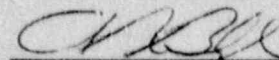


U. S. NUCLEAR REGULATORY COMMISSION
Region I

Docket No.: 50-317
Report No.: 50-317/89-81
Licensee: Baltimore Gas and Electric Company
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Baltimore, Maryland 21203
Facility: Calvert Cliffs Nuclear Power Plant, Unit 1
Inspection at: Lusby, Maryland
Inspection Conducted: November 7-20, 1989
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A. Acronyms

1.0 EXECUTIVE SUMMARY

A Readiness Assessment Team Inspection (RATI) was conducted to determine whether licensee corrective actions had been effective at generally raising the level of performance in the areas targeted for improvement by Confirmatory Action Letter (CAL) 89-08 and related documents and whether performance was currently at a level that would provide assurance of safety in support of plant operation. In order to appropriately cover the areas of interest, the Team was organized into three inspection groups: operations, maintenance/surveillance, and safety assessment and quality verification. The groups were led by NRC Senior Resident Inspectors (SRIs) all from different Region I sites. Particular emphasis was placed on evaluating the effectiveness of recent program changes and on determining the level of licensee staff understanding of the changes. A representative of the State of Maryland observed the inspection.

In the areas of Maintenance and Surveillance, the Team found that the level of performance had been raised and would support safe plant operation of the plant.

In the area of Safety Assessment and Quality Verification, the Team found that performance for the most part had been raised and would support safe plant operation. However, many programs were in transition and management initiative was being relied upon to compensate for formal process weaknesses. For example, the generally successful identification of issues necessary to be resolved before restart primarily had been the result of the licensee's major site-wide communications effort to encourage staff to bring issues forward. Whereas the Team developed a general confidence through checking a sampling of issues that restart issues had been properly identified, the Team was concerned regarding the processes for tracking and resolution of routine corrective actions. These concerns were based on the multiplicity of systems, the size of the backlogs, and inconsistencies in methods for prioritization, tracking and management review. Since the restart list is a specialized mechanism and these other multiple systems will be relied upon for corrective action management after restart, the Team considered it important that the licensee provide additional measures of assurance that deficiencies identified during operation would be properly classified, prioritized, reviewed and tracked to assure effective corrective actions on appropriate schedules. The licensee made an acceptable commitment to address this concern.

In the area of operations, the inspection covered three main areas:

1. procedure usage;
2. control of plant status and activities; and,
3. safety tagging and equipment control.

The Team found general improvement in the use of procedures and administration of change processes. During the course of this review, the Team found examples of inadequate procedures for the current plant mode. These are being corrected by the licensee. The issue of adequacy of procedures for other operational modes is being addressed outside the scope of this inspection.

The Team also found a satisfactory level of control of plant status and adequate shift knowledge of plant status and activities.

In the area of safety tagging and equipment control, the Team found that the licensee was not ready for an NRC inspection. Although tagouts were being properly researched, devised, approved and installed, the licensee lacked a meticulous approach to administration of the program. Further, there was a lack of sensitivity to the need for application of formal corrective action processes to deficiencies found in tagging program implementation. Finally, management review of improvements and ongoing overview of this area had not been sufficient to identify that this area was not ready for the NRC RATI review. Because of the weaknesses identified, the Team concluded that improvements would be necessary to assure that a satisfactory level of performance can be sustained to support safe operation of the facility.

The licensee is expected to re-evaluate this area and to provide a comprehensive written response.

The Team made the following general observations:

- There was a markedly increased awareness of the importance of, and requirements for, adherence to procedures.
- The organization appeared to have become more sensitive to problem identification.
- The mechanisms used to communicate current management goals, policies and objectives were effective in making all levels of the plant staff aware of these expectations.
- The organization appeared weak in communicating with the NRC.

The results of this inspection and related followup activities will be considered, along with below listed items, by NRC during deliberations regarding plant restart:

- (1) results of NRC inspection activities to review individual open items needed to be resolved before restart;
- (2) results of BG&E efforts to achieve, and to internally verify, plant physical readiness for operation; and,
- (3) results of NRC evaluation of BG&E corrective actions relative to:

(i) equipment and procedures for shutdown from outside the control room; and,

(ii) assurance of adequacy of normal operating procedures.

These items were known by NRC and BG&E to be pending when the inspection was scheduled.

2.0 INTRODUCTION

2.1 Background

Baltimore Gas and Electric (BG&E or the licensee) has an ongoing Performance Improvement Plan (PIP), a long-term plan designed to raise the safety performance at their Calvert Cliffs Nuclear Power Plant (CCNPP, the plant, the station, or the site). In addition, on May 23, 1989, BG&E indicated in a letter to the NRC, that it intended to keep both Calvert Cliffs units shut down while it took action to address certain hardware and programmatic issues.

The hardware problem involved leakage from the Unit 2 pressurizer via heater element welds. The programmatic issues involved procedural adherence, work controls, and system status controls. These commitments, along with BG&E's intent not to restart Unit 1 without obtaining the NRC Regional Administrator's agreement, were formalized in NRC Confirmatory Action Letter (CAL) 89-08 on May 25, 1989.

Subsequently, NRC issued a report of a Special Team Inspection (STI) 50-317/89-80 and 50-318/89-80 conducted in February and March 1989. In its June 21, 1989 letter, BG&E also committed to address certain issues from this STI prior to restart.

In an October 27, 1989 letter to NRC and at a meeting in NRC Region I on November 1, 1989, BG&E described the specific corrective actions taken to resolve the programmatic actions associated with the CAL and the STI report. The hardware issue had been previously resolved for Unit 1.

NRC review of BG&E's programmatic corrective actions includes a detailed technical review of each of over 40 specific issues which is being managed by the NRC Resident Inspector office and an overall assessment of licensee performance which was the function of this team inspection.

Although important to NRC deliberations regarding restart, the results of this inspection would not solely lead to NRC Region I concurrence with restart of either unit. NRC Region I management expects to review the results of this inspection along with the following:

- (1) the results of inspection activities, still ongoing, to review individual open items needed to be resolved before restart. These include the detailed review of individual CAL/STI closeout packages; this review is still ongoing, as coordinated by the NRC resident staff;

- (2) the results of BG&E efforts to make the plant physically ready for startup and to verify completion of those items internally evaluated by BG&E as restart items; and,
- (3) NRC evaluation of BG&E corrective actions relative to:
 - (a) equipment and procedures for plant shutdown from outside the control room (commonly referred to as AOP-9 issues); and,
 - (b) assurance of adequacy of normal operating procedures.

These items were known by BG&E and NRC to be incomplete when the inspection was scheduled.

2.2 Purpose and Scope of Inspection

This RATI is part of the NRC staff process for determining restart readiness. Its specific purpose was to determine whether corrective actions have been effective at generally raising the level of performance in the areas targeted for improvement by the CAL and related documents and whether performance is now at a level that would provide assurance of safety in support of plant operations.

The Team was designed to look very broadly at results and to assess the level of performance in the areas of previous concern. The Team was not designed to look deeply and in detail at individual issue closeout packages prepared by BG&E. Detailed review of individual items is being coordinated by the resident staff during normal NRC inspections.

2.3 Methodology

In order to appropriately cover the areas of interest, the Team was organized into three inspection groups corresponding to the following functional areas:

- Operations;
- Maintenance/Surveillance; and,
- Safety Assessment and Quality Verification.

The inspection consisted of interviews with licensee personnel, plant tours, observations of plant activities, and selective examinations of procedures, records, and documents. Particular emphasis was placed on evaluating the effectiveness of recent program changes and on determining the level of licensee staff understanding of the changes.

An important feature of the Team was the extensive interaction among the Team members to arrive at a collective, supportable assessment of the level of performance and of areas of strength and weakness.

The inspection focused on Unit 1 programs and activities, since the licensee's plans are to restart Unit 1 substantially in advance of Unit 2. However, the Team noted that licensee programmatic controls are essentially identical for both units. (An exception is the use of laminated drawings to display tagout boundaries as discussed in Paragraph 4.1.) Also, inspectors toured Unit 2 and observed Unit 2 conditions in cases where these observations could help provide an assessment of licensee programs common to both units.

3.0 SUMMARY OF RESULTS

This section of the report provides a summary of significant inspection findings in each area. Within each area, the Team identified specific strengths, substantial improvements, and weaknesses. These are summarized below. Additionally, significant observations of the Team are listed. These observations may reflect positive or negative program and performance attributes, but are not sufficiently noteworthy to be characterized as strengths, substantial improvements, or weaknesses. For each functional area, more detailed findings are provided in paragraph 4.

Paragraph 3.4 describes Team findings, that are applicable to all functional areas. Because of their broad applicability, these findings should be of special interest to senior licensee management. These findings are not repeated in paragraph 4.

Paragraph 3.5 summarizes formal licensee commitments made to the NRC Team during the inspection.

3.1 Operations

The operations results are summarized for each of the following areas: safety tagging and equipment control, use and control of procedures, and control of plant status and activities.

3.1.1 Safety Tagging and Equipment Control

Substantial Improvements - The following substantial improvements were noted:

- (1) additional licensed operator review of safety tagouts to increase confidence in tagout adequacy;
- (2) strengthened programmatic requirements as described in the procedure for safety tagging;
- (3) use of color coding to better identify tagouts by unit and area;
- (4) use of an equipment status board in the tagging office;
- (5) tagging representation in planning/scheduling meetings and shift turnover briefings; and,
- (6) elevation of the tag supervisor position to a shift supervisor level.

Weaknesses - Three major weaknesses were noted:

- (1) the tagout system is not being meticulously administered and implemented;
- (2) the tagout system is not receiving sufficient performance monitoring and management oversight; and,
- (3) tagout system implementation deficiencies do not always receive adequate documentation, and are not always entered into the appropriate formal corrective action systems.

The following are examples of the above weaknesses:

- (1) the required 30-day audits of tagouts greater than 90 days old were not completed for September and October 1989; licensee management was unaware of the missed audits and no formal corrective action had been initiated;
- (2) identification, documentation and management reviews of audit discrepancies were informal and often not fully followed up;
- (3) NRC identified a red danger tag attached to Unit 1 temporary refuel water level panel that had been moved from another panel without proper documentation;
- (4) recent tagout violations were followed up informally; responsible personnel were uncertain as to which formal corrective action processes were appropriate;
- (5) in a November 12, 1989 audit conducted by the licensee in response to the identification of missed audits, two electrical breakers were found with tags removed and breakers repositioned. Although corrective actions were initiated immediately, there was a 3-day delay in initiating an NCR; and,
- (6) Use of laminated drawings to display tagout boundaries was found to be cumbersome, inefficient and only marginally useful. Of four sets of drawings checked by NRC, each set contained errors or inconsistencies. The licensee is considering discontinuing this aspect of its program due to its marginal usefulness.

Observations

- (1) Staffing levels in the tagging area appear questionable to support the outage workload.
- (2) The licensee has recognized, and is addressing, a need for additional electrical and I&C expertise in the tagging group.

3.1.2 Control and Use of Procedures

Substantial Improvements

- (1) There is increased awareness of the importance of procedure use.
- (2) There is increased attention to evaluating procedure changes for change of intent.
- (3) The licensee has improved the process for implementing minor (i.e., pen and ink) procedure changes.
- (4) Operators are stopping work activities when appropriate to resolve procedure problems.

Weaknesses

- (1) Several examples of inadequate procedures for the current plant mode were noted. These involve operation and verification of the boration flow path for the existing plant condition. These examples reinforce the need for procedure verification and upgrades. Adequacy of procedures for the operational modes will be evaluated by NRC outside the scope of this inspection.
- (2) GS-NO Standing Instruction which provide operating instruction that could affect nuclear safety were not deleted when replaced by approved procedures as committed by the licensee. Although the specific cases were corrected during the inspection, the continued existence of this concern implies that current licensee corrective action may not be effective at preventing recurrence of this program weakness.

Observation

The individual sections of Operating Instructions are not organized in a well-thought out order.

3.1.3 Control of Plant Status and ActivitiesSubstantial Improvements

- (1) Shift briefings are effective at transferring information.
- (2) Effective steps have been taken to increase plant status information to operators, including equipment status sheets, daily tagout listings, and planning and scheduling group representation at shift briefings.
- (3) There is expanded use of out-of-service (OOS) tags to display equipment status to operators.
- (4) Safety review of temporary modifications (TMs) under procedure CCI-117 has been strengthened.

Weakness

For TMs implemented outside procedure CCI-117, such as those under Engineering Test Procedures, there is no formal screening of status and acceptability prior to mode change.

Observation

There is an unusually extensive use of temporary notes and other operator information aids on control panels. If not reduced prior to restart, the sheer volume of this information could present a human factors concern. However, based on a detailed review of those items by the Team, it appeared that those notes could be largely removed before startup.

3.2 Maintenance/SurveillanceStrength

The maintenance job supervisory observation program is a strength. Supervisors are making meaningful observations and critical comments.

Substantial Improvements

- (1) The administrative procedure for control of Maintenance (CCI-200) is a good procedure that should provide strong control over maintenance. This includes improved planning, more detailed packages, better post-maintenance testing and improved documentation of completed work.
- (2) Controls and accountability for surveillance scheduling have been improved; in the areas assigned, functional test coordinators assure proper scheduling.

Weakness

The decision to exclude certain surveillances from program consolidation under the STP managers was not fully thought out. For example, Technical Specification required surveillances outside the consolidated program did not have a completion certification signature required on mode change checklists (OP-6). (See paragraph 3.5.2 for licensee corrective action commitments).

Observations

- (1) The scheduling function is developing rapidly.
- (2) Control of vendor technical information is now adequate.
- (3) The licensee is still working out implementation and coordination difficulties with respect to the new maintenance controls. This results primarily in efficiency problems. Although this is not a safety concern to NRC, the NRC could become concerned during power operations, if equipment important to plant safety undergoes unnecessarily long out-of-service times due to unreasonable delays in starting or coordinating work.
- (4) The Team noted that licensee controls over MOV torque switches are behind industry general practice. (See paragraph 4.2.3.2).
- (5) The Team questioned the reportability of shutdown cooling heat exchangers flow information identified by BG&E in June 1988. (See paragraph 4.2.3.2).

3.3 Safety Assessment and Quality Verification (SA/QV)

Substantial Improvements

The following long-term programs have been substantially improved and, if implemented effectively, have the potential for significant safety benefits:

- (1) Procedures Upgrade Program;
- (2) Supervisory Training Program; and,
- (3) System Engineer Program.

Weaknesses

- (1) The Team identified weaknesses in the structure and relationship to line management of the Plant Operations Safety Review Committee (POSRC):
 - (a) Authority to approve POSRC recommendations was delegated by the Plant Manager to three alternate POSRC Chairman. This indicates a lack of full appreciation of the POSRC function of advising the Plant Manager in that the Plant Manager's review function would not be fulfilled;
 - (b) The GS-QA was delegated both authority as POSRC Alternate Chairman and, more importantly, Plant Manager signature authority, without provisions to remove him from concurrent QA duties. While the individual is well-qualified for the functions, the assignment represents an undesirable cross-connect between the operating and QA organizations; and,
 - (c) The Team was concerned that the licensee's occasional practice of accepting a POSRC quorum which included an Alternate Chairman along with two alternate members may impair the effectiveness of POSRC reviews.

The licensee has taken immediate actions to correct the specific deficiencies; however, continued monitoring is appropriate to ensure the underlying root causes for these deficiencies are defined and understood.

- (2) There is a large number of POSRC open items, many of which are overdue. (See paragraph 3.5.7 for licensee's commitments.)
- (3) The Licensing Department's review of reportability determinations under procedure CCI-118 is ineffective in its collateral function of assessing if an NCR should also be initiated to ensure appropriate corrective action. The Licensing Manager has provided instructions to his staff to address this issue. Also, he committed to revise procedure CCI-118 to clarify this area by February 15, 1990. (See paragraph 3.5.8 for licensee commitments.)

A generic weakness regarding corrective action processes is discussed in paragraph 3.4.

Observations

- (1) The licensee has several recent positive quality initiatives:
 - (a) Quality circles for Quality Control personnel;
 - (b) Independent Safety Evaluation Unit (ISEU) activities; and,
 - (c) Human Performance Evaluation System (HPES) evaluations.
- (2) The licensee was generally successful in identifying and tracking restart items.
- (3) The Offsite Safety Review Committee (OSSRC) displayed good safety perspective during the one meeting observed by the Team.
- (4) The Team noted a generally better sensitivity throughout much of the organization to problem identification through the NCR process.
- (5) Regarding change of intent with regard to procedure changes, the Team noted some confusion with the definition but decisions are being made conservatively.
- (6) The Team noted that QA findings were not being subjected to a formal review as to restart applicability. (See paragraph 3.5.9 for licensee commitments.)

3.4 Generic Findings

The following paragraphs summarize generic insights derived by the Team. Through intensive interaction among the Team members, as is characteristic of this type of inspection, the Team made several observations and noted two weaknesses that applied to all functional areas.

Because these items are derived from inspection in all functional areas rather than specific discrete inspection findings, in most cases they are not further amplified in paragraph 4.

Observation

The Team made three generic observations, all of which reflect somewhat positively on licensee improvement efforts.

- (1) There is increased awareness throughout the station of the importance of, and requirements for, adherence to procedural requirements.

- (2) The organization has become more sensitive to, and conscientious in, problem identification.
- (3) The mechanisms used to communicate current management goals, policies and objectives were effective in making all levels of the plant staff aware of these expectations. Because these mechanisms included extraordinary measures by senior management, such as numerous presentations by senior managers to all organizational levels, the successful communication in this case was not necessarily a reflection on the adequacy of routine vertical communications in the organization.

Weaknesses

- (1) The Team classified as a generic weakness, the licensee's processes for tracking and resolution of routine corrective actions. These concerns were based on the multiplicity of systems, the size of the backlogs, and inconsistencies in methods for prioritization, tracking and management review. Since the restart list is a specialized mechanism and these other systems will be relied upon for corrective action management after restart, the Team considered it important that the licensee provide additional measures of assurance that deficiencies identified during operation will be properly classified, prioritized, reviewed and tracked to assure effective corrective actions are completed on appropriate schedules.

The licensee committed to implement before restart measures to provide additional assurance that deficiencies identified will be properly screened, classified and prioritized for corrective action. (See paragraph 3.5.1 and 4.3.)

- (2) The Team noted several indicators of licensee weaknesses in communicating with the NRC and in recognizing items of interest to the NRC.

Some positive licensee actions were not properly conveyed to NRC. An example of this is the series of line manager presentations to senior BG&E manager regarding the CAL/STI related improvement actions. Insofar as these were part of a management self-assessment process, these were of interest to the NRC.

Other indicators of weak communications with NRC were noted:

- (a) The licensee failed to adequately convey to NRC the availability of licensee managers during the RATI. One of the major reasons for NRC to announce major inspections is to allow the licensee to ensure availability of key personnel and convey exceptions to the NRC.

- (b) The licensee did not appear to expect the broad nature of this RATI. Further, the licensee requested the inspection at a time when little "run-time" had been experienced on new programs and initial implementation difficulties were still being worked out. Examples are the new maintenance process and procedure "changes of intent" definition. The licensee could have achieved a better understanding of the inspection methodology and criteria had it attempted to do so.
- (c) The Team sensed an excessive reluctance by BG&E staff to consider modifying any commitments. The NRC expects licensee's to place emphasis on meeting commitments. However, if one proves unworkable or if a substantially safer approach is identified, NRC also expects that licensees would provide a timely, well-documented, well-supported change to the commitment.

These indicators should be reviewed by licensee management in order to assist them in improving regulatory interfaces.

3.5 Summary of Licensee Commitments

This section summarizes licensee commitments made during the inspection.

- 3.5.1 The licensee will implement before restart measures to provide additional assurance that deficiencies identified will be properly screened, classified and prioritized for corrective action. (Detail 3.4 and 4.3.3.2)
- 3.5.2 Before startup, BG&E will incorporate into mode change checklists of procedure OP-6 completion certification signatures for surveillances in area outside the program consolidated under the STP coordinator. (Detail 4.3.3.2)
- 3.5.3 BG&E will evaluate during 1990 the appropriateness of continued exclusion of portion of the surveillance program from consolidated program management under the STP coordinator. This is not a restart item. (Detail 3.2 and 4.2.3.2)
- 3.5.4 Before restart, the licensee will screen through POSRC, the results of the first phase of their contractor review of the correlation between surveillance procedures and Technical Specification surveillance requirements. (Detail 4.2.3.2)

- 3.5.5 The licensee agreed to correct weaknesses identified in procedures for the current plant mode as follows (Detail 3.1.2 and 4.1.2):
- (1) Provide an approved procedure for boration flow path using HPSI by December 1, 1989.
 - (2) Clarify acceptance criteria of procedure STP-0-62-1 for boration flow path valve position surveillances by December 31, 1989.
- 3.5.6 Prior to restart, the licensee will implement a method to screen for mode change applicability those temporary modifications controlled outside procedure CCI-117. (Detail 3.1.3 and 4.1.3)
- 3.5.7 Regarding POSRC open items, before restart the licensee will add a signature in prestartup checklists to certify that the POSRC open item status is acceptable for startup. (Detail 3.3 and 4.3.3.2)
- 3.5.8 The licensee will revise by February 15, 1990, procedure CCI-118 to clarify Licensing Department review responsibilities, especially as they apply to determining if an NCR should be generated. (Detail 3.3 and 4.3.3.2)
- 3.5.9 Before the next startup, the licensee will review open QA findings for restart applicability. (Detail 3.3 and 4.3.3.2)

3.6 Other Open Items for Restart

This area lists open restart issues arising from the inspection that are not covered in Detail 3.5 above.

- 3.6.1 Administration of the tagout program (see Cover Letter and Detail 4.1).
- 3.6.2 Licensee resolution of Shutdown Cooling (SDC) heat exchanger flow/vibration issues (Detail 4.2.3.2).

4.0 DETAILS OF INSPECTION

4.1 Operations

The inspection of plant operations reviewed three broad areas. These were: control of plant status, control of work activities, and control of procedures and changes. Inspectors interviewed site personnel, observed activities in progress, reviewed documentation of activities, and verified the fulfillment of procedure requirements. Assessments were made addressing the effectiveness of site safety tagging, the use of plant administrative and operational procedures, and the effectiveness of the control of plant status and activities.

The following paragraphs provide a summary of the details of the Team's inspection activities and conclusions denoting areas of improvement, areas of weakness and Team observations.

Also, an overall statement about the performance level of the licensee is provided.

4.1.1. Safety Tagging

To evaluate the effectiveness and performance level of site safety tagging systems, inspectors performed the following activities:

- Observed aspects of the generation and implementation of safety tagouts;
- Spot checked in-place tagouts for accuracy;
- Spot checked use and accuracy of laminated drawings used to display tagout boundaries to the Shift Supervisor;
- Interviewed Shift Supervisors and the Safety Tagging Supervisor to assess understanding of responsibilities and authority;
- Verified assessment of safety tagout impact on plant safety;
- Reviewed completion of weekly and monthly tagout audits; and
- Verified the use and assessed the effectiveness of the second licensed operator review in tagout preparation.

Improvements

- (1) The additional licensed operator review of safety tag-outs has increased the confidence in tagout adequacy. The reviews are thorough and effective in identifying errors during preparation of boundary packages.
- (2) The programmatic requirements of Procedure CCI-112J, Safety Tagging, have been strengthened, particularly in the areas of tagout boundary research, preparation and review, resulting in an improved safety product.
- (3) The use of a color coding scheme to provide highlight to the identification and classification of tagout packages has facilitated both the preparation and review of the packages.
- (4) The use of an equipment status board in the tagging office provided an effective display of information to tagging personnel.
- (5) Tagging representation at planning and scheduling meetings and shift turnover briefings increases the transfer of information to shift personnel.
- (6) The tagging group was reorganized to elevate the position of Safety Tagging Supervisor to the equivalent level of a shift supervisor.

Observations

- (1) The safety tagging group staffing appears inadequate to support some plant conditions, especially during a dual plant outage. Temporary assistance has been required from the operating shifts to meet unanticipated manpower demands.
- (2) The tagging group's technical expertise in the electrical and instrument and control (I&C) areas is being strengthened by adding additional electrical and I&C technicians.
- (3) Although red safety tags are normally used to provide positive control over functional components, the team noted that in a few cases the licensee utilized red tags to provide informational control for personnel and equipment safety.

Weaknesses

- (1) The licensee currently utilizes plastic-coated piping and instrumentation diagrams (P&ID) as visual aids for safety tag boundary package preparation and review. This tool was demonstrated to be cumbersome, inefficient and only marginally useful as evidenced by the following:
- Four sets of laminated prints were compared against the attached tagging record sheets. Each set contained one or more errors;
 - A significant number of man-hours was required to maintain the laminated prints current; and
 - The large number of prints required to display some tagouts made review by tagging and shift personnel inefficient and confusing. Numerous shift personnel felt more confidence in the additional licensed operator review than the fact that boundaries were reflected in the laminated prints.

The licensee is evaluating the efficacy of this administrative tool.

- (2) During a tour of the Calvert Cliffs control room on November 6, 1989, the Team identified a red danger tag assigned to control room panel 1C06 that was actually attached to the temporary Unit 1 refuel water level panel. Investigation revealed the tag had been relocated without completely documenting the transfer. After the inspector identified the problem the licensee subsequently removed the tag in question and reissued a new danger tag in accordance with the procedure. While the relocation of the danger tag most likely occurred prior to the issuance of the current revision of CCI-112, the Team felt this indicated a weakness in the licensee's identification of tagging discrepancies during routine observations and audits. Current requirements in CCI-112 provide specific instructions for the modification of tagouts.

- (3) The 30-day audits of all tagouts over 90 days old, as required by CCI-112J, Section X, had not been performed for the months of September and October 1989. When questioned by the inspector the tagging supervisor acknowledged the audits had been missed and initiated efforts to complete the required audits. The weekly tag index audits were reviewed and found to have been conducted as required by CCI-112. A non-conformance report (NCR) was written to document the missed audits.

The failure to complete the required field verification audits is a significant weakness in the administration and management of the site safety tagging system. In addition, at the time of NRC inspection, over a month after the audit was first missed, the missed audits had not been documented and senior operations department managers were not aware of the deficiency. Correction of this weakness is considered vital to the implementation and maintenance of an effective safety tagging system. Failure to complete the required audits is an unresolved item (89-81-01).

- (4) Tagout errors and deficiencies did not always receive proper documentation or management review and were not always incorporated into a comprehensive and formal corrective action program for followup and resolution. Examples include:

- Monthly audit discrepancies were routinely corrected by the auditor without supervisor review;
- Audit discrepancies brought to the attention of the tagging supervisor were in many cases not entered into a corrective action program nor was management informed;
- In July 1989 an aerator tank manway was positioned contrary to the instructions specified on the safety tag. An NCR was written but was not specific to the tag violation issue and was rejected by QC; there was no management followup. A specific NCR (No. 8802) was written on November 15, 1989, for this event after questioning by the NRC inspector;

- In July 1989 a condenser manway was shut by maintenance personnel contrary to the requirements specified on the tags while cleaning tubes using high pressure water spray. A change to the licensee's industrial safety manual deleting the use of danger tags for access ways if a monitor was continuously present was implemented on July 25, 1989, but no NCR or other formal documentation was generated to cover the initial violation of the tagging boundary. Site management was not aware of this event;
- The audit performed on November 12, 1989, resulted in noting a discrepancy associated with tagout 29-602 (for MO 209-091-81812). Two red safety tags had been removed from a lighting panel electrical breaker and the breaker closed contrary to the requirements specified on the tags. When questioned by the inspector on November 13, 1989, as to actions taken, the tagging supervisor indicated that an MR to provide locking devices for this type of breaker and a near miss report had been initiated. An NCR (No. 8801) was not originated until November 15, 1989.

The above examples of informally documenting, reviewing and resolving discrepancies associated with the safety tagging system is a significant weakness. Also, personnel were not clear as to the appropriate mechanism to document these deficiencies. Informal documentation does not provide assurance of appropriate management review and resolution. Informal documentation and resolution of tagging discrepancies is an unresolved item (89-81-02).

Licensee immediate actions to correct audit deficiencies and review audit discrepancies have been instituted and include:

- scheduling a portion of the monthly tag audit to be completed each week;
- implementation of written guidelines for performing the audit;
- providing for formal documentation and review of audit discrepancies; and
- providing for management review of audit discrepancies and resolutions.

Conclusions

While comprehensive and safe tagouts are generated and implemented, significant weaknesses were observed in the auditing of tagouts, and in the documentation and resolution of tagging discrepancies. In addition, the use of laminated drawings to display tagout boundaries to the shift supervisor proved to be cumbersome, inefficient, and only marginally useful. These weaknesses were not identified by the licensee's quality verification team prior to NRC inspection.

Improvements in the identified areas of weakness and in the overall administration and management of the safety tagging process are required to assure a satisfactory level of performance can be sustained to support safe operation of the facility.

4.1.2 Use of Procedures

The inspection team interviewed control room operators, control room supervisors, shift supervisors, workers, and site managers. Also, as available, the use of procedures was verified through observation of site activities. Inspectors assessed understanding of site policy in the use of procedures, understanding of the meaning of change-of-intent, compliance with procedure requirements, use of pen-and-ink changes, and overall safety perspective in the use of procedures.

Improvements

The following areas of improvement were observed:

- (1) All personnel interviewed showed a heightened awareness of the importance of implementing procedure requirements;
- (2) Operators showed increased attention to evaluating procedure changes for change-of-intent;
- (3) An improved process for operators to implement pen-and-ink changes allows correction of procedure deficiencies. Use of the pen-and-ink change is limited to five changes on any one procedure. At that time a procedure revision is required; and
- (4) Operators are reviewing procedures prior to use and stopping procedure implementation to correct procedure deficiencies.

Observation

Inspectors observed that site operating instructions (OI) sections were not arranged in a logical sequence. Instead, procedure sections appeared to have been added chronologically as the need for procedural guidance for additional types of systems evolutions or manipulations were identified over the years. Sections covering similar or complementary evolutions are often not grouped together within the instruction. This arrangement creates difficulty in identifying the applicable section of the operating instruction. This observation reinforces the need for procedure validation and long term procedure upgrade.

Weaknesses

Two examples of inadequate procedures were observed. The first involved surveillance test STP 0-62-1, which verifies valve positions for each plant operating mode. For the valves required for the Safety Injection (SI) boration flow path, no valve positions were specified. The applicable Technical Specification was referenced, Section 4.1.2.1, but this only specified that valves be in the "correct" position. This surveillance would permit valves, such as the refueling water storage tank outlet valves, to be either open or closed.

The licensee had previously identified this deficiency and was in the process of implementing a procedure revision to correct this deficiency. The inspector reviewed the proposed change and verified it addressed the deficient condition. The licensee committed to revising this procedure by December 31, 1989.

The second example of procedure inadequacy was the absence of an approved procedure to implement the Technical Specification-required boration flow path. Abnormal Procedure AOP-1A, used for inadvertent boron dilution, did not address using the high pressure safety injection (HPSI) pumps. The HPSI pump was the only boration flow path available as the charging pumps were not in service.

The need for approved procedure guidance for operation of the HPSI pump is safety significant, not only to provide boration in the event of inadvertent dilution, but also to provide administrative measures to limit plant pressurization due to HPSI mass addition in the event this path is used. In certain low temperature plant conditions, excessive HPSI addition could exceed pressure relief capacity.

Therefore, control at HPSI injection rate would help provide over-pressure protection while at low temperatures. In the plant condition at the time of the inspection, over-pressurization was not possible since pressurizer manways were removed to provide over-pressure protection. The licensee had previously identified the need for an approved procedure for this mode on October 25, 1989, but had considered the need to generate a procedure not to be urgent. On November 15, 1989, after questioning by the inspector, the licensee initiated corrective action to write a procedure for the current plant boration flow path. This is another example of a condition adverse to quality which was not documented by site corrective action systems. As a result, appropriate corrective action was not promptly initiated.

The licensee committed to implement a procedure addressing the use of the HPSI system as a boration flow path by December 1, 1989. The absence of an approved procedure for use of the HPSI pumps as a boration flow path is unresolved (UNR 89-81-03).

Earlier NRC inspections had identified a concern involving the use of General Supervisor Nuclear Operations (GSNO) standing instructions. Some were being used to direct operator actions that could affect nuclear safety. The licensee had committed to identifying and eliminating these standing instructions after incorporating the directions they provide into appropriate procedures. In a letter to NRC Region I office, dated October 27, 1989, the licensee indicated completion of this commitment.

NRC review identified that one of the standing instructions identified as a concern by the NRC Special Team Inspection, nine additional instructions identified by the licensee, and another providing interim instructions for temporary modifications, were still in place after incorporation of these requirements into approved procedures. This was contrary to what was stated in the October 27, 1989 letter. In addition, the licensee's quality verification check did not identify that these were still in place.

Prior to the completion of the inspection, NRC inspectors verified the standing instructions in question were deleted. Continued management attention is required to ensure appropriate use of these instructions.

Conclusions

Overall, the licensee has been effective in improving performance in the control and use of site procedures. Operators displayed their commitment to adhere to procedure requirements and the resolve to stop implementation in order to correct procedure deficiencies. With the exception of the procedure deficiencies identified above, an improved level of performance in the use of procedures has been achieved.

4.1.3 Control of Plant Status and Activities

Inspectors conducted plant tours and observed the use of site tags, observed identification of out-of-service equipment, and assessed the general use of tags at the site. Inspectors observed shift turnovers and verified the transfer of plant status information, the use of turnover checklists and the conduct of panel walkdowns. Control room operators were interviewed to assess their knowledge of plant status, ongoing activities, and the usefulness of information transfer systems. Reviews were conducted of control room logs, documents and applicable procedures.

Improvement

Inspectors concluded that steps taken to make plant status information available to operators were improvements. Shift briefings are effective at transferring plant status information from one shift to the next as well as identifying upcoming activities. Other mechanisms include the use of equipment status sheets during shift turnovers, the use of improved daily tagout printouts and planning and scheduling representative presence at shift briefings. Inspectors observed an expanded use of equipment out of service (OOS) tags to display equipment status to operators.

The Team determined that CCI-117, "Temporary Modification Control," Revision 1 dated September 30, 1989, provides adequate controls to ensure review for plant safety impact prior to implementation. CCI-117 requires a design engineering evaluation to be performed for each proposed TM. A questionnaire is employed to screen TMs for unreviewed safety questions or effects on nuclear safety and POSRC review is required. This detailed review is regarded as an improvement.

Observation

Inspectors noted during physical inspection of control room panels that a large number and variety of tags were present. These were predominantly temporary notes used to identify post-maintenance testing requirements, but also included safety and equipment OOS tags. The number of tags increases the likelihood of valve and component conditions being concealed and this presents a potential human factors concern. Since it is anticipated that these tags will be removed prior to startup, the safety concern should be alleviated. Further licensee management attention is warranted to verify the removal of unnecessary tags from the panels.

Weakness

During review of procedures that employ TMs but are exempt from control by CCI-117, the team determined the licensee does not programatically ensure these TMs are reviewed for safety impact prior to mode changes. This was regarded as a weakness. The licensee has committed to implement prior to startup, a formal safety screening of TMs installed outside CCI-117 as a prerequisite to mode changes.

Conclusions

Overall, the licensee has been effective in improving performance in the control of plant status and activities. Effective measures are in place to assure control room operators and shift supervisors are aware of equipment status and relevant plant activities. With the exception of the weakness identified above, a satisfactory level of performance has been achieved in the control of plant status and activities to support safe operation of the facility.

4.1.4 General Items Inspected

- (1) NRC inspectors observed that the schematics used to provide aid to the operators in the operation of service water valves did not evidence review and approval. The licensee was in the process of incorporating these diagrams into their operator aid program. Prior to the completion of the inspection, NRC

inspectors verified that these diagrams had been labelled and had been entered into the licensee's operator aid program. The inspector had no other questions.

- (2) The inspectors questioned the securing of equipment mounted on wheels in the #1 cable spreading room. The licensee had previously performed an evaluation of this equipment and had concluded the method of securing was satisfactory. The inspector had no other questions.
- (3) During plant tours, NRC inspectors identified plant temporary modifications that were controlled outside of the Procedure CCI-117, "Temporary Modification Control." The inspector reviewed the corresponding procedures which controlled installation and removal of these temporary modifications. The inspector verified that each procedure incorporated the same level of installation and verification as would be required by CCI-117. No unacceptable conditions were identified relative to installation and verification. A weakness regarding screening of these items for mode change applicability is discussed above.
- (4) The Team reviewed active TMs for Unit 1. Three TMs were walked down and no discrepancies were noted. Detailed reviews were made of the safety evaluations for selected TMs. These safety evaluations adequately addressed the appropriate safety issues. Quarterly audits were found to be documented. One minor administrative discrepancy noted was that two TMs could not be immediately located in the TM log. They were later found by the licensee.
- (5) During plant tours and panel walkdowns, inspectors identified unlabeled cables and wires which were not labelled as spare or otherwise controlled by approved procedures. These cables were compared against current plant design and in each case were found to have been spare or abandoned cables. No unacceptable conditions were identified.
- (6) As a result of the concerns identified in the use of General Supervisor Nuclear Operations (GSNO) Standing Instructions, GSNO Notes and Instructions were reviewed for plant operating instructions. GSNO Notes and Instructions are a lower-tier guidance mechanism than the GSNO Standing Instructions. No unacceptable use of notes and instructions was identified.

- (7) The Team reviewed the safety tagging associated with the rewiring of the boric acid selector and control switches. At one point during this work, the #11 boric acid pump operating switch had a red safety tag applied while all wiring was removed. The Team verified that at no time during the performance of this work was an actual safety or equipment hazard present. The Team questioned the suitability of applying a red safety tag to a switch with no control wires present. The licensee responded that this was conservative in that it ensured control of the equipment after the wires were reconnected. No unacceptable conditions were identified.

During the performance of the modification mentioned above, boric acid operating switches #226X and #226Y were removed from the control room panel. The Team verified that the removal of these switches was within the scope of the modification package. No unacceptable conditions were identified.

- (8) The Team noted that partial performance of surveillance test procedures requires a procedure change. This results in added work to control room operators and to the POSRC in reviewing and approving these changes. The licensee has indicated, as a long term improvement effort, the intent to write surveillance test procedures to allow partial implementation when appropriate. No unacceptable conditions were identified.

4.2 Maintenance and Surveillance

Maintenance and surveillance activities were inspected within the context of the three broad areas outlined in NRC's May 25, 1989 CAL No. 89-08. These areas are: (1) control of system status, (2) procedures use and control of procedure changes, and (3) control of work activities. The Team interviewed site personnel, observed maintenance and surveillance activities, and reviewed various documents to support an assessment of the licensee's performance in these three areas.

4.2.1 Control of System Status

4.2.1.1 Scope of Inspection

The Team verified in the plant that tagouts had been correctly applied for selected mechanical and electrical corrective maintenance orders and an instrumentation and controls modification. The equipment status board and the control room supervisor's acknowledgement of selected maintenance order tagouts were also verified. The Team verified through interviews and reviews of tagout clearances that job supervisors were performing proper pre-job tagout walkdowns.

4.2.1.2 Findings

In performing the above inspections, no deficiencies were identified.

The Team observed that separate tagouts were applied for each maintenance order; therefore, a piece of equipment may have multiple tagouts. This provided effective control of system status when several jobs were being worked on the same system.

4.2.1.3 Conclusion

Within the scope of the maintenance activities inspected, the Team concluded that a satisfactory level of performance was observed in the control of system status to support the safe startup and operation of the plant.

4.2.2 Procedure Use and Control of Procedure Changes

4.2.2.1 Scope of Inspection

The Team verified that procedures were properly followed by observing the performance of maintenance, modifications, surveillances, and testing. The Team observed the licensee's identification of procedural problems and the processing of procedure changes. The Team also reviewed completed maintenance packages, surveillance procedures, and procedure changes. Interviews were conducted with workers and supervisors to determine if a policy of procedure adherence is understood and accepted.

4.2.2.2 Findings

Procedures were properly followed in all activities observed.

The Team observed one occasion where work was stopped and two occasions where the start of work was delayed when the person using the procedure encountered a problem with the procedure. Although there are still procedural quality issues, the licensee staff has demonstrated that they are alert to procedural deficiencies and that they will stop to correct them.

Licensee personnel established a good awareness of change of intent considerations when evaluating maintenance and surveillance procedure changes.

Test procedure feedback sheets were a useful tool for recommending upgrades to test procedures.

Maintenance orders now have a section for recording a summary of actions taken and a section for recording a detailed narrative of the actions taken. The maintenance orders reviewed all had adequate descriptions of the work performed.

Operators and technicians reviewed procedures prior to use. Operators also walked the procedures through at the control panels prior to use.

Workers and supervisors expressed a commitment to adhere to procedures and to work toward their improvement. Continued licensee emphasis on verification of procedural adherence is warranted particularly since the long-term procedures upgrade program is still in its early stages.

4.2.2.3 Conclusions

The licensee has been effective in improving the use of procedures. Licensee staff shows a commitment to adhere to procedures. They are also alert for procedural problems and will stop and fix them. The licensee's use of procedures and control of procedure changes is adequate to support the safe startup and operation of the plant.

4.2.3 Control of Work Activities

4.2.3.1 Scope of Inspection

The Team reviewed the tracking, prioritization and scheduling of maintenance orders. The adequacy of pre-planning was evaluated through discussions with supervisors, planners and workers and by reviewing work packages and observing on-going work in the plant. The supervisory job observation program was reviewed. The documentation of completed work was reviewed. The Team observed and reviewed the development, tracking, performance, and evaluation of post-maintenance testing.

The Team evaluated the scope of the consolidated surveillance test program. Surveillance test procedure scheduling was reviewed. Surveillance tests were observed by the Team. Selected permanently installed instruments were verified to be calibrated. Corrective actions for non-conformance reports on uncalibrated instruments, maintenance orders, and a surveillance trends report were reviewed. Test coordinators were interviewed.

4.2.3.2 Findings

The Team noted a significant program strength, in that the maintenance department has established a supervisory job observation program. This consists of supervisors observing maintenance and testing in progress, evaluating the work, and having followup feedback sessions with those involved. The goal is for each supervisor to spend one-day per month in the field. Twenty-seven of thirty-five supervisors completed documented observations for the month reviewed by the Team. The supervisors made meaningful, critical, and constructive observations and comments. Maintenance management intends to formalize this program by January 1990.

The Team noted two areas of substantial improvement.

- (1) The administrative procedure for control of maintenance (CCI-200) is a good procedure that should provide strong control over maintenance. It provides for better documentation of the initial problem, more detailed work instructions and post-work test requirements, controlled vendor technical information and better documentation of completed work.
- (2) Controls and accountability for surveillance scheduling have been improved and assure proper scheduling in the areas assigned functional test coordinators.

The Team observed that the scheduling function is developing rapidly. The licensee has implemented a three-day schedule and work groups interviewed displayed an understanding that they must use the scheduling process.

BG&E had a corrective maintenance backlog of about 2700 maintenance orders of which several hundred are priority A, i.e., to be completed before startup. The actual number of maintenance tasks is less than the number of work orders. The difference in those numbers is due to the licensee's practice of subdividing a task into several maintenance orders, partly to achieve better control over work activities.

The Team found that detailed work packages were prepared and in use in the field with adequate job specific instructions to accomplish the assigned tasks. No ad-hoc changes of the work scope were observed. Quality engineering review of safety-related work prior to scheduling and the final supervisory review of work packages for completeness were notable improvements.

Maintenance and QC personnel have been trained in, and were knowledgeable about, the new program and procedure requirements. Although the new controls were deemed cumbersome by some, overall worker attitudes about the new procedures were positive. Personnel performing the work were qualified, as verified by the training and qualification status book maintained by the first-line supervisors and the assistant general supervisors.

Post-maintenance testing guidelines are incorporated into the maintenance administrative procedure, CCI-200, by reference. These guideline documents include an individual matrix for each type of component. The matrix describes the post-maintenance test requirements for each type of maintenance task.

The Team reviewed a sample of on-going maintenance tasks and evaluated the technical adequacy of prescribed testing. No deficiencies were noted, except in the one case where no acceptance criteria were specified for the test. Specifically, post-maintenance testing following inspection/replacement of the spring pack for a Limitorque motor operated valve operator under MO 209-285 required valve stroke time test and measurement of running current either at the valve actuator or at the breaker. However, no acceptance criteria were specified. In response to this finding, the licensee retrained the responsible systems engineer, planner, and the contractor's QC personnel.

The Team observed that the licensee is still working out implementation and coordination difficulties with respect to the new maintenance controls. This results primarily in efficiency problems. Although this was not a safety concern to the Team, the NRC could become concerned during operation, if equipment important to plant safety undergoes unnecessarily long out-of-service times due to unreasonable delays in starting or coordinating work.

Within a sample reviewed by the Team, nonconformance reports in maintenance and surveillance were responded to adequately. One surveillance nonconformance reviewed by the Team was the result of an adverse trends report from the Independent Safety Evaluation Unit for a ten-month period beginning in December 1988. The

resolution of these concerns was based on improvements due to consolidation of the surveillance test program, specific corrective actions completed for each event, and performance of surveillance test procedure reviews. The surveillance test procedures reviews have recently begun. The licensee informed the Team that a contractor will complete the first phase of their review (referred to as the Level 1 review) and that BG&E will screen their findings for safety significance and make a recommendation to POSRC as to disposition prior to startup.

The Team reviewed several technical issues and developed one significant observation and three unresolved items as discussed below.

The Team observed that licensee controls over motor operated valve (MOV) torque switches are behind industry general practice. The Team also noted, however, that the licensee's use of torque switches in motor operated valves differs from typical industry practice in that the licensee uses the limit switch as the primary control device in opening and closing. This practice lessens the importance of the torque switch somewhat. Regarding torque switches, the Team was still concerned that, if set too low, the torque switches might unnecessarily stop valve motion when a dynamic condition is combined with a slightly degraded valve condition (e.g., tight or dry packing, worn operator). This is an unresolved item (50-317/89-81-04), but, based on the Teams understanding of the licensee's overall MOV program, is not considered a restart issue.

The Team reviewed the licensee's ongoing root cause analysis on the recurring concern of noisy shutdown cooling heat exchangers under some flow conditions. Both Unit 1 shutdown cooling heat exchangers have a documented history of rattling noise at certain flow rates. On November 10, 1989, the licensee conducted a multi-disciplined group meeting involving representatives from Operations, Systems Engineering, Design Engineering, Performance Engineering, ISI, Chemistry, Health Physics, Outage Management, Materials Lab, and consultants for vibration analysis. The licensee plans to conduct additional flow tests in conjunction

with acoustic/vibration analysis. The Team determined that the licensee's approach to root cause analysis and developing corrective actions appeared to be thorough and technically conservative. The licensee also initiated a CCI-118 form on November 14, 1989, to evaluate reportability. The licensee stated that a Licensee Event Report will be issued documenting their root cause analysis and corrective actions. Resolution of this concern has been identified as a Unit 1 restart concern (UNR 317/89-81-05).

In reviewing operating history of the shutdown cooling heat exchangers, the Team noted that the licensee had identified in June 1988, that the component cooling water flows to the shutdown cooling heat exchangers were found throttled to approximately 2200 gpm single pump flow as documented on the Possible Reportable Event Report dated June 2, 1988. It also stated that the FSAR Table 6-5 and 9-14 require total flow rate of 4820 gpm through the two shutdown cooling heat exchangers. This flow rate is used to show by analysis that, under post-LOCA conditions, the containment can be cooled down to 120 degrees F in 17 days by the containment sprays and containment coolers.

The licensee had subsequently repositioned the heat exchanger inlet valves to increase flow. An engineering analysis was performed to generate a new post-LOCA containment response curve using the reduced flows in effect prior to June 1988. The licensee determined that the duration of the LOCA profile increased from 17 days to 23 days at a flow rate of 2200 gpm to each heat exchanger. The licensee examined the new profiles in light of environmental qualification requirements and concluded that the 23-day profile was enveloped by their design profile and, therefore, did not invalidate the original EQ evaluation. The possible reportable event report also concluded that this event was not reportable. The Team however, is of the opinion, that this event should have been reported per 10 CFR 50.72(b)(11)(B).

This item is unresolved pending further staff review of the issue for appropriate enforcement action if warranted (UNR 317/89-81-06).

Within the areas reviewed, the Team classified one item as a licensee weakness. In order to improve control and accountability over Surveillance Test Program (STP), the licensee had consolidated many program responsibilities under a STP coordinator. However, BG&E took a narrow approach to the centralization of the surveillance test program in not including all surveillances under the surveillance test program. Examples of areas not included in the consolidated program under procedure CCI-104 are radiological, chemistry, environmental and core engineering surveillances. This decision appears to have been made on the basis on a qualitative assessment that these other areas did not have the degree of scheduling and tracking problems as other areas. However, the decision did not appear to have been fully thought out. For example, mode change checklists incorporate completion justification signatures for Technical Specification surveillances, but only for those functional areas in the consolidated program. The licensee committed to incorporate certification signatures for the other surveillance areas into the checklists (Procedure OP-6) before startup. (See Section 3.5.3)

Further, the Team did not concur with the logic presented thus far for leaving program responsibilities distributed (i.e., unconsolidated), nor believe that the licensee had fully evaluated the degree to which scheduling and tracking problems had occurred or could potentially occur in the unconsolidated areas. As detailed in Section 3.5.3, the licensee agreed to evaluate this area over the next year. Completion of this evaluation is not a restart item.

4.2.3.3 Conclusions

The supervisory job observation program is a strength and should be a useful tool in verifying procedure use and control of work activities. Improvements in planning, scheduling, and procedure adherence have resulted in better control of work activities. Including all surveillances in the consolidated surveillance test program should be evaluated. The licensee's control of work activities is adequate to support the safe startup and operation of the plant.

4.3 Safety Assessment and Quality Verification

4.3.1 Introduction and General Scope of Inspection

This portion of the inspection assessed BG&E's effectiveness in making improvements in quality assurance and assessment of safety areas. The inspectors emphasized their assessments on the following: 1) control, use and changing of procedures; 2) identification, control and prioritization of conditions adverse to quality, including evaluation of restart issues, and 3) management communication of goals and expectations.

The Team reviewed procedures that controlled safety-related work. This included evaluation of the newly required verbatim adherence and change of intent issues. The inspectors assessed the methods for identification of conditions adverse to quality and the prioritization and control of corrective actions. The methods reviewed included nonconformance reports (NCRs), quality assurance surveillance and audit findings, open item lists for plant and off-site review committees, and the restart item list of items that needed closure before Unit 1 restart. The evaluation of communications of management goals and objectives included assessment of the effectiveness of these efforts based on discussions with plant personnel. The Team reviewed several engineering issues to determine the acceptability of reportability and evaluation issues.

4.3.2 Procedure Use and Control

4.3.2.1 Scope of Review

BG&E had committed to identify areas related to procedures that needed improvement. This had been necessary to correct deficiencies that led to several violations of containment integrity and other less severe problems. The major corrective action taken required verbatim adherence with procedures and an increased awareness of changes to the intent of procedures.

The inspectors examined procedure content, usability and the understanding of procedures by BG&E personnel. Particular interest was paid to the application and acceptance of this requirement. The inspectors reviewed procedure change

processes and change of intent determination processes and evaluated worker understanding and implementation of these processes. The inspectors assessed the human performance evaluations system (HPES) reviews to determine if they had appropriately completed identified areas of corrective action to prevent these instances in the future. They reviewed the long term Procedure Upgrade Program (PUP) to evaluate management's commitment and initial efforts in this area.

4.3.2.2 Findings

The Team observed the use of procedures by BG&E personnel. These observations showed that BG&E personnel were following procedures properly. These personnel had a good questioning attitude and stopped when necessary to resolve procedure difficulties. The policies for procedure use, changes, and the investigation of noncompliance issues were effective. The Team concluded that BG&E made demonstrable progress in the area of procedures.

The Team determined that the plant staff understood the strictly defined and enforced policy on verbatim adherence. These policies have nearly eliminated instances of procedural noncompliances. While people understood this new requirement, several individuals stated that they felt as if they could not use their knowledge of the plant or systems. Licensee management recognizes this and was continuing efforts to attain full support and complete proper understanding of procedure adherence policies. Management is also encouraging identification and correction of procedural deficiencies. The plant staff has documented a significant number of procedural deficiencies. Workers interviewed cited management attention to correct procedure problems as one of the factors responsible for the improvement in the identification of these deficiencies.

BG&E personnel understood the methods for completing a procedure change. Implementation of a revised CCI 101 (procedure development) addressed, through a checklist the determination of whether a given change would cause the intent of a procedure to change. This appeared to be adequate, but the inspectors observed that questions asked on the form were difficult to interpret and implement. The plant staff substantiated this observation during discussions. However, BG&E personnel were making conservative determinations as to which procedure changes constituted changes of intent. The team questioned whether during plant maneuvering, the cumbersomeness of this form might distract operations personnel attention from the plant while pursuing procedure changes. Management was aware of these concerns and considered that the importance of placing the plant and equipment in a safe and stable condition before pursuing a procedure change is well understood among operators. Licensee staff understanding of the checklist for intent change determination can be expected to improve with use of the form.

The Team determined that when a change of intent would not occur, BG&E procedures now allow a "pen and ink" procedure change. This type of change requires the approval of two senior reactor operators. Personnel interviewed indicated that improved procedures for correcting errors through this process and a more responsive document control system had contributed to improved procedure use.

BG&E's Quality Assurance Independent Safety Evaluation Unit (ISEU) conducted thirteen HPES reviews of procedure noncompliance violations since the beginning of 1989. ISEU investigated examples of inadequate procedures, inattention to detail by personnel and other human performance problems. The Plant Manager received the corrective action recommendations from each of the HPES reviews. The Team examined several of these reviews, finding them to be appropriate and able

to identify root causes. The Team determined that the straightforward procedure recommendations were implemented. However, the more complex programmatic issues, such as a recommendation to establish a separate shift supervisor on the unit undergoing outage, were still under consideration by BG&E management. It was also observed that there was no formal prioritization process for HPES open items. Therefore, there was the potential for issues being left unresolved for an unduly long time.

The HPES investigation of the July 17, 1989 reactor coolant system filling incident, which occurred on mid-shift, was exceptionally noteworthy. The effectiveness of these evaluations resulted in the operations department electing to limit the performance of scheduled surveillance testing to the second shift. BG&E also made shift personnel aware to be more attentive to potential errors on the first two days of mid-shift.

The Team reviewed the Procedure Upgrade Program (PUP) and interviewed responsible personnel. Management commitment to this project was evident from the assignment of a Program Manager and the approval of a program plan and of extensive monetary and personnel resources. The Team found that the program had a significantly broad scope. The goals and objectives appeared to address the concerns raised during the Special Team Inspection (STI). The schedule and budget for implementation appeared adequate. The Program Manager's organizational skill and determination to implement the program were noteworthy.

4.3.2.3 Conclusions

The Team concluded that BG&E has taken adequate action to address the issues related to procedural compliance. Plant personnel understood the need for verbatim adherence to procedures. The change of intent determination process, although complex, properly controls the use of the pen and ink change. The pen and ink change allowance has removed some of the constraints and administration burden of the change process. Although in some instances these new requirements have slowed work, they have been effective in getting performance to a higher standard.

The HPES reviews were seen as a positive step and have generated numerous procedural changes to prevent specific procedures from causing the same problems twice. However, the Team observed that there was no formal prioritization process for these items. The more programmatic issues identified in HPES reviews needed appropriate management attention and prioritization to allow their disposition.

Initial indications were that the PUP had received adequate attention and support thus far.

4.3.3 Corrective Action Systems

4.3.3.1 Scope of Review

BG&E committed to improving the identification and control of conditions that potentially did not conform to quality standards. The Team reviewed the various systems employed by BG&E to perform this function. These systems included committee open items, Nonconformance reports (NCRs), Quality Assurance surveillance and audit findings, the Independent Safety Evaluation Unit (ISEU) findings and functions of the on-site and off-site review and plant operating assessment committees (POSRC, OSSRC and POEAC). BG&E personnel's understanding of these systems was assessed during interviews. The major corrective action systems were "walked down" by the team to evaluate the methodology used, the flow of information, and the screening and the resolution processes used. The Unit One Restart List was reviewed to determine if it was effective in identifying and tracking issues that needed resolution before restart.

4.3.3.2 Findings

The Team found that the methods of identification of conditions with the potential of being adverse to quality were diverse. Further, they identified that the interactions of these systems were not well defined and subject to interpretation. The Team identified that QA audit findings did not get formal review to determine if NCRs were

needed. The Operations Department reportability determination process for identification of potentially nonconforming issues was not fully adequate. However, even with the diversity and poor interaction of methods, the Team determined that BG&E was for the most part, though initiative and conscientiousness of plant staff, identifying and correcting appropriate conditions. The POSRC and OSSRC exhibit a good safety ethic. Internal BG&E ISEU reviews of the NCR process were reviewed by the Team and found to be proper. The Team determined that the POEAC was doing an adequate job of identifying potential issues raised by the industry. The Unit 1 Restart list was reviewed and found to contain the appropriate conditions that needed resolution before restart. The Restart List was highly visible and management was encouraging staff to bring forward early those emerging issues which could require disposition before restart.

Activity in the NCR system had increased over the last several months. The General Supervisor Quality Assurance (GS-QA) issued a memo, in July 1989, to all General Supervisors, which encouraged a lower threshold for writing a NCR. This memo focused attention onto the areas of deficient material, failures or malfunctions of systems and components, and inadequate control and documentation. Before the lowering of the threshold, individuals other than Quality Control (QC) generally did not write NCRs. QC has trended the NCR generation rate, which shows that the total number of NCRs generated on a monthly basis has increased. Further, the percentage of NCRs generated by the QC organization has decreased while the percentage generated by other plant organization has increased. The Team determined that the process for issuing and tracking NCRs was cumbersome. However, the Team reviewed numerous NCRs and determined that personnel were implementing the process properly, despite its cumbersomeness. The NCRs reviewed by NRC appeared to be properly categorized relative to restart.

The Team questioned the appropriateness of the methods used to inform operations personnel promptly of nonconforming conditions. The NCR review process was not well defined in this regard and could lead to confusion. Recent revisions to CCI 116 (Control of Deficiency and Nonconformance Reports), included a check to determine the potential reportability of a given condition. The supervisor of the person generating the report completed this first review. If there were questions or if it was clearly reportable, this person notified the shift supervisor. The shift supervisor then took the required action to determine system operability and/or reportability requirements. But there was no set time limit for this determination, which could lead to operability concerns not being addressed in a timely manner. This process reflected more concern for quality control than for operational considerations. This procedure appeared to be more in line with the requirements of a plant under construction, where the timeliness of operability determination was not of great concern. However, the team reviewed numerous NCRs and, while the process was not formal the Team identified no failures to inform operations personnel in a sufficiently timely manner of nonconformances.

The Team reviewed several QA Audits and the accompanying findings. They determined that there was no formal review process for these findings to determine if an NCR needed to be written. QA audit findings did get reviewed during the audit process but the communication of NCR type conditions was not formal. Identified problems during an audit were passed to the responsible supervisor or shift supervisor verbally. If QA then felt that action would be taken, no formal documentation would be completed. The Team was concerned that audit findings were not fully reviewed for nonconforming conditions. Also, audit findings were not formally reviewed to evaluate whatever corrective measures should be restart prerequisites. Based on the Team concerns, BG&E

performed a review of all outstanding QA findings for reportability/operability concerns. BG&E completed this review during the inspection with no additional NCRs or restart items added. BG&E also committed to formally review audit findings to determine which corrective actions should be restart prerequisites.

The Operations Department process for analyzing potential operability and reportability concerns is documented in procedure CCI-118 (Nuclear Operations Initiator Reporting Requirements). When the shift supervisor receives information that could cause a safety-related system/component to be inoperable, he fills out a form from CCI-118. This form addresses the operability and/or reportability requirements. The procedure contains no specific guidance regarding the potential need for a review of NCR requirements. If an NCR was not generated, an issue that requires corrective action, if not reportable, might not have been addressed. In discussions with the licensing staff in charge of this review, neither the requirements nor the procedure were clear in this case. The Team viewed this as a weakness. Late in the inspection, the Licensing Manager provided instructions to his staff to initially address this issue. Further, he committed to revise procedure CCI-118 to clarify this area by February 15, 1990.

The ISEU has been reviewing the NCRs processed to determine any significant trends. Two specific trends interested the inspectors. First, ISEU observed a trend in surveillance tests identified with inadequate acceptance criteria. Second, ISEU observed a trend in instances where the scope of a maintenance order was changed subsequent to starting work. The Teams review of these issues is incorporated in the surveillance and maintenance area. The job being done in identification of these trends was noteworthy; however, because of the limited time the program has been functioning, there was not sufficient information as yet available for the Team to reach a conclusion on how well line management is using the trend information.

The Team observed OSSRC and POSRC meetings and determined each to be performing a proper safety function. The OSSRC meeting attended showed that members were able to discuss items freely and able to ask good probing questions. The OSSRC open item list was short and well managed.

The Team identified several inappropriate aspects of POSRC procedure review process and committee makeup. The Plant Manager had delegated his authority as the POSRC Chairman to two General Superintendent (GS-O and GS-QA) and to a person who is filling in as an Administrative Assistant to the Plant Manager. The use of the GS-QA as an alternate Chairman represented an inappropriate cross-connect of the quality assurance and plant line management. It was of interest that QA personnel had questioned this before the Team. The Acting Chairman was also signing for the Plant Manager on procedures which were forwarded by the POSRC for approval. The Team found this to be inappropriate because the Plant Manager provides a line management function in approving procedures recommended by POSRC. Further, the Plant Manager might not in all cases approve POSRC recommendations, and in such a case, a higher level of management would be informed of the difference. Again, the use of the GS-QA in the management function of approving procedures would not be appropriate unless he were removed from concurrent QA duties. Regarding committee makeup, two alternate members, in addition to an alternate chairman, were sometimes being counted as part of the POSRC quorum. The Team considered this to be an excessive use of alternates on the POSRC. The Team informed the Vice President of these findings. The Vice President took actions to limit the signing of procedures to the Plant Manager or Acting Plant Manager, and to allow the GS-QA to be the Acting Plant Manager or Acting POSRC Chairman only when he is relieved of QA duties. After the inspection, but prior to issuance of this inspection report, the licensee also changed the POSRC procedure, CCI-103, to clarify quorum requirements.

The POSRC open item list had a large number of open items (approximately 200) and a large number (about 70) of delinquent items. The Team found that this number of open items was excessive and showed weak tracking and prioritization of issues and pursuit of resolutions. BG&E committed to incorporating a signoff in OP-6 mode change checklist for startup to ensure that this list is reviewed and those required to be complete prior to restart are complete. As part of an evaluation of the validity of POSRC item closures, the Team reviewed a closed POSRC item dealing with the ECCS pump room unit cooler. The evaluation presented to the POSRC by engineering personnel was factual and properly prepared to allow final closeout. One minor deficiency was noted in that there was not a final statement in the evaluation to indicate that the design basis for the system had not been changed. After the end of the inspection, but prior to issuance of this report, the licensee issued a POSRC Presenter's Guide, as part of a revision to the POSRC procedure, CCI-103, which specifies the necessary attributes of for presenting an item for POSRC review, evaluation, and closeout.

The POEAC open item list is long (i.e., over 120 open items). However, the Team determined the number of items that sent out to specific individuals which required more than information only was relatively small. The Team did check the followup based on one event dealing with safety-related 4160 KV circuit breakers. The event involved failure of a spring in the same type breakers used at Calvert Cliffs that would cause failure of the breaker to stay closed. BG&E received information on this event through the INPO network. POEAC determined there was not enough information to require further review. The POEAC sent this item to the circuit breaker specialist in the engineering group. The Team requested that the engineering staff get enough information to review this event for applicability to Calvert Cliffs. The engineering staff received the necessary information and sent a revised commitment to the POEAC Chairman to allow tracking for closure.

The Restart List set up to track restart issues was working well. The Plant Manager designated the items that should be on the list. The items considered by the Plant Manager have been maintenance requests, NCRs, engineering field change requests, POSRC open items and others. The Team requested that BG&E review the numerous corrective action system to determine if any other items needed to be incorporated. BG&E completed this review on November 17. Throughout the inspection, the Team looked for technical issues which may have been omitted from the restart list, misclassified, overlooked, or inadvertently deleted. No such errors in the restart list were identified.

4.3.3.3 Conclusion

The Team concluded that a uniform and standardized system of problem identification and prioritization did not exist. There were numerous apparently fragmented identification/tracking systems on-site which feed through unclear interfaces to the NCR process. Although concerned with this, the Team considered these systems to be for the most part functioning acceptably to capture and cause evaluation of safety significant concerns.

The Team was confident in the current restart list because of aggressive management attention. Since the restart list is a specialized mechanism and the other multiple systems will be relied upon during operation, the Team considered it important that the licensee provide additional assurance that deficiencies identified during operations will be properly classified, prioritized, reviewed and tracked to ensure appropriate corrective actions. This item is discussed in Detail 3.4 and a licensee commitment is included in Detail 3.5.1.

4.3.4 Communication of Goals and Expectations

4.3.4.1 Scope of Review

The Team assessed the status of management involvement, control and communication of goals and expectations to the staff. This was done through interviews of corporate management and plant personnel. The Team reviewed the continuing corporate support for the Performance Improvement Plan.

4.3.4.2 Findings

The Team found that the attitude of a typical plant worker has changed. BG&E's development and communication of these new goals and expectation has been effective.

The development of the corrective action based on the STI and CAL was done primarily at the general superintendent level and above. The actions taken for the most part have been effective. However, it does not appear that all levels of site staff commented on and made a difference in the development of the corrective actions. The Team noted that some personnel in the operations ranks were disappointed that they did not get the opportunity to participate in development of actions that would directly affect them.

Management communication techniques were effective. The knowledge of goals and expectations has increased at the worker level. The Corporate and site management interviewed were committed to improving the communication of these goals. The Team interviewed other employees from several levels who indicated a high degree of awareness of management goals and expectations. This included the areas of identification of problems, use of procedures and the overall emphasis on nuclear and personnel safety.

4.3.4.3 Conclusions

BG&E's personnel understanding of company policies and management expectations was obvious to the Team. Although the Team noted a spectrum in the degree to which staff had accepted these new policies, the acceptance appeared to be steadily improving. The Team noted the extraordinary efforts taken on the part of management and that these were commendable.

4.3.5 Licensee Training Program Initiatives

BG&E made improvements in two specific areas dealing with training. First, a program for training of supervisors was in the development phase. A detailed job task analysis was included and was found to be a good practice by the inspectors. Second, a program for training the system engineers was developed. This program included a classic Systematic Approach to Training guideline and includes introductory, nuclear systems and in plant operational training. These initiatives should increase supervisory and system engineering skills.

4.3.6 Overall Conclusions

Overall BG&E has taken appropriate action to correct deficiencies in the area of procedures and identification of management goals and expectations. The identification of items that require corrective action has also improved. However, the review process and tracking of these items was fragmented. The process did not ensure consistent review for operability and reportability determinations and prioritization for corrective actions, although staff initiative is in many cases compensating for program weaknesses.

5.0 UNRESOLVED ITEMS

An unresolved item is an item for which more information is needed to determine if the item is acceptable, a violation, or a deviation. Six unresolved items have been opened in this report:

- MOV torque switch controls (Detail 4.2.3.2). (89-81-04)
- Reportability for SDC heat exchanger flow information from June 1988 (Detail 4.2.3.2). (89-81-06)
- Licensee resolution of SDC Hx flow/vibration issues (Detail 3.6 and 4.2.3.2). (89-81-05)
- Three unresolved items related to procedure adherence and corrective actions in the operations area (Detail 4.1). (89-81-01 through 03)

6.0 MANAGEMENT MEETINGS

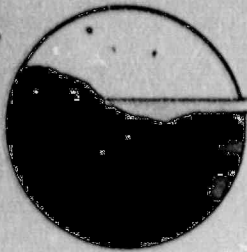
At periodic intervals during the inspection period, the Team Leader held meetings with senior facility management to discuss the inspection scope and preliminary findings. A final exit interview was conducted on November 20, 1989. At the exit meeting, the Team Leader described the preliminary inspection findings, including both the preliminary overall conclusions and the preliminary findings and observations in each functional area. The Team Leader also confirmed licensee commitments at the exit meeting. The Team Leader and Team Manager discussed how the Team findings will be used in NRC deliberations regarding facility restart readiness. The BG&E Vice Chairman and the Vice President (Nuclear Energy) attended along with station management at the General Supervisor and Manager level.

APPENDIX A

Acronyms

BG&E	-	Baltimore Gas and Electric Company
CAL	-	Confirmatory Action Letter
CCI	-	Calvert Cliffs Instruction
CCNPP	-	Calvert Cliffs Nuclear Power Plant
EQ	-	Environmental Qualification
FSAR	-	Final Safety Analysis Report
GS	-	General Supervisor
GSNO	-	General Supervisor Nuclear Operations
HPES	-	Human Performance Evaluation System
HPSI	-	High Pressure Safety Injection
I&C	-	Instrumentation and Control
ISEU	-	Independent Safety Evaluation Unit
IST	-	In-Service Testing
LER	-	Licensee Event Report
LOCA	-	Loss-of-Coolant Accident
MO	-	Maintenance Order
MOV	-	Motor Operated Valve
MR	-	Maintenance Request
NCR	-	Non-Conformance Report
NRC	-	Nuclear Regulatory Commission
OOS	-	Out-of-Service

OSSRC	-	Offsite Safety Review Committee
P&ID	-	Piping and Instrumentation Diagram
PIP	-	Performance Improvement Plan
POEAC	-	Plant Operating Experience Assessment Committee
PM	-	Preventive Maintenance
POSRC	-	Plant Operations Safety Review Committee
PUP	-	Procedure Upgrade Program
QA	-	Quality Assurance
QC	-	Quality Control
RATI	-	Readiness Assessment Team Inspection
SALP	-	Systematic Assessment of Licensee Performance
SAQV	-	Safety Assessment and Quality Verification
SRO	-	Senior Reactor Operator
STI	-	Special Team Inspection 50-317/89-80 and 50-318/89-80
STP	-	Surveillance Test Procedure or Surveillance Test Program
ST	-	Surveillance Test
STA	-	Shift Technical Advisor
TM	-	Temporary Modification
TS	-	Technical Specification
UNR	-	Unresolved Item



Maryland Department of Natural Resources

Tidewater Administration
Tawes State Office Building
580 Taylor Avenue
Annapolis, Maryland 21401

William Donald Schaefer
Governor

Torrey C. Brown, M.D.
Secretary

December 6, 1989

Mr. James T. Wiggins
United States Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406

Dear Jim:

Thank you for the opportunity to participate on behalf of the State of Maryland in the recent Readiness Assessment Team Inspection at Calvert Cliffs. I appreciate the cooperation I received from Randy Blough and other members of the team.

Enclosed is a copy of a memorandum from me to Secretary of Natural Resources Torrey C. Brown. This memorandum represents my report regarding the inspection. As required by the agreement I have signed with the NRC, this report will not be made public prior to the publication of the NRC's final inspection report.

Sincerely,

A handwritten signature in cursive script, appearing to read "Thomas E. Magette".

Thomas E. Magette, Manager
Nuclear Programs

TEM/mpd
Enclosure

Telephone: _____

DNR TTY for Deaf: 301-974-3683



TORREY C. BROWN, M.D.
SECRETARY

JOHN R. GRIFFIN
DEPUTY SECRETARY

STATE OF MARYLAND

DEPARTMENT OF NATURAL RESOURCES
ENERGY ADMINISTRATION

TAWES STATE OFFICE BUILDING
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MEMORANDUM

November 29, 1989

TO: Torrey C. Brown, M.D.
VIA: James C. Peck
FROM: Thomas E. Magette *TEM*
SUBJ: Readiness Assessment Team Inspection at Calvert Cliffs

The information contained in this memorandum was obtained during an inspection of the Nuclear Regulatory Commission. This information is considered by the NRC to be confidential until publication of their inspection report. Under the State of Maryland's agreement with the NRC, this information cannot be made public until that time.

From November 6-17, 1989, the Nuclear Regulatory Commission (NRC) conducted a Readiness Assessment Team Inspection (RATI) at the Calvert Cliffs Nuclear Power Plant. The purpose of the inspection was to evaluate BG&E's readiness to operate Calvert Cliffs safely. This was a performance based inspection, and focused on direct observation of work.

The results of this inspection, regardless of whether or not they were favorable, could not lead to a decision to approve restart of the plant. This is because there are several items currently being addressed by BG&E and/or being separately evaluated by the NRC. These items are thus outside the scope of the RATI. They are evaluations of:

1. BG&E's corrective actions for the 48 restart commitments to the NRC.
2. The physical readiness of the plant for operation.
3. BG&E's corrective action on AOP-9.
4. The adequacy of Operating Procedures.

Favorable reviews of each of these items will be required prior to reaching a decision on restart.

The RATI evaluated performance in three broad areas:

1. Maintenance and Surveillance
2. Operations
3. Quality Assessment/Safety Verification

The area of operations was further broken down into: use of procedures; safety tagging; and control of plant status and activities.

The inspection was conducted by a team of eight NRC inspectors. Of the inspectors, three were head resident inspectors at other Region I plants, one was a resident inspector at another Region I plant, three were from the regional office, and one was a consultant. I accompanied the team during the entire inspection as an observer on behalf of the State of Maryland.

This report presents the results of my observations. My conclusions are in most respects very similar to those of the team. This report is not intended to be a comprehensive discussion of the results of the inspection. The NRC report will adequately serve that purpose. Rather, I have noted those observations which I believe to be most important, and those observations which may differ somewhat from those of the NRC. There are very few items in the latter category.

Within each area inspected the team noted strengths, weaknesses, areas that have shown improvement, and observations. Observations may be either positive or negative, but not significant enough to be considered a strength or weakness. One strength and several areas of improvement, weaknesses, and observations were noted during the inspection. The team also decided whether or not BG&E's performance in each area was adequate to support safe operation of the plant.

The team concluded that within the areas of Maintenance/Surveillance and Safety Assessment/Quality Verification BG&E's performance had improved to the point where it was adequate to support safe operation of the plant with some exceptions. The exceptions are explained in more detail below. Within the area of procedures, the team found that performance in use of procedures and control of plant status and activities was adequate to support safe operation of the plant with exceptions. Performance in the area of safety tagging was found to be inadequate to support safe operation of the plant.

The observations of the team in each of the areas inspected are briefly summarized below.

MAINTENANCE AND SURVEILLANCE

The area of maintenance and surveillance was generally the strongest of the areas inspected. The only strength noted by the team was in this area. The strength was the initiation by BG&E of a Maintenance Supervisory Job Observation Program. This program requires each supervisor in Maintenance to spend approximately one day per month in the plant directly observing ongoing work and to report the results of his observations. The number of supervisors is adequate to provide for daily coverage.

The team noted a weakness in this area regarding BG&E's new Surveillance Test Program. The new program was developed to centralize surveillance tests; however, certain surveillance tests intentionally were not included in the new program. In addition, BG&E did not have in place a mechanism for ensuring that those surveillance tests not included in the centralized program were completed prior to restart. BG&E has committed to revising their procedures to ensure that these surveillance tests are completed prior to restart.

The team also observed that there is a significant number of maintenance tasks which must be completed prior to restart (over 400 at the end of the inspection). BG&E's schedule called for completing physical work by November 15, 1989. The number of open maintenance orders actually increased slightly during the two weeks of the inspection.

OPERATIONS

Safety Tagging

The area of Operations-Safety Tagging was found by the team to be inadequate to support safe operation of the plant. Nonetheless, the team noted significant improvement in this area. Of BG&E's 48 specific commitments, 10 involved improvements in the area of safety tagging. Several were successful in improving performance, most notably, the use of two licensed operators to review tagouts, involvement of the Supervisor of Safety Tagging in planning/scheduling meetings, and the elevation of the tagging unit within the Calvert Cliffs organization.

The team also identified significant weaknesses within the area. These include failure to meticulously administer the program, a lack of management oversight, and a failure to formally track tagout deficiencies. The most serious example of this final weakness was the discovery by the team that BG&E had not conducted since September an audit of tags over 90 days old. This audit is supposed to be conducted monthly. The results of the September audit had not yet been reviewed by management.

BG&E immediately corrected this problem by conducting an audit on Sunday, November 12, 1989. The audit identified approximately 20 deficiencies, most of which were minor in nature. However, one involved the removal of two tags and repositioning of electrical switches in violation of the tags. The team considered this to be a serious deficiency.

The team concluded that the area of Safety Tagging was not ready for this inspection. There was also concern that BG&E's own management review process failed to identify problems in this area. The NRC has asked BG&E to report to them the following:

1. The reasons for the weaknesses
2. The reasons why BG&E management found this area acceptable
3. BG&E's corrective actions
4. BG&E's methods for ensuring acceptable performance prior to follow-up inspection.

Use of Procedures

The team observed clear improvement in this area. There has been significant improvement throughout the plant regarding adherence to procedures. The process for changing procedures and the formality and limits to "pen and ink" changes to procedures are both notable improvements in this area. The team observed that operators are stopping to correct procedure problems. This is a significant improvement over past practice.

The team also noted some weaknesses in this area. One of note was BG&E's failure to meet a commitment regarding the use of General Supervisor, Nuclear Operations' Standing Instructions. The Standing Instructions are used by the General Supervisor, Nuclear Operations (GSNO) to communicate information to the licensed operating crews. The Special Team Inspection (STI) conducted by the NRC last spring noted that several Standing Instructions contained information which should have been contained in formal procedures. Following that inspection, BG&E committed to review all Standing Instructions, remove those which could affect nuclear safety, and incorporate them into appropriate procedures.

BG&E incorporated into procedures those Standing Instructions identified during the STI as important to nuclear safety. They reviewed the Standing Instructions, identified additional instructions containing information which should be in procedures, and incorporated these into appropriate procedures. They failed, however, to remove the instructions from the GSNO Standing Instructions. In addition, the team identified an additional instruction which should have been removed and put into procedures.

Control of Plant Status and Activities

The team noted improvements in this area. They include new plant status aids for the operators, the expanded use of out-of-service tags to label control panels, and the safety review of temporary modifications to the plant. The one weakness in this area also involved temporary modifications. The team noted that not all temporary modifications were controlled in a way that would ensure their review prior to restart. BG&E has committed to correct this.

SAFETY ASSESSMENT/QUALITY VERIFICATION

Three improvements were noted in this area: The Procedure Upgrade Project, supervisory training, and system engineer training. The Procedure Upgrade Project (PUP) is a part of BG&E's Performance Improvement Plan, which the NRC required BG&E to prepare to identify necessary long-term improvements. The PUP will encompass the review of all procedures and rewrite them to meet much higher standards. The PUP is well managed and appears to be well underway.

The team noted several weaknesses in this area, many regarding the Plant Operations and Safety Review Committee (POSRC). The POSRC exists to advise the Plant Manager of all matters related to nuclear safety. Because the composition, function, responsibilities, and authority of the POSRC are established by the plant's Technical Specifications, strict compliance is a regulatory requirement. The team identified the following weaknesses regarding POSRC:

1. POSRC's structure and relationship to line management
2. The delegation as alternate POSRC Chairman and the delegation of Plant Manager signature authority to the General Supervisor, Quality Assurance without provision to remove him from his Quality Assurance function
3. Excessive use of alternates in meetings
4. Unacceptably high number of POSRC open items.

At the time of the RATI, there were over 200 POSRC open items, 74 of which were overdue. BG&E has committed to review all POSRC open items prior to restart.

The team also noted a weakness regarding how BG&E reviews problems to determine if and when they must be reported to the NRC. The final review of such items is conducted by the Licensing section at Calvert Cliffs. The inspection found the licensing reviews to be ineffective at determining reportability.

OVERALL

The team noted a clear increase in awareness of the importance of and adherence to procedures. The entire organization is also more sensitive to identifying problems.

The team also noted two serious generic weaknesses. The first is that BG&E has no single process for tracking and resolving routine problems. Many problems which are identified are dealt with informally rather than via any specific system. Those problems which are addressed formally may be handled by one of several different systems. A single, formal tracking system is important to ensure that all problems are treated consistently, reviewed for reportability (to the NRC), and corrected. Finally, corrective actions must be verified as complete and effective.

BG&E has committed to implement a formal tracking system prior to restart.

The second generic weakness identified by the team is BG&E's problem in communicating with the regulator. This problem was manifested in several ways both before and during the inspection. One key example was BG&E's failure to have senior management available for the inspection. Several Managers and General Supervisors (the two levels of management immediately below the Vice President Nuclear Energy) were sporadically present during the early part of the inspection. More importantly, the Plant Manager was out of town for the entire RATI. While his absence had been previously scheduled, the NRC was not so notified until arriving onsite November 6 to begin the inspection. It is critical to an inspection such as the RATI that senior management be available during the inspection.

Another example is what the team described as BG&E's fixation on the list of 48 commitments to the NRC. It is obviously important for any licensee to keep commitments it makes to the NRC. BG&E has been faulted by the NRC in the past for weaknesses in keeping commitments. However, the NRC also requires each licensee to make productive commitments, and to revise those which prove to be unworkable or ineffective.

The team identified one commitment which was particularly weak. This commitment entailed illustrating equipment tagged out of service on piping and instrumentation drawings. It was apparent that the commitment was not accomplishing its objectives. This was evident by the failure of the tagging staff to properly maintain the drawings (errors were found on all 4 sets of drawings reviewed), and the lack of use of the drawings by the Shift Supervisors.

BG&E's own verification process (the process by which they confirmed to themselves that their commitments had been successfully accomplished) identified this commitment as being ineffective over two months ago. Yet at the time of the inspection, BG&E stated only that they were continuing to evaluate this approach.

Another example of BG&E's inability to communicate effectively with the regulator was their failure to understand the scope and intent of the RATI before requesting it. BG&E did not expect, nor were they prepared to undergo, a comprehensive, performance based inspection. Rather, they anticipated only an inspection narrowly focused on their implementation of the 48 commitments.

The team also noted that BG&E requested the RATI before some new programs had been in place long enough to become fully effective. The team observed programs that it believed would become effective for solving problems, but was in the position of inspecting them before this could be conclusively demonstrated. I believe this is one of the reasons why so few strengths were found in spite of the large number of improvements BG&E has made.

ROOT CAUSES

The issue of root causes was not addressed in detail during the inspection. It is fundamentally important, however, because BG&E must appropriately identify the sources of their problems before they can solve them. This is a restart issue because the NRC's May 25, 1989 Confirmatory Action Letter requires BG&E to "...determine and correct the root cause(s) of the problems..."

BG&E has addressed the issue of root causes in two separate ways. The Performance Improvement Plan (PIP), which they were required by NRC to prepare to describe long-term improvements, identifies 11 root causes. The NRC's review of the PIP is ongoing and is not expected to be completed prior to restart. BG&E also identified root causes in each of the reports addressing their 48 restart commitments. These reports (or "close-out" packages) are still being reviewed by NRC resident inspectors at Calvert Cliffs.

At the time of the RATI, there was no single list of root causes which addressed the CAL requirement. In response to a question from the team, BG&E prepared a brief paper which specifically addressed root causes in the context of the CAL. This paper was not available, however, until the final day of the inspection. BG&E concluded that the root causes listed and described in the PIP (the root causes of the problems requiring long-term correction) are the same as those for the short-term problems listed in the CAL. Thus, that portion of the PIP addressing root causes is germane to restart.

The NRC has not formally commented on BG&E's root cause analysis. They have suggested that an additional root cause should be added to BG&E's list. This additional root cause is Inadequacy of Procedures. I consider the issue of whether or not BG&E has appropriately identified root causes to be open.

STATUS

As stated above, the information gathered by the NRC and reported herein is predecisional. It is therefore subject to change pending review by NRC management. No substantive change is anticipated, however, because senior management has been briefed on these results.

The commitments made by BG&E during the inspection must be confirmed in writing to the NRC, including dates by which they will be completed.

The NRC has not determined how the open items, both from this inspection and from areas not covered by this inspection, will be closed out. Additional inspection will be required. This may come in the form of inspection by resident inspectors, Region I specialists, or another team inspection.

TEM/mpd

cc: James M. Teitt
Paul Massicot
Larry Ward, MDE