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Mr. J. T. Beckham, Jr.
Vice President, Nuclear Generation
Georgia Power Company
P.O. Box 4545
Atlanta, Georgia 30302

Dear Mr. Beckham:

SUBJECT: REVIEW OF THE EDWIN I. HATCH, UNITS 1 AND 2 DETAILED CONTROL ROOM DESIGN REVIEW PROGRAM PLAN

In accordance with the requirements of Supplement 1 to NUREG-0737, Georgia Power Company (GPC), by letter dated October 23, 1984, has submitted a Program Plan for conducting a Detailed Control Room Design Review (DCRDR) of Units 1 and 2 of Hatch. The NRC staff and its technical assistance contractor, Science Applications International Corporation (SAIC), have reviewed the Hatch Program Plan with reference to the requirements of Supplement 1 to NUREG-0737 and the guidance contained in Section 18.1 of the Standard Review Plan. Our comments on the Program Plan and attached SAIC evaluation are enclosed.

The Program Plan submitted by GPC indicates a good understanding of the DCRDR requirements and the intent by GPC to satisfy those requirements. The staff and its contractor have identified some elements of the plan for which additional clarification will be needed. The means for obtaining this information (e.g., meeting in Bethesda, in-progress site audit) will be discussed with GPC in a telephone conference to be arranged through the NRC Project Manager.

Sincerely,

*ORIGINAL SIGNED BY
JOHN F. STOLZ*

John Stolz, Chief
Operating Reactors Branch #4
Division of Licensing

Enclosure:
As stated

cc w/enclosure:
See next page

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GRivenbark;cf	JStolz
1/24/85	1/24/85

Hatch 1/2
Georgia Power Company

50-321/366

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Enclosure

NUCLEAR REGULATORY COMMISSION
STAFF COMMENTS
ON THE
PLANT HATCH NUCLEAR PLANT, UNITS 1 AND 2
DETAILED CONTROL ROOM DESIGN REVIEW
PROGRAM PLAN

BACKGROUND

Licensees and applicants for operating licenses shall conduct a Detailed Control Room Design Review (DCRDR). The objective is to "improve the ability of nuclear power plant control room operators to prevent accidents or cope with accidents if they occur by improving the information provided to them" (NUREG-0660, Item I.D.). The need to conduct a DCRDR was confirmed in NUREG-0737 and Supplement 1 to NUREG-0737. DCRDR requirements in Supplement 1 to NUREG-0737 replaced those in earlier documents. Supplement 1 to NUREG-0737 requires each applicant or licensee to conduct a DCRDR on a schedule negotiated with the Nuclear Regulatory Commission (NRC).

NUREG-0700 describes four phases of the DCRDR and provides applicants and licensees with guidelines for its conduct. The phases are:

1. Planning
2. Review
3. Assessment and implementation
4. Reporting

Criteria for evaluating each phase are contained in Section 18.1, Rev. 0, of NUREG-0800, (Standard Review Plan) and Appendix A to Section 18.1.
A Program Plan is to be submitted within two months of the start of the DCRDR. Consistent with the requirements of Supplement 1 to NUREG-0737, the Program Plan shall describe how the following elements of the DCRDR will be accomplished:

1. Establishment of a qualified multidisciplinary review team

2. Function and task analyses to identify control room operator tasks and information and control requirements during emergency operations

3. A comparison of display and control requirements with a control room inventory

4. A control room survey to identify deviations from accepted human factors principles

5. Assessment of human engineering discrepancies (HEDs) to determine which are significant and should be corrected

6. Selection of design improvements

7. Verification that selected design improvements will provide the necessary correction

8. Verification that improvements will not introduce new HEDs

9. Coordination of control room improvements with changes from other programs such as the safety parameter display system, operator training, Reg. Guide 1.97 instrumentation, and upgraded emergency operating procedures

Licensees and applicants are expected to schedule Element 1 for accomplishment during the planning phase, Elements 2 through 4 for accomplishment during the review phase, and Elements 5 through 8 for accomplishment during the assessment and implementation phase. Scheduling of Element 9 is expected to cut across the planning, review, and assessment and implementation phases.

Program plans are not approved by the NRC, but staff comments will be provided per the requirements of Supplement 1 to NUREG-0737. These comments will, among other things, provide the staff's judgment as to whether the Program Plan will result in a successful DCRDR. Staff comments on the Program Plan do not require formal response.

A Summary Report is to be submitted at the end of the DCRDR. As a minimum it shall:

1. Outline proposed control room changes
2. Outline proposed schedules for implementation
3. Provide summary justification for HEDs with safety significance to be left uncorrected or partially corrected

The NRC will evaluate the organization, process, and results of the DCRDR. Evaluation will include review of required documentation (Program Plan and Summary Report) and may also include reviews of additional documentation, briefings, discussions, and on-site audits. In-progress audits may be conducted after submission of the Program Plan but prior to submission of the Summary Report. The staff will prepare a report following an in-progress audit. That report will be transmitted to licensees and applicants for their use. Pre-implementation audits may be conducted after submission of the Summary Report. Results of a pre-implementation audit will be included in the NRC evaluation of the DCRDR which follows receipt of the Summary Report. NRC evaluation will be in accordance with the requirements of Supplement 1 to NUREG-0737. Additional guidance for the evaluation is provided by NUREG-0700 and Section 18.1, Rev. 0, of the Standard Review Plan.

Supplement 1 to NUREG-0737 requires that significant HEDs be corrected. Improvements which can be accomplished with an enhancement program may be done promptly. Other control room upgrades may begin following publication of the SER (or SER Supplement), resolution of any open issues, and approval of a schedule for upgrade.

Evaluation of the design of the remote shutdown capability provided to meet 10 CFR Part 50, Appendix A, GDC-19 and 10 CFR Part 50, Appendix R is not specifically identified as a requirement in Supplement 1 to NUREG-0737. However, the NRC staff recommends that the scope of the DCRDR include a human factors evaluation of the design of the remote shutdown capability. To the extent practicable, without delaying completion of the DCRDR, the NRC staff also recommends that the DCRDR address any control room modifications and additions (such as controls and display for inadequate core cooling and reactor system vents) made or planned as a result of other post-TMI actions, as well as the lessons learned from operating reactor events such as the Salem ATWS events. Implications of the Salem ATWS events are discussed in NUREG-1000 and required actions are described in Section 1.2, "Post Trip Review - Data and Information Capability," of the enclosure to Generic Letter 83-28.

DISCUSSION

Georgia Power Company (GPC) submitted, by letter dated October 23, 1984, a Program Plan for conducting a DCRDR at Plant Hatch Units 1 and 2. The Program Plan was reviewed against the requirements of Supplement 1 to NUREG-0737 by the staff and its consultants from Science Applications International Corporation (SAIC). Discussion of each of the required elements of the DCRDR and SAIC's conclusions and recommendations to the staff are contained in the attached SAIC report. In general, the staff concurs with SAIC's conclusions as discussed below.

CONCLUSIONS

The licensee's Plan for conducting a DCRDR at Hatch demonstrates an understanding of most areas required for a successful review. No major, unresolvable obstacles to conducting a DCRDR which meets NRC requirements are foreseen if the review is conducted as outlined in the Program Plan. In several areas, however, the plan provides insufficient detail to allow definitive judgments about the efficacy of the planned approach. Additional information or clarification will be needed before the staff can make any final judgments. The most important areas where additional information will be needed concern:

- the level of effort and task responsibilities assigned to the various disciplines represented on the DCRDR team,
- the scope of the task analysis and the comprehensiveness of the identification of information and control needs, i.e., "relevant characteristics,"
- clarification of the uses of the simulator in verification and validation activities, fidelity of simulation, and differences between the simulator and the Unit 1 and 2 control rooms, and
- HED assessment methods.

REFERENCES

NUREG-0660, "NRC Action Plan Developed as a Result of the TMI-2 Accident," May 1980; Revision 1, August 1980.

NUREG-0700, "Guidelines for Control Room Design Review," September 1981.

NUREG-0737, "Clarification of TMI Action Plan Requirements," November 1980; Supplement 1, December 1982.

NUREG-0800, "Standard Review Plan," Section 18.1, Rev. 0, September 1984.

NUREG-1000, "Generic Implications of ATWS Events at the Salem Nuclear Power Plant," April 1983.

Generic Letter 83-28, "Required Actions Based on Generic Implications of Salem ATWS Events," July 8, 1983.

Attachment to letter from L. T. Gucwa to J. F. Stolz, "Detailed Control Room Design Review Program Plan," October 23, 1984.

ATTACHMENT 1

Science Application International Corporation

Program Plan Evaluation: Plant Hatch

DCRDR Program Plan Evaluation
for the Georgia Power Company
Plant Edwin I. Hatch
Units 1 and 2

Science Applications International Corporation (SAIC) has evaluated the program plan for conducting a Detailed Control Room Design Review (DCRDR) submitted by the Georgia Power Company (GPC) for Plant Edwin I. Hatch. The purpose of the evaluation was fourfold: (1) to determine whether the plan would lead to a successful review; (2) to recommend to NRC whether a meeting with utility representatives or an in-progress audit should be conducted; (3) to provide a meeting or audit agenda where appropriate; and (4) to provide a basis for constructive feedback to the Georgia Power Company. The requirements set forth in NUREG-0737, Supplement 1, "Requirements for Emergency Response Capability," December 1982 (Reference 2) served as a basis for the evaluation. The specific document reviewed is listed as Reference 1.

The program plan submitted by GPC for evaluation consists of 61 pages devoted to description of previous and planned DCRDR activities and related activities, past and planned. In addition, a bibliography is furnished along with two appendices. The document is divided into six major parts. Part 1, the Introduction, includes background information, a statement of the purpose of the DCRDR, its scope, a flowchart of DCRDR activities and schedule of those activities. Part 2, Management and Staffing, provides descriptions of the management review process, structure of the review team, qualifications of the review team, and the integration of NUREG-0737, Supplement 1 activities and related human factors programs. Part 3 is devoted to DCRDR documentation and document control. Part 4 describes review procedures which include: Operating Experience Review, Control Room Survey, Systems Function Review and Task Analysis, Verification of Instrumentation and Controls, and Validation of Control Room Functions. Part 5 describes HED assessment and resolution and addresses HED categorization, resolutions and implementation. Part 6, DCRDR Final Report and Future Applications, very briefly discusses the Final Report, verification that selected design improvements do not introduce new HEDs, and integration with related Supplement 1 to NUREG-0737 items. Appendix A provides a glossary of terms while Appendix B contains resumes of some of the DCRDR participants.

In summary, the licensee has provided information which seems to demonstrate an overall understanding of and commitment to the requirements for a successful DCRDR. Additional information is needed in some areas before a decision regarding the efficacy of the proposed review can be made. The strengths and weaknesses of the program plan, as submitted, are discussed in the following sections.

1. Qualifications and Structure of the DCRDR Team

The program plan states that the GPC Plant (Hatch) General Manager will be ultimately responsible for the conduct of the DCRDR while the GPC Review Team Leader will be responsible for the day-to-day conduct of the DCRDR activities. Further, the Review Team Leader will provide a monthly briefing to the plant General Manager regarding the progress of the DCRDR to assure management attention, to ensure DCRDR objectives are being met and that the efforts are integrated with overall emergency response improvements. The management relationship is shown in Figure 2-1 of the program plan (p. 2-4).

A General Physics (GP) Project Manager/Human Factors Specialist and a GPC Operations Specialist are shown (Figure 2-1) at the next management level and apparently report to the DCRDR Review Team Leader. The figure then shows the hierarchical position and identifies the titles of the support members. The text mentions a GP Project Director, but his position in the team structure is not indicated. In addition, a DCRDR Project Manager is mentioned later in the text as the final arbiter for HED resolution, but this position is not shown on Figure 2-1. It would seem that these two positions would be intimately involved in the conduct of the DCRDR, but how and where they fit into the team organization is not clear.

In connection with the organization chart, it would have been most helpful if the positions shown were associated with a name. Neither the chart nor the accompanying text (except on two resumes) identifies a person with a position. The information, as presented, left the reviewers with no choice but to review the resumes in Appendix B and to then assume what positions would be filled by which people.

The program plan provides a general description of the kinds of activities the review team and its support personnel will participate in. This section would have been stronger if task assignments had been specified and estimated levels of individuals' efforts provided.

There is no question, however, that a multidisciplinary team has been organized, authority provided to ensure freedom of review team operation, arrangements made for free access to all required sources of assistance/ information, and freedom provided for team members to document dissenting opinions. Therefore the requirement in NUREG-0737, Supplement 1 has been fulfilled to a great extent. However, information responding to the concerns expressed above is needed to assure us that the appropriate disciplines with the proper level of involvement are assigned to each of the DCRDR activities.

2. Function and Task Analysis

The planned System Function Review portion of the System Function Review and Task Analysis procedures has been presented in a straightforward and logical fashion in the program plan. Relative to the definition of representative scenarios, the program plan states: "The BWR Owners Group Procedure Guidelines and the list of Hatch safety-related systems will be used to define a set of scenarios which will adequately sample various emergency conditions and the plant systems and system functions used in these conditions." However, if this had read, "the list of **all** Hatch safety-related systems ...," one could feel more confident of GPC's sampling adequacy. Confidence that all safety-related functions would be exercised could be reinforced if a more specific description (details regarding the scenarios to be selected) were provided.

The program plan states that "residual unique operator tasks required for the shutdown of the plant during emergency conditions and from the Hatch specific EOPs but not covered in the scenarios will be identified and later analyzed for associated information and control requirements ... in order to ... ensure that all operator interfaces required for safe shutdown during emergency conditions have been examined even if those interfaces are not exercised in the sample of emergency scenarios selected for validation of control room functions" (p. 4-12). It is not clear what these "residual

unique operator tasks" may be and why such tasks, if they are from the Hatch specific EOPs, are not covered in the scenarios and will be addressed separately and later. No matter how GPC may define and address "residual unique operator-tasks," it must ensure that all emergency-related tasks are covered by the task analysis.

In its definitions of the fields (i.e., columns) that appear on the task analysis worksheet, GPC defines the information and control requirements that will be noted in this column as "(1) the system involved, (2) the parameter, component in procedure needed and (3) the relevant characteristics of the parameter or component referenced for the operator to execute the task" (p. 4-15). Two concerns arise from this definition: (1) when GPC uses the word "component," does this include a plant-specific component called out in the EOPs and (2) how comprehensive is the needed "relevant characteristics" of the parameter or component needed. If GPC is referring to the identification of plant-specific components during the determination of information and control requirements, then this approach will potentially bias the subsequent verification of I&C availability and thus render both the task analysis and verification activity invalid. In addition, GPC does not specify what "relevant characteristics" will be identified. The "Information & Control Req." column of the Task Analysis Worksheet appears to be too small to allow a comprehensive list of needed characteristics to be recorded. A form the size of that used and formatted for the actual equipment characteristics (Figure 4-5, p. 4-19) in the control room would be more appropriate. Discussion on the Equipment Characteristics form is given in the Control Room Inventory section of this report. The overall concern which GPC should respond to, however, is not the form's provision for space to record the relevant characteristics but what characteristics will actually be defined as information (parameter) and control requirements.

Despite some lack of detail and the areas of concern addressed above, the System Function Review and Task Analysis procedures appear to be quite satisfactory in general. We believe GPC's intent to derive information and control requirements independently of the actual I&C in the control room is a positive step towards meeting the function and task analysis requirement of NUREG-0737, Supplement 1. However, in order for us to fully evaluate the adequacy of its System Function Review and Task Analysis, GPC should provide information which responds to the concerns raised above.

3. Control Room Inventory

To meet the NUREG-0737, Supplement 1 requirement for comparing information and control requirements with a control room inventory, GPC will apparently be comparing the Task Analysis Worksheet column "Information and Control Req." with the columns entitled "means" and "I&C Ident." (also in the Task Analysis Worksheet p. 4-14) and the information written in the Equipment Characteristics form (p. 4-18). This comparison is described in the Verification of Instrumentation and Control (I&C) section of the program plan (p. 4-21). The "paper" comparison will be performed in conjunction with on-site inspection and/or review of scenario videotapes (see discussion in this report on Validation of Control Room Functions). The program plan indicates that the suitability review will be conducted by a human factors engineer, operations expert, and an I&C engineer (p. 4-22). As mentioned previously, the lack of identification (i.e., names) of who will conduct this effort leaves the reviewers with no idea of the degree of expertise or the time to be devoted to this review.

In the control room, the means by which the instrumentation and controls are presented (i.e., switches, meters, etc. on the control boards), their location, and the equipment numbers will be documented in the Task Analysis Worksheet, the Equipment Characteristics form, and the Equipment Suitability HEDs form. For each I&C item listed, its actual characteristics will be noted on the Equipment Characteristics form (Figure 4-5, p. 4-19). At this point there is some question as to the utility of the last two columns on the Equipment Characteristics form. It is not apparent what characteristics of displays and controls will be included in these columns. It appears that considerably more detail is needed in the "Control" column in order to comprehensively list all control characteristics. Also, the display column "Units/type" is somewhat ambiguous. These ambiguities, in addition to the concerns raised in the discussion of the information and control requirements to be recorded on the Task Analysis Worksheet, should be clarified by GPC before a conclusion on the adequacy of these processes is made.

The presence or absence of all the required information and controls determined from the task analysis will be established in the verification of I&C availability activity. Any absence will be documented as an HED.

The program plan states that a separate review of the I&C identified above will be done to ensure direct versus indirect indications of parameters. More information needs to be provided regarding when and how this will be done and how the results of this review will be integrated into the data regarding availability and suitability.

The Validation of Control Room Functions (p. 4-23 of the program plan) will involve scenario exercises to evaluate the operational aspects of control room design in terms of, "control/display relationships, display grouping (the reviewers feel this should be control and display grouping), visual and communications links, manning levels and traffic patterns. To arrive at these determinations the program plan indicates that real-time scenario exercises will be run on the Hatch simulator as part of GPC's EOP Verification and Validation effort and that exercises relevant to the DCRDR will be videotaped. Additionally, DCRDR team members will use the partially completed Task Analysis worksheets to record their observations. GPC states that walk-throughs will be performed on those scenarios which cannot be performed on the simulator. Operators will be asked to note any errors or problems that may be encountered during the real-time scenario exercises.

The reviewers have some doubts regarding the adequacy of the validation activities as planned for the following reasons:

- The effectiveness of the validation depends heavily on the fidelity (not specified) of the simulators.

- There is no explanation of how and where scenarios not performed on the simulator will be conducted.

- In real-time exercises things may happen too fast for the observers to follow and record.

- Videotaping has not proved a really effective tool when compared to a slow walk-through and does not easily lend itself to evaluation of control/display relationships, I&C groupings, etc.

- There is some doubt concerning the adequacy of videotapes for providing other than supplementary means for verifying instrument

and control availability and as any means for verifying instrument and control suitability (p. 4-24).

- Asking operators to expound on errors and problems encountered during a real-time exercise after the exercises have been conducted counts too heavily on recall ability of persons doing the job at hand.

We suggest that slower than real-time exercise of scenarios be considered to increase observer accuracy/completeness so that stops can be made and problems encountered explained/discussed to avoid the necessity for depending on operator recall.

In summary, the procedure for assuring the availability of required I&C appear to be adequate with reference to this NUREG-0737, Supplement 1 requirement. However, the adequacy of the Equipment Characteristics worksheet for providing a comprehensive data base of actual display and control characteristics for performing a verification of I&C suitability and the procedures proposed for the validation of control room functions cannot be evaluated until more information is provided.

4. Control Room Survey

The program plan indicates that a two-day human factors orientation for the review team will be conducted prior to commencement of the Control Room Survey. This portends a good approach to strengthening the validity of the survey, provided the orientation will be concentrated on the Control Room Survey. There is however, no indication who, in either the core review team or among support personnel, will attend the workshop or what their respective duties/ responsibilities will be during the survey.

The program plan has provided a description of the 1981 BWROG Control Room survey methodology in which it has identified the areas encompassed and explains the scoring scheme for determining degree of compliance. The NRC's review of the BWROG Control Room Survey Program (Generic Letter 83-18) found that the survey checklists, such as those used in the 1981 BWROG control room survey, only partially fulfilled the Control Room Survey requirement of NUREG-0737, Supplement 1. One of the activities the individual plants were

expected (by the NRC) to conduct to fulfill the control room survey requirement was to complete the BWROG control room survey Checklist Supplement. GPC states that the 1981 BWROG control room survey will be updated for the Hatch control room during the DCRDR using the 1983 BWROG Supplement Checklist. GPC also states that the results of the 1981 survey will be integrated into the current DCRDR and tracked. The 1983 BWROG Survey Methodology description does not make it clear whether the methodology to be used is the same as that used and found to be acceptable (by the NRC) for the 1981 control room survey. Part of the methodology for performing the 1981 (and possibly 1983) checklists was to determine a particular panel's degree of compliance towards each criterion. The degree of compliance appears to be defined as the number of components on the panel that are compliant with the criterion. GPC states that "If, for example, a large number of components are reviewed and only a few were non-compliance, these were specifically noted in the comment space and the general rating was "mostly compliance." A concern which arises from this checklist methodology and should be addressed by GPC is how it documented and kept track of components that were identified as non-compliant to a criterion that received the general rating "mostly compliant." GPC must provide assurance that it has and will keep track of components involved in discrepancies located on panels which received a general rating of "mostly compliant" or worse.

In addition to the lack of a clear description of the 1983 survey methodology, GPC does not indicate the kinds of disciplines and levels of effort involved to perform the survey effort. In order for the reviewers to make any judgment as to the degree of effectiveness of the proposed survey methodology and staffing, GPC should provide information which responds to the concerns discussed above.

5. Assessment of HEDs

In Section 1 of this evaluation it is stated that the reviewers assumed (by reviewing resumes) which persons would occupy which positions. Mr. Lewis was assumed to occupy the position of Operations Specialist, Mr. Midlik was assumed to occupy the position of I&C Engineer (and DCRDR Team Leader) and Mr. Stamm was assumed to occupy the position of Systems Design Engineer. These particular three positions were described in Part 2 of the

program plan as having some responsibilities in connection with the assessment and resolution of HEDs. None of the men occupying these positions, according to their resumes, have any background in human factors. The DCRDR Project Manager, who has a key role in HED resolution, is not identified in the program plan nor are his qualifications provided. The program plan says that human factors specialists will assist utility personnel in assessing HEDs but who they will be, what qualifications they will have and to what degree they will participate is not mentioned. GPC should provide documentation addressing these concerns in the proposed staffing of the proposed HED assessment and resolution approach.

The program plan, relative to evaluation of HEDs' contribution to operator error, indicates that in considering answers to the questions in Table 1 (pp. 5-3 and 5-4) the evaluators will consider such other performance shaping factors as: training, operator experience, procedure adequacy, and situational requirements. Will there be a consensus among the evaluators as to the weight to be given each of these factors? Will there be a consensus regarding what constitutes procedure adequacy and situational requirements? When will Plant Hatch control room conventions be established and identified? Will there be a standard method for scoring the answers to Table 1 questions? If answers to the Table 1 questions depend entirely upon the evaluators' judgments, the reviewers feel a great disparity in evaluations could result. On the other hand, the categorization process described later in the program plan (p. 5-8) may act as a leveling tool and result in a better final categorization which benefits from varying inputs. This portion of the HED assessment approach should be explored in future discussions with GPC.

The program plan indicates that Category I, II, and III HEDs will be given priority in the course of the HED resolution process and this appears to be a sound approach. It also says that resolution of Category IV HEDs is optional and will depend on the nature and complexity of the discrepancy. The meaning of the terms "nature and complexity" is not clear. If this means consideration and analysis of the possibility that an innocuous Category IV HED, left unresolved, could cause a specific error which, in turn, could lead to an error of significant consequences or whether two or more Category IV HEDs could, by their cumulative effects, result in an operator error(s) of a significant nature, then this meaning is adequate. GPC

should, however, make it clear that such possibilities will, in fact, be considered during the HED categorization process and that any conventions for color, labeling, and so on are kept consistent in the control room regardless of the categorization of related HEDs.

When the listing of HEDs and associated recommendations are forwarded for evaluation by GPC engineering and operations personnel it should be definitely understood that their output must be limited to "how to" and not to "whether to." During the evaluation by the GPC operations and engineering personnel they should be assisted by human factors personnel in answering questions; 1, 2, 6, 7 and 8 of Table 5 (pp. 5-11). We believe that these questions can only be answered adequately with the assistance of persons possessing human factors expertise.

The implementation of HED resolutions will give priority to Category I, II, and III HEDs. Those improvements that can be accomplished with an enhancement program (paint-tape-label) will also be scheduled for prompt implementation. However, care in scheduling must be taken to ensure that all improvements be integrated/coordinated beforehand with design changes and other more significant, proposed modifications.

Noteworthy features in the proposed assessment procedures are:

- Review team members will have the opportunity to review each others' HED assessments.
- HED categorization comes via consensus of evaluators.
- Any evaluator is free to present a dissenting opinion.
- Information copies of Categories I, II, and III HEDs, with DCRDR recommendations for resolution, will be presented to GPC management.
- Team members are free to propose alternative solutions and the basis for their choice.

- The final list of HEDs and planned corrections will be the result of several iterations of review.

As there have been concerns noted in our review of the proposed HED assessment and resolution activities, we believe further discussion on these topics is necessary before conclusions on the adequacy of GPC's plans can be made relative to NUREG-0737, Supplement 1 requirements.

6. Selection of Design Improvements

Since GPC's plans or methodology for selection of control room improvements is addressed in conjunction with the assessment methodology, comments concerning the proposed resolution methodology have been discussed in the Assessment of HEDs section of this report.

7. Verification that Improvements will Provide the Necessary Correction

The program plan describes the procedures for verification of instruments and controls, establishment of instrument and control suitability, validation of control room functions, and resolution of HEDs. The resolution of HEDs, as described (pp. 5-8 and 5-10), shows that the various utility departments, GPC management, as well as the DCRDR team all examine the proposed corrections in light of the improvements they will effect. The fact that planned HED corrections go through many iterations during their development further indicates that adequate time and thought will be devoted to assuring the efficacy of the proposed improvements. While the program plan submitted by the licensee presents no distinct/identifiable plan for verification that improvements will serve their intended purpose, the reviewers feel that GPC's intentions for meeting this NUREG-0737, Supplement 1 requirement are adequate. Conclusions concerning the adequacy of GPC's plans for performing this activity should await the submission of the Summary Report which GPC states will contain the planned methodology.

8. Verification that Control Room Modifications Do Not Introduce New HEDs

Verification that proposed control room improvements will not introduce new HEDs is implicit in the procedures mentioned in Section 7 above. Concern regarding assurance that proposed control room modifications will not

degrade operator performance (p. 5-10, Section 5.2.2.1) or introduce new HEDs (p. 5-8 and 5-11) is specifically noted in the program plan discussions of HED resolution and proposed corrective action evaluation. The licensee is obviously well aware that there must be no new problems created anywhere in the control room as a result of proposed improvements in specific areas. The licensee states that a plan to verify that proposed control room modifications will not produce new HEDs will be provided in the final report. We believe GPC's intentions towards meeting this NUREG-0737, Supplement 1 requirement are satisfactory. However, conclusions regarding the adequacy of the methodology, which will be presented in the Summary Report, could not be made at this time.

9. Coordination of the DCRDR With Other Improvement Programs

The licensee indicates that the utility has commenced and will continue to implement other required control room improvement programs. An overall plan for coordination of other improvement programs is not specifically identified nor is the person or organization in charge of the coordination of other improvement programs with the DCRDR identified. However, the following improvement programs were described in the program plan (pp. 2-6 to 2-12) and are commented on:

- Initial work on development of an SPDS for Plant Hatch was commenced in 1981 and while SPDS information will be considered during the DCRDR task analysis, the task analysis will come too late to incorporate any results into SPDS design. Since installation of the SPDS will not occur until mid-1985, we recommended that the location of the SPDS undergo a human factors review.

- The program plan states that symptom-based EOP implementation for Plant Hatch will be consistent with the requirements of NUREG-0737, Supplement 1. It also notes that the Verification and Validation (V&V) phases of the DCRDR address some of the concerns which must be addressed in the EOP upgrade (NUREG-0899) and therefore, the V&V phases of the DCRDR will be done in conjunction with the V&V for the EOP upgrade (p. 2-8). GPC states that the upgraded EOPs have been integrated with the SPDS by use of task footnotes that alert the operator to the related SPDS display.

- The program plan explains that completed Regulatory Guide 1.97 modifications will be handled by DCRDR activities in the same manner as other control room equipment. The portion of the DCRDR execution phase that will be integrated with ongoing Reg. Guide 1.97 modifications is verification of I&C (p. 2-9). If there are any Reg. Guide 1.97 associated modifications which are not yet installed, these planned modifications should be integrated into the DCRDR task analysis, control room survey, V&V, HED identification as may be necessary, etc.

