

December 11, 1987

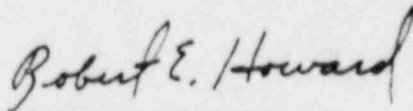
TO: Mr. L.D. Butterfield
Nuc Lic & Site Rev
34 FNE

SUBJECT: Commonwealth Edison Company's (CECo) response to the Nuclear
Regulatory Commission's (NRC) September 9, 1987 Safety
Evaluation (SE) Report of the LaSalle County Nuclear Station.

Dear Mr. Butterfield:

Enclosed is the LaSalle County Station's Units 1 and 2 Detailed
Control Room Design Review (DCRDR) Supplement 1 Summary Report. This
is CECO's response to the NRC's September 9, 1987 SE Report of
LaSalle County Station's Units 1 and 2 DCRDR Final Summary Report
dated October 1985. It is scheduled to be transmitted to the NRC by
December 16, 1987.

Sincerely yours,



Robert E. Howard
Human Factors Engineering
Coordinator
Production Services Dept.

| | |
|----------------|-----------------|
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COMMONWEALTH EDISON COMPANY

LaSalle County Station, Units 1 and 2
Detailed Control Room Design Review
Supplement 1 - Summary Report
December 1987

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DCRDR Supplement 1 - Summary Report
December 1987

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COMMONWEALTH EDISON COMPANY'S RESPONSE TO THE
NRC'S SAFETY EVALUATION REPORT OF THE
LASALLE COUNTY STATION, UNITS 1 AND 2
DETAILED CONTROL ROOM DESIGN REVIEW

INTRODUCTION

Commonwealth Edison Company (CECo) submitted the Summary Report for the LaSalle County Station, Units 1 and 2 Detailed Control Room Design Review (DCRDR) to the NRC October 29, 1985, as required by Supplement 1 to NUREG-0737. The NRC staff, assisted by consultants from Science Applications International Corporation (SAIC) and COMEX Corporation reviewed the Summary Report (SR) and conducted a Pre-Implementation Audit (PIA) at LaSalle Station from June 3 to June 6, 1986. In a letter to the NRC dated April 21, 1987 CECo subsequently modified the schedule for completion of the Human Engineering Discrepancies (HEDs) listed in the SR. Review of CECo's LaSalle County Station DCRDR activities by SAIC is documented in their Technical Evaluation (TE) Report dated August 21, 1987. The NRC staff endorses the evaluations, recommendations and conclusions as presented in the TER and included it in their Safety Evaluation (SE) Report dated September 9, 1987. This LaSalle County Station, Units 1 and 2 DCRDR Supplement 1 Report is CECo's response to that SER.

Commonwealth Edison Company's Response to the
NRC's Enclosure 1 of the SER

NRC Subject: A control room survey to identify deviations from accepted human factors principles

NRC Concern: CECo should document the source and identification of the guidelines it used to conduct the control room survey as discussed during the audit.

CECo Response: The human factors guidelines used during the LaSalle Station DCRDR to identify control room deviations from accepted human factors principles were reconfigured and reapplied to be identical to those used during the Zion, Quad Cities, Byron and Braidwood control room surveys. These guidelines were derived from those in NUREG-0700. NRC staff concerns related to differences between these CECo guidelines and NUREG-0700 were resolved as reported in the "Safety Evaluation By The Office of Nuclear Reactor Regulation Related to Detailed Control Room Design Review Commonwealth Edison Company Zion Nuclear Power Station, Units 1 and 2, Docket Nos. 50-295 and 50-304," section 4, page 2, dated March 10, 1987.

NRC Subject: Assessment of human engineering discrepancies (HEDs) to determine which are significant and should be corrected

NRC Concern #1: CECo should provide assurance that, during the assessment phase of the DCRDR, it had considered, (1) the combined effects of HEDs on operator performance, and (2) the cumulative or interactive effects of other HEDs.

CECo Response #1: The combined effects of HEDs on operator performance and the cumulative or interactive effects of HEDs were considered throughout the review and assessment process. During the review process each HED was related to a checklist guideline number, regardless of where in the review process it was identified. This served to identify how often a particular problem was identified, which helped direct our attention during the assessment.

As a function of the assessment process, the cumulative and interactive effects were considered and assessments modified to address these concerns. Also, several CRDR systems design recommendations and their interactive effects were reviewed in great detail on CAD drawings. These revealed both the cumulative strengths and weaknesses of our design recommendations and facilitated the final design specifications.

NRC Concern #2: HED 162 should be changed to category 1 and the schedule for correcting it should be advanced as appropriate.

CECo Response #2: Per the discussions conducted during the PIA, HED index number 162 was upgraded in category status to category 1. Since the potential consequences from an operator error due to this discrepancy did not change, the Level, 'B', remained the same (see page SER Encl. 1-13 of this Supplement). The corrective action for this HED however entails a change to components on the PM13J panel, the Containment Monitoring panel. That panel is scheduled to undergo complete redesign in response to other HEDs associated with it. CECo intends to implement corrective actions in a rigorous, integrated and coordinated fashion so as to preclude the introduction of additional HEDs and ensure as well a human engineered control room as is retrospectively possible. The engineering and manufacturing lead time necessary to redesign it necessitates a second refueling outage implementation date.

NRC Subject: Selection of design improvements

NRC Concern 1: CECO should review all annunciator windows against the standard and propose improvements/corrections for HEDs identified.

CECO Response 1: The HEDAT has reevaluated the HEDs associated with the Station's annunciator system. As a result, a comprehensive and integrated program will be implemented to review the content of each annunciator tile to ensure that it corresponds to the Station's accepted Abbreviation Standard. Legend content will be modified as necessary and the tile will be reengraved in accordance with accepted Human Factors Engineering design criteria. Concurrently, the tile's content will be evaluated by an operations Subject Matter Expert (SME) and a Human Factors Specialist (HFS) to determine which are time-critical and therefore of a relatively higher priority. Those so designated will have a red border placed around the perimeter of the tile to indicate to the operator that these alarms require immediate attention. Given the magnitude of this program it has been scheduled for completion by the end of the second refueling outage.

NRC Concern 2: CECO's plan to use 23 colors for background shading on control panels indicates an overuse of this method of correcting certain HEDs. This could lead to a reduction in the effectiveness of this technique to resolve HEDs. Because of the increased operator memory burden, the potential confusion, and the increased error susceptibility, the operators' ability to cope with plant emergencies may be affected.

CECO Response 2: A primary technique for allowing the operator to sort out the immediately relevant stimuli is the enhancement of displays and controls. Effective enhancement permits timely acquisition of meaningful information, facilitates correct identification of relevant control options, and allows the operator to maintain effective cognizance over system status.

Surface techniques such as using demarcation and mimic lines, color shading, and other cues are primary techniques for layout enhancement. Color enhancement is used in nuclear power plant control rooms to help clarify component identification and functional relationships among various components. Many problems, such as matrices of undifferentiated components, physically displaced controls and their associated displays, can be remedied through color shading.

Background shading also improves the efficiency of information transfer to the operator and assists his decision-making process by organizing desired associations between panel elements, and standardizing information presentation. Color enhancements also can facilitate learning and retention where components and controls are located, especially for new operators. Components having a common color also are seen as forming a group.

Since the goal of shading is to provide operator aids, if the operator does not agree with or approve the enhancement, it probably will not be successful. Operator participation is a requirement throughout the color shading process and was integral during the selection of color enhancements at LaSalle County Station.

SAIC makes reference that the number of colors used for coding should not exceed eleven and should be kept to the minimum needed to provide sufficient information as identified on page 6.5-11 in NUREG-0700. We reiterate that LaSalle County uses only six colors for coding purposes. The color shading does not represent system status or state. It is merely a perceptual aid designed to facilitate system identification. There is no meaning assigned to the shading and the shading should not be conceived of as coding.

Another factor in determining the utility of background shading is the area of the surface to which we are applying background shading. A control room the size of LaSalle County's board can afford to use a greater number of color enhancements than control rooms with lesser area, provided it has been systematically applied using sound human engineering and operating principles. Several industry documents recognize the utility of using a number of background shading colors. One EPRI document advocated and provided an example which included eight colors for one sample panel. In addition, there are precedents set throughout the industry which clearly demonstrates the effectiveness of using over twenty colors for enhancement to support system identification.

A total of six colors were chosen to be applied across the main control boards at LaSalle County for background shading during the Preliminary Design Assessment. Principles for color use, outlined in sections 6.5 and 6.6 of NUREG-0700, guided the selection of colors to be used on the control panels. Colors were selected from a pool of high contrast and matte finish shades used at other stations applied against a "Kewanee Beige" board color. As an engineered retrofit, their application extends from a total-board design evaluation that followed a system-by-system approach.

In general, controls and displays at LaSalle County were found to be grouped by function with few "extraneous" or "maverick" components. However, in these cases, background shading affords a means to functionally group these components. Both the main component group and their "maverick" components in a system were colored identically.

Safety-related component groups were background shaded. For example, engineered safeguards monitor lights and manual activation controls are located primarily on the engineered safeguards panel. However, these controls and displays also appear on panels across the total benchboard area. Similarity of function, in these cases, served as the basis for their grouping by common background shade.

Background shading was also applied to systems nested among others. In the few cases in which this technique was applied, a high contrast background shade was applied to the centrally positioned group, thereby enhancing the separation of the adjacent system.

On the whole, the selection and use of background shading is designed to work in concert with other perceptual aids and the placement design of instruments. The total-board design evaluation holds in check the potential overuse of one or more perceptual aids. Thus, where background shading is applied, the use is conservative, necessary and meaningful for operator performance.

In addition, lines of demarcation will be used, where possible, to enhance system grouping. Demarcation will be used between closely-spaced but functionally distinct systems that do not have individual components placed within other system groupings. The use of demarcation instead of background shading, in these instances, will prevent the overuse of color. The proposed demarcation consists of circumscribing functional or selected groups with a contrasting line in areas where physical space or panel edges do not already visually set apart the related components.

NRC Concern 3: The licensee should analyze the need for guardrails, provide the results of the analysis, and provide a description of the guardrails to be installed, if needed.

CECo Response 3: The need for guardrails was established prior to their implementation on the benchboards and prior to the recommendation for the vertical panels. The analysis focused on the vulnerability of controls at or near the area frequented by the operators.

The analysis revealed that the J-handle and OT-2 switches located in proximity to traffic areas are susceptible to possible inadvertent actuation. The potential for this problem was borne out at other plants which experienced inadvertent actuations and subsequently mitigated the problem with guardrails. The guardrails to be installed will be round steel of a 5/8" diameter. They will protrude a maximum of 4" from the panel. All angles will be curved and they will connect to the panel at varying intervals. The guardrails on the vertical boards will serve two purposes: 1) they will direct personnel away from the boards when they are passing by, and 2) act as a barrier for equipment, such as procedure carts, from damaging the panels.

NRC Concern 4: The use of stepladders to read instruments or manipulate controls which are installed above the recommended height could introduce new problems without correcting the original problem. CECo should determine which controls and displays must be manipulated and read in time-critical situations and develop appropriate HED corrective actions, or provide substantial justification for utilizing a stepladder as a required piece of control room operating equipment.

CECo Response 4: In response to this concern a comprehensive review of the control room panels was performed by a Human Factors Specialist (HFS) and a operations Subject Matter Expert (SME) to identify all the controls and displays outside the acceptable height envelope specified in the CECo checklist (items 1.2.5.a(1) and 1.2.5.b(1)). Those controls and displays were compared to the DCRDR Task Analysis database to determine whether any were identified as required to mitigate a transient event. For those that were, the relevant tasks were extracted from the database and evaluated by a HFS and SME to ascertain which instruments might be used in a time-critical fashion, given the constraints of the task action steps they were associated with.

No controls with a time-critical function were discerned in this review. Given that guardrails exist that will prevent inadvertent actuation of controls in the case where an operator must lean over the panel slightly in order to manipulate a control, none of the non time-critical controls will be relocated.

Some displays were identified in the review that may have to be read in a time-critical fashion. In all cases these displays were edgewise meters and were above the maximum recommended display height. All recorders were within the recommended envelope. To address this problem, these time-critical displays will be zone banded so that operators can determine at a glance whether a parameter is in normal or abnormal range.

The HEDAT feels that the use of the ergonomically designed stepladder was misconstrued. That stepladder was never intended for operator use to manipulate or read instrumentation in a time-critical situation. Rather, it was intended to be used to facilitate operator job performance and promote personal safety in non time-critical situations, such as when replacing annunciator light bulbs. Consequently, it is the company's intention to provide that aid to our operators in the control room.

NRC Concern 5: Many of the solutions to correct HEDs proposed in the CEC Co SR for LaSalle County appear to be conceptual-level solutions and are not presented as specific solutions to specific HEDs. Therefore, CEC Co should reevaluate and propose specific actions for correcting specific HEDs in sufficient detail to permit NRC evaluation.

CEC Co Response 5: The LaSalle County Station SR summarizes proposed corrective solutions to specific HEDs. Some of those solutions (MODs) are in various stages of engineering, which require long lead times. Some of those solutions, such as the background shading, labeling, etc., require iterative human factors engineering reviews. Solutions for which it is not possible to provide the degree of detail desired at this time, are and will continue to be verified by the Human Factors Engineering Review team. This team is involved in the conceptual design stage, the MOD review stage and the post implementation stage to assure that each MOD has corrected the HED problem and did not introduce new HEDs. Some of the solutions cite 'standards'. These standards were developed from the checklist used in the DCRDR, as well as other accepted Human Factors reference sources, to provide 'standard' guidance to team members designing, installing and reviewing the HED solutions. As such, they help assure uniformity in approach and provide an evaluative base for the verification process. Some of the standards were provided in the LaSalle County Station SR, e.g., the labeling standard. Finally, as a result of the additional HEDAT review required to generate this Supplemental report the clarification to some of the HEDs contain additional detail which will facilitate the NRC's evaluation.

NRC Subject: Verification that selected improvements will provide the necessary correction and will not introduce new HEDs

NRC Concern: The licensee is required to describe a formal process and plan which it will implement to accomplish a rigorous, integrated, verification of design improvements.

CECo Response: The verification process utilizes both static and dynamic reviews. Corrective actions to be implemented at LaSalle County Station are reviewed by the multidisciplinary DCRDR team as per CEC's April 14, 1983 response to Supplement 1 of NUREG-0737. The team reporting to the Production Services Department consists of Licensed Operators, Human Factors Specialists, Instrument and Control Engineers, and other engineering disciplines as needed.

The static review includes the application of appropriate guidelines and standards to each corrective action to ensure compliance with accepted human engineering considerations. The dynamic review includes the application of techniques to determine the operational impact the proposed design change will have on the operations of the plant. Various approaches to discerning these influences are available to the review team. These include: table top reviews, surveys and interviews with operations personnel, mock-up and simulation. When mock-ups of the control room are used, one quarter scale or larger will be used. The technique selected is based upon the nature and extent of change resulting from the design modifications. Operations personnel are involved in all stages of this review so that corrective actions benefit from operator experience. Drawings or mock-ups of recommended design modification are reviewed by operations personnel. Operations involvement in any design modification is an important step in the process of implementing corrective actions.

When appropriate, control room modifications are designed as a package. For example, labeling changes, background shading, and control relocation would be mocked up for plant engineering and operations approval. Designing modifications as a package ensures that the modifications are integrated and that no new HEDs are introduced by the changes.

At present, each control room modification for LaSalle Station is required to be reviewed by the human factors group at CEC. For each mod received, a human factors evaluation is conducted and recommendations forwarded to the cognizant engineer. