite and prompt corrective actions were completed to correct the problems, review for generic impact, and implement programmatic controls to preclude recurrence. Of these problems, three are discussed in LERs and NRC Notice of Violation 8809-04. During this same period, Nuclear Assurance has performed approximately 30 surveillances of test performance with no Deficiency Reports initiated.

During the period from initial criticality to the present, no significant problems have been identified with surveillance procedures which require formal investigation or documentation. General procedural quality is improving in that the number of surveillance procedure Field Change Requests (FCR) initiated has decreased by almost 50% during this time period. This observation is supported by the field assessments of recent surveillance performances where, while the auditors identified possible improvements, the procedures were found to be adequate with sufficient level of detail.

ACTIONS

None

2.B The Surveillance test procedures require adequate documentation of test performance.

DISCUSSION

During the research performed within the scope of this assessment no instances of improper surveillance documentation were identified. The surveillance procedures reviewed were found to require adequate documentation of the performance of the surveillance and its results.

ACTIONS

None

2.C The Surveillance test procedures include adequate review and approval mechanisms for evaluation of test results

DISCUSSION

The surveillance program requires that test results receive two reviews for acceptability. One SPR was originated prior to initial criticality for an occasion where both the first and second reviewer failed to identify that a test result required corrective action. In response, Plant Operations now requires an additional technical review of test results prior to the Shift Supervisor performing the second review.

ACTIONS

None

2.D Initial Startup test procedures contain an adequate level of detail to ensure consistent and proper performance. Precautions, limitations and restoration criteria are adequate.

DISCUSSION

Nuclear Assurance recently performed an audit of the Initial Startup Test Program. While this audit resulted in three Deficiency Reports, no deficiencies associated with the test procedures were identified. In addition to the audit, approximately 60 surveillances by Nuclear Assurance have been performed since the Operational Readiness Review. This surveillance resulted in one Deficiency Report (DR), which was written prior to initial criticality to point out that data recorded by automatic data acquisition was inconsistent with comparable instrumentation monitored by ERFDADS and a control room chart recorder. Resolution of the DR determined that this inconsistency did not affect test validity.

More recently, a calculation performed within a test procedure was found to be in error. This is discussed further in criteria 2.F of this section.

Field observations, performed as part of this assessment, identified that the level of detail of procedures was such that some individuals required assistance during procedure performance. The procedure author would be consulted to provide a thorough understanding of the intent of the procedure steps.

ACTIONS

The remaining Initial Startup Test procedures should be reviewed to determine if revisions are required to increase the level of detail, or additional training is required for the test directors.

2.E The Initial Startup test procedures require adequate documentation of test performance.

DISCUSSION

During this assessment an example of inadequate test documentation was found and documented on a Station Problem Report (SPR). The SPR was initiated when an Initial Startup test procedure was found to inadequately document operability of Digital Rod Position Indication. Further investigation found DRPI to meet operability requirements while the procedure test package provided insufficient documentation.

During the field observations performed for this assessment, it was identified that intermediate calculation results were typically not recorded. This, combined with inconsistant round off practices, made it difficult to recreate exact calculations. This calculation practice does not compromise the integrity of the test documentation packages. The procedures were found to provide adequate documentation of the test performances.

ACTIONS

Review the Initial Startup test procedures to determine if the calculations performed should include recording of intermediate calculation values and provide calculation round off guidance.

2.F The Initial Startup test procedures include adequate review and approval mechanisms for evaluation of test results.

DISCUSSION

One recent problem report addresses a calculational error discovered by an NRC inspector on an Initial Startup Test data sheet. Reviews of calculations performed since the precritical test sequence were performed and three additional calculation errors were found. Therefore, it is believed that this error is not a generic problem (Ref: SPR 880130). None of the calculation errors discovered impacted the test results.

ACTIONS

None

3. PERFORMANCE OBJECTIVE - TEST PERFORMANCE PRACTICES

Test performance practices comply with safety requirements, and satisfy procedural and documentation requirements.

3.A Verbatim compliance with Surveillance test procedure requirements is practiced.

DISCUSSION

Since the Operational Readiness Review, there have been approximately 30 QA surveillances performed, resulting in no deficiencies concerning compliance with procedural direction.

No deficiencies in this area were observed during the field assessments performed between April 18th and 21st, 1988 on 4 (four) surveillance procedures. Test directors appeared familiar with program requirements for adhering to verbatim compliance. It therefore appears that the surveillance test program is very strong with respect to this criteria.

ACTIONS

None

3.B Coordination between departments is smooth and effective during the performance of Surveillance tests.

DISCUSSION

There have been no notable deficiencies documented in the area of coordination or communication between departments during surveillance performances for the period under consideration. Reports from the field observations show that coordination between the performing sections and operations personnnel was satisfactory. Test results and notice of test completions were communicated in a timely manner.

ACTIONS

None

3.C Post-test reviews of Surveillance tests are completed with adequate attention to detail.

DISCUSSION

In the period between the Operational Readiness Review and Initial Criticality, there were two Station Problem Reports associated with post-test review of surveillance packages. (Ref: SPR 88-0052 and 88-0091) The first incident involved ECW Screen Wash Booster pump test results being in the "Required Action" range with no action initiated. In response to this SPR, an additional technical review of surveillance results has been added and training has been performed.

The second SPR involved an ECW Pump test with results in the "Alert" range. The frequency of the test should have been doubled in accordance with the Unit 1 Pump and Valve Test Plan but the test package was not reviewed by the System Engineer until after the next test should have been performed. As a result, the Pump and Valve program document has been revised to assign specific responsibilities in this area and training of System Engineers performed. A general comment concerning this problem was made during one of the field assessments.

Since initial criticality another SPR involved the untimely identification of surveillance test results which required the doubling of test frequency (Ref: SPR 880182). The trend of a valve stroke time test results required that it be tested more often, but this was not identified until the revised frequency had elapsed. Ths has resulted in the use of one engineer to review the results of those pump and valve tests which could require a similar frequency change.

ACTIONS

None

3.D Surveillance test packages are complete and appropriately filed.

DISCUSSION

For the period following the Operational Readiness Review, there have been no documented problems with surveillance packages in records.

As corrective action results from a previous 1987 QA audit, surveillance test packages in the vault are to be rereviewed for completeness and correctness. This action is scheduled to be completed September 15, 1988.

ACTIONS

None

3.E General observations concerning the surveillance program and test procedures.

DISCUSSION

The following comments are from reports of the field observations and are noted here as recommendations to improve the surveillance test program.

ACTIONS

1PSP03-AF-0007 - Revise step 5.8.1 and 5.9 to clarify marking "NA" if the pump is already in service.
Delete column (Th-T1/T1) on Data Sheet (-3).
Add component drawings labeled to indicate points for taking vibration readings.
Train required operations personnel on proper vibration monitoring techniques.

1PSP06-PK-0006 - Revise section 7.7.1 to add reset of relay after closing knife switch.
Clarify actions necessary to recover from timing run prior to performing repeatability runs in steps 7.7.1.6 and 7.7.2.7.

Evaluate the following recommendations concerning the performance of I&C Surveillances:

Test only one safety train at a time such that only one 7300 cabinet is open at a time. This would avoid confusing Control Room annunciation.

Develop and implement a policy for rounding or truncating readings from digital test equipment to provide consistency between test performers.

Obtain additional support equipment to include equipment carts (to avoid stacking equipment on top of card cages) and additional test leads of various lengths and connector configuration.

Remove the temporary orange tags from the 7300 cards as they are redundant to permanent labeling.

3.F Verbatim compliance with Initial Startup test procedure requirements is practiced.

DISCUSSION

The Initial Startup Test program has been subject to one comprehensive QA audit and approximately 60 QA surveillances. From these, one minor deficiency was noted when a procedure step was initialed and dated indicating two procedures had been completed when only one had been completed. The error was promptly corrected with no further action necessary. Performance of an Initial Startup Test procedure was referenced in a recent Notice of Violation. The concern was that during the performance of a test procedure, the Test Director requested manipulation of the Reactor trip breakers. While the manipulation was required to satisfy plant requirements, it was not a requirement of the test procedure.

ACTIONS

None

3.G Coordination between departments is smooth and effective during the performance of Initial Startup tests.

DISCUSSION

There have been no notable deficiencies with regard to coordination during Initial Startup Testing. Field assessments performed on four procedures between April 18th and the 20th, 1988 reported timely and effective coordination and communication with Plant Operations personnel. QA audit and surveillance results showed no deficiencies that are related to this criteria.

ACTIONS

None

3.H Post-test reviews of Initial Startup tests are complete with adequate attention to detail.

There has been one Station Problem Report (Ref: SPR 88-0130) identifying a calculation error that was missed during the post-test reviews and picked up by an NRC review (refer to the discussion of criteria 2.F). Three other calculation errors have been discovered during the subsequent investigation and none of these errors had an impact on the test results. From the field assessment report, post-test reviews were observed to have been performed satisfactorily and in a timely manner.

ACTIONS

None

SURVEILLANCE AND INITIAL STARTUP TEST PROGRAMS

3.I Initial Startup test packages are complete and appropriately filed.

DISCUSSION

A recent QA audit of the Initial Startup Test Program did not identify any significant problems with the test records.

ACTIONS

None

4. PERFORMANCE OBJECTIVE - PERSONNEL QUALIFICATIONS

Personnel are adequately trained/experienced to ensure safe and proper procedure implementation.

4.A Personnel Qualification program requirements have been implemented for the performance of Surveillance tests.

DISCUSSION

The procedure governing the qualifications required for persons who perform Technical Specification surveillance tests is OPGP03-ZA-0065, Qualification of Plant Staff Personnel. Operations Quality Assurance routine surveillances of testing activities check for proper qualifications of testing personnel. No technical specification surveillance tests observed by Operations Quality Assurance have been performed by individuals who did not possess the knowledge and experience required by the qualification procedure. Operations Quality Assurance has recently completed a comprehensive audit of personnel training and qualifications (Ref Audit 88-21(B)). No deficiency reports were issued concerning the qualification of personnel performing surveillance tests.

ACTIONS

None

4.B The number of errors committed by test performers during the performance of Surveillance tests is indicative of an adequate level of knowledge, experience, and judgement.

DISCUSSION

From review of SPRs, NRC Inspection Reports, QA Audits & Surveillances, and field assessments performed in support of this report, there were no indications of errors by test performers that affected the technical performance of any surveillance tests. The level of detail provided in the procedures and the practice of verbatim compliance have led to a good performance record. The personnel errors that have occurred since the Operational Readiness Review have involved the implementation of administrative requirements of the Surveillance Test Program. These include failure to identify unacceptable test results during the review of a data package, failure to complete a data package review prior to the test's expiration date, and failure to perform required data trending within the necessary time frame. These problems have been documented and evaluated within Station Problem Reports and corrective actions completed to preclude recurrence.

During performance of field assessments, a specific observation was made of an operator's uncertainty in the use of vibration equipment. The operator had to consult someone more experienced to clarify the test requirements prior to performance. This is an example where a test performer is relied upon to perform a task with equipment not typical to their normal job duties.

ACTIONS

Evaluate the Section XI inservice test program to determine if the procedures should provide additional instruction for vibration data acquisition or if the test performers should receive additional training on the subject.

4.C Personnel Qualification program requirements have been implemented for the performance of Initial Startup tests.

DISCUSSION

Personnel who perform initial startup testing activities qualified in accordance with 1PEP04-ZA-0002, Qualification and Certification of Initial Startup Test Personnel. One instance of inadequate documentation of qualification of test personnel has been identified since initial criticality. This occurrence involved a test coordinator whose certification had lapsed. No tests have been performed by individuals who did not possess the qualifications required by the Qualification and Certification procedure.

ACTIONS

None

4.D The number of errors committed by test performers during the performance of Initial Startup tests is indicative of an adequate level of knowledge, experience, and judgment.

DISCUSSION

Personnel errors documented against the Initial Startup Test Program since the last Operational Readiness Review include a QA Deficiency Report when a Test Director incorrectly initialed a procedure step and an SPR when an NRC Inspector identified a calculational error in a test package. It has been verified that these represent isolated cases and do not reflect the general success of the test performers in accurately completing these Initial Startup Tests.

During performance of the field assessments associated with this report, it was observed that the Test Directors commonly consult with the procedure authors to discuss and confirm the intent of procedure steps prior to test performance. While this demonstrated a less than complete understanding of the test procedure, it also demonstrated good judgment to ensure the required level of understanding prior to test performance.

ACTIONS

Refer to the actions listed for criteria 2.D.

EVALUATION OF HEALTH PHYSICS/CHEMISTRY

APPENDIX E

Technical Services Department - 50% Power Assessment Criteria

Performance Objective-Health Physics

The Health Physics Program ensures that plant areas and worker activities are controlled such that applicable Federal Standards and STP Technical Specifications requirements are met.

Criteria

A. Surveys of plant are performed in a timely manner to ensure that changing radiological conditions are recognized and controlled.

Discussion

Radiological surveys are performed in accordance with a predetermined schedule. Areas that are expected to have increased dose rates later in the power ascension program are factored into the schedule to ensure that these increases are tracked in a timely manner.

B. Surveys are performed by qualified individuals who use proper instrumentation and who properly document survey results.

Discussion

Survey and training records reviewed during the evaluation indicate that individuals performing these surveys are properly trained and qualified. Proper instrumentation and documentation was found on the survey records. All survey records are reviewed by Lead Radiation Protection Technicians to ensure that the records are complete and that posting and job controls for the areas surveyed are adequate.

C. A shielding verification program is in place to determine the adequacy of installed plant shielding.

Discussion

A power ascension shield verification program is in place. A full survey was performed at about 2% power and a partial survey was performed at about 30% power. Six penetrations in the secondary shielding that are allowing radiation streaming exceeding the design have been discovered and identified to the Plant Engineering Department (PED) for correction. ISEG and NRC audits of the program have indicated that the program meets all requirements and has been carried out in a professional manner.

D. Radiological areas are posted in accordance with plant procedures. These postings are easily understood by plant personnel.

Discussion

There were very few areas that required any radiological postings found during the evaluation. Those areas that did require radiological postings were properly posted in accordance with plant procedures. Informational posting established for the power ascension program that were no longer needed and that provided conflicting information to workers were removed. While current postings provide information required by Technical Specifications and 10CFR20, additional informational posting will be reviewed for adoption at STPEGS.

E. Access to areas with whole body dose rates >1000 mR/hr are controlled in accordance with Technical Specifications.

Discussion

Procedures are in place to control access to areas of greater than 1000mR/hr as required in Technical Specifications. At present, there are no areas with dose rates exceeding 100 mr/hr outside of the reactor containment building.

F. Access to radiologically controlled areas are properly controlled.

Discussion

Access to radiologically controlled areas is controlled on the 41' elevation of the MAB. Procedures to control access to these areas are in place and are in use. The physical layout of the 41' elevation control point provides acceptable access control, but is not optimal. The computer system used to support access control does not have a back-up computer. The Health Physics Division will review this issue and recommend revisions to the current access control program to improve efficiency and reliability.

G. Radiation Work Permits provide adequate guidance to the workers to ensure that ALARA principles are included in all work performed in radiological areas.

Discussion

Radiation Work Permits in use at the time of this evaluation were reviewed and found to provide adequate radiological controls for the plant conditions. The RWP Program, as described in plant procedures, contains adequate guidance to assure that RWP's generated as radiological conditions progress provide adequate guidance to workers to ensure that ALARA program requirements are met.

h. Radiation Workers are knowledgeable about plant radiological conditions and are following good health physics practices.

Discussion

With current radiological conditions in the plant it is difficult to assess the level of radiation worker knowledge of plant radiological conditions. A survey performed indicated that most workers knew general radiological conditions, but not necessarily radiological conditions in specific plant areas. As conditions change the Health Physics Division will need to continue to assess worker knowledge and to review workers performance in the RRA to ensure that workers are aware of radiological conditions and are using acceptable radiological practices

Performance Objective-Chemistry Analysis

Procedures and equipment are in place to ensure that Technical Specification and plant chemistry parameters can be analyzed and out of specification conditions identified.

Criteria

A. Procedures and equipment are to be operable to analyze plant parameters required by Technical Specifications and Owner's Group guidelines. On-line sampling equipment is predominantly operable.

Discussion

Key chemical parameters requiring analysis in accordance with Technical Specifications and plant procedures are properly analyzed by the Chemistry Division. The on-line sample systems are not providing a sufficient degree of reliability causing Chemistry Technicians to expend many extra hours of work to compensate for these problems. The Chemistry Division will work with plant groups, especially WCC, to ensure this problem receives proper priority to resolve it.

B. Analysis results are provided to plant management and the operating shift to ensure that these personnel are aware of plant chemistry conditions and are taking timely action to maintain chemistry within specification.

Discussion

Daily reports are provided to the operations shift and to plant management. While no Technical Specification parameters have been exceeded corrective action has been taken in a timely manner for other chemistry parameters that are out of specification. A few Non-Technical Specification parameters have been out of specification for extended periods because of system design or maintenance problems. These items are reviewed periodically and appropriate priority generally has been assigned to correcting them.

Performance Objective-Chemistry Operations

Plant chemistry parameters controlled by the Chemistry Operations group are maintained within specification and any out of specification conditions are corrected in a timely manner. The radioactive waste system is ready to support the processing of radioactive waste produced by plant operations.

Criteria

A. Equipment and procedures are in place to adequately control Plant Chemistry Parameters within applicable requirements.

Discussion

Equipment and procedures are in place to ensure that plant chemistry parameters can be controlled within specification. Long term problems have been found in maintaining condensate system dissolved oxygen and conductivity, RMWST dissolved oxygen and secondary system TOC within specification. These issues are being addressed with PED. The material condition of the non-radioactive waste system is poor and corrective action needs to be developed to address this issue. The Oily Waste System appears to be overloaded and a program is being developed to reduce inputs into the system. A few other chemistry systems will need further attention in the future. However, these systems should support power operations at higher levels.

B. Corrective actions are undertaken in a timely manner to place plant system back into specification when chemistry transients occur.

Discussion

Corrective action has generally been undertaken in a timely manner to correct out of specification conditions. The Chemistry Division is taking a more active and aggressive role in ensuring that their issues are given proper priority to the work planning process.

C. The radioactive waste system is ready to support the processing of radioactive waste in accordance with plant Technical Specifications.

Discussion

The radioactive waste system is ready to process radioactive waste expected to be produced by plant operations. The evaporators are not yet in service since they are not presently needed. The Chemistry Division is reviewing possible changes to resins used on the system to allow a change of operating philosophy to avoid the use of evaporators. Most other PWR's have adopted a similar philosophy to reduce the generation of radioactive waste.

D. Inputs to the radioactive waste are identified and controlled to limit the volume of radioactive waste produced.

Discussion

Detailed walk downs of plant systems have been performed by Chemistry to identify inputs to the radwaste system. To date inputs to the systems have been relatively low and are decreasing.

E. Technical Specification requirements for the release of radioactive effluents are met.

Discussion

A review of recent effluent release packages indicates that releases from the plant are being properly controlled in accordance with applicable requirements.

F. The generation of dry active waste is controlled to prevent the unnecessary generation of radioactive waste.

Discussion

To date less than one cubic meter of dry active waste has been produced. Programs such as minimizing contaminated areas, the radwaste minimization control point and the roving radwaste watch have helped reduce the generation of radioactive waste. As a final measure all waste collected in the RRA is segregated to separate contaminated and uncontaminated waste to reduce volume. While the present method of segregating waste is technically adequate it is very labor intensive. The Chemistry Division is evaluating alternate methods.

G. Procedures and equipment are in place to package and ship radioactive material and waste.

Discussion

Procedures are in place to package and ship radioactive materials and waste. A contract is in place with one burial site to dispose of radioactive waste. Contracts with the other two burial grounds are in the approval cycle. The current radwaste compactor is an older design that will not produce compaction ratios achieved by current designs. The Chemistry Division is exploring alternative options to provide increased compaction.

EVALUATION OF SECURITY

APPENDIX F

NUCLEAR SECURITY 50% POWER SELF ASSESSMENT

ASSESSMENT CRITERIA

1. PERFORMANCE OBJECTIVE

The Intrusion Detection System (IDS) is adequate and in compliance with regulatory requirements.

CRITERIA

A. Improvements identified in the E-field study were implemented.
   -The results of the E-field performance study were considered in the redesign of the Unit 1 E-field. This included the incorporation of later model controllers and support hardware, steel poles, and a 4-wire balanced system. The reconstruction of the Unit 1 E-field was completed on April 15, 1988 on schedule.

B. The Intrusion Detection System averages 90% or greater availability.
   -From April 1, 1988 to May 15, 1988, the IDS for Unit 1 averaged 97.42% availability.

C. The Intrusion Detection System meets Reg. Guide 5.44 FAR/NAR criteria.
   -The IDS does not yet meet FAR/NAR criteria. The system continues to be monitored and improvements made as appropriate. Improved IDS performance is a commitment which continues to be evaluated for the year following issuance of the full power license.

D. The CCTV system adequately meets regulatory requirements without additional compensatory measures.
   -The CCTV system had been found to be unacceptable by the NRC. As a result, 3 additional compensatory posts were placed to enhance perimeter alarm assessment. The CCTV system has now been reworked to include additional cameras, camera repositioning, and perimeter fence straightening. The CCTV system was found acceptable by an NRC Security Inspector in February, 1988 and the added compensatory patrols were discontinued. The system continues to meet requirements.

2. PERFORMANCE OBJECTIVE

The Training and Qualification (T&Q) Program provides a trained security guard force meeting regulatory requirements.

NUCLEAR SECURITY 50% POWER SELF ASSESSMENT

CRITERIA

A. The Training and Qualification Program (T&QP) is acceptable.

-The Nuclear Training Department revised the T&QP based upon a Systematic Approach to Training concept. This included development and completion of job and task analyses, terminal and enabling objectives, lesson plans and evaluation instruments. This training program significantly altered the training effort.

B. The schedule for retraining existing officers, and the training of new officers, was implemented and commitments met to date.

-An extensive retraining program, using the newly reformatted T&QP, was implemented in the fall of 1987. Security officers who had previously completed training were scheduled for retraining and classes were scheduled for new security officers. To date, commitments regarding training and retraining have been met. One commitment, Alarm Station Training, remains scheduled as part of the training program. It is anticipated that all training will be completed as scheduled.

C. Drills are conducted to adequately test security force capabilities.

-A revised drill program was initiated and drill scenarios were rewritten. Currently 11 drill scenarios are available for random implementation by the security force. Drills are critiqued immediately after conclusion and comments are reviewed and evaluated by the training staff for improvements or retraining, as appropriate.

-A drill was conducted during this evaluation. Observers reported good response and communications between responding personnel, response leaders and the alarm stations. The drill scenario was realistic and the drill was completed successfully. One security officer was observed not using proper cover and concealment and was instructed in the proper techniques following the drill.

3. PERFORMANCE OBJECTIVE

The design basis threat will be adequately met in accordance with regulatory requirements.

CRITERIA

A. Security force response to alarms and compensatory posting is within the parameters established.
   -Recent improvements to our CCTV system have increased our ability to assess alarms without the response of security personnel. Other modifications to the perimeter IDS have greatly reduced the false alarm rate.

   These changes allowed us to eliminate 3 augmentation patrols and provide additional time for the responding officer to perform an accurate assessment. Average response time to vital and perimeter alarms, and the average response time for compensatory postings are within the parameters established.

B. Plans and procedures provide appropriate direction and are effective.
   -The physical protection system at STPEGS is designed in accordance with regulatory requirements. Internal and external audits have shown that our system meets the criteria of a design basis threat. In response to recommendations from both the NRC and the Nuclear Assurance Department, the plans and procedures are currently undergoing revision to combine, clarify and simplify their direction. The final goal is a streamlined and efficient procedural program that continues to reflect applicable site and regulatory requirements.

4. PERFORMANCE OBJECTIVE

The Security Force will be adequately staffed to satisfy program requirements.

CRITERIA

A. Security Force attrition will be maintained within a rate that assures continuity of experience.
   -The security force attrition rate for the first quarter of 1988 was 3%. This is a substantially lower attrition rate than seen in 1987 and it provides for more experienced officers on shift.

B. Decrease the average hours worked per week of security officers and provide regular days off.
   -During the period following 5% power and implementation of the security training program, security offi-

cers were working extensive (51%) overtime hours and had infrequent days off. With the completion of the retrofit training classes, and enhanced by the low attrition rate, the security force has recently changed its work schedule. Officers are now working a schedule of 4 - 12hour days followed by 4 days off.(This provides for a pay period of 48 and 36 hour work weeks.) Overtime is currently voluntary and is averaging 25%.

5. PERFORMANCE OBJECTIVE

Security procedures provide appropriate direction and plant personnel are aware of their responsibilities to support zero reportable or loggable access control events.

CRITERIA

A. Reduction in the number of reportable and loggable access control events.

-During the first quarter of 1988 and to date, there were no reportable events involving access control. There were, however, several events which were loggable. The majority of these events were primarily in the area of badge control. Various solutions to identified problems are being studied and appropriate measures are being taken to ensure compliance with requirements.

-During this evaluation a surveillance was conducted of badge issuance activities in each of the gatehouses. During the surveillances no violations of badge issue procedures were observed and Security Officers conducted themselves in a professional manner.

6. PERFORMANCE OBJECTIVE

Provide for program enhancement through self assessment.

CRITERIA

A. Implement an Internal Assessment Program to review the security program.

-In January, the Department began a more thorough internal assessment program designed to be proactive rather than reactive in order to discover security deficiencies. Three full-time personnel are assigned

to the Internal Assessment Program. The program is designed so that security systems, equipment, procedures, and records are reviewed to ensure compliance with applicable federal requirements and license commitments. The assessments include the use of checklists, developed from applicable documents, to ensure depth and continuity of the assessment.

Assessments will be directed at various programmatic areas throughout the year. To date, 7 assessments have been completed and six of those have had reports issued. The reports include both findings of compliance and/or matters of concern. The internal assessment program will provide valuable information on problematic areas, allowing timely correction in a proactive manner.