- Any Emergency Response Facilities activities associated with the control room will be integrated into the DCRDR as appropriate. GPC states that no integration with the DCRDR other than the evaluation of communications equipment is envisioned (p. 2-10).

- GPC states that a previous (1981) Plant Hatch Control Room Survey was performed by a BWROG survey team. The control room environment and annunciator system has been modified due to the 1981 survey. GPC states that all findings from the 1981 survey will be integrated into the current DCRDR and tracked (p. 2-11).

- The program plan also states that INPO NUTAC guidelines will be used in the DCRDR project and provide additional detail to the review phase activity procedures. The program plan does not clarify in what areas of the DCRDR project, other than procedural description of review phase activities, the NUTAC guidelines will be used.

The program plan states "The HED resolution phase of the DCRDR will involve the integration of the EOP's, SPDS, Training, Regulatory Guide 1.97, previous work and other planned future control room changes. The resolution of HED's might necessitate revisions to the EOP's or to the SPDS displays. For example, HED's that cannot be easily corrected due to conflicting requirements can be explicitly flagged in the upgraded EOP's. Missing or inappropriately located information that is identified during the DCRDR could be displayed on the SPDS. Missing instrumentation or inappropriate instrument ranges will be compared to Regulatory Guide 1.97. HED resolu-

tions will be factored into the appropriate training material as part of the integrated training program for NUREG-0737, Supplement 1 activities." (p. 2-12)

In summary, GPC has demonstrated its awareness of and intention to coordinate other improvement programs with the DCRDR. However, the entity responsible for providing the integrating function should be described along with the mechanism or procedure for performing this function.

Conclusions and Recommendations

The licensee has submitted a program plan for conducting a DCRDR at the Plant Edwin I. Hatch, Units 1 and 2. The program plan demonstrates an understanding of most areas required for a successful review. Further information however, is required regarding Review Team personnel, their positions, specific task assignments and individual levels of effort before we can be confident that all the tasks associated with a DCRDR will be satisfactorily carried out. In addition, more information is needed before we can determine the efficacy of the DCRDR activities. We therefore recommend a meeting be held between the NRC and GPC representatives to provide further detailed information. A meeting agenda is presented below which details the areas we believe need further clarification.

Suggested Agenda

- Qualifications and Structure of the DCRDR Review Team
  - identification of personnel with specific position assignments
  - specific task assignments and levels of effort

- Function and Task Analysis
  - additional detail on the specific scenarios
  - verification that all safety functions will be analyzed
  - more detail on residual tasks and their analysis
  - analysis of tasks for determining information and control requirements

- Control Room Inventory
  - further explanation of the content and use of the Task Analysis work sheet and associated forms (Information and Control Requirement Sources, Equipment Characteristics, Equipment Suitability HEDs)
  - more detail, clarification of control room function validation activities/methodologies

- Control Room Survey
  - human factors orientation workshop - course content and areas of emphasis
  - identification of workshop attendees and their survey responsibilities
  - methodology, procedures

- Assessment of HEDs
  - who evaluates HEDs
  - evaluation methodology (standardization) for operator error and plant safety HEDs
  - evaluation scoring schemes
  - consideration of cumulative/interactive effects of all HEDs, primarily Category IV HEDs
  - scheduling and integration of HED resolutions

- Verification That Improvements Will Provide the Necessary Correction; Methodology

- Verification That Control Room Improvements Will Not Introduce New HEDs; Methodology

- Coordination of the DCRDR With Other Improvement Programs
  - what person(s) will be responsible for coordination/integration
  - the mechanism or procedure for ensuring the coordination/integration function will be performed adequately

References

1. Georgia Power Company, Plant Edwin I. Hatch, Units 1 and 2, Detailed Control Room Design Review Program Plan, October 1984.

2. "Requirements for Emergency Response Capability," NUREG-0737, Supplement 1, USNRC, Washington, D.C., December 1982, transmitted to reactor licensees via Generic Letter 82-33, December 17, 1983.

Edwin I. Hatch, Units 1 and 2
TAC Nos. 51166 and 51167
SAIC/1-263-07-351-28/29
Contract NRC-03-82-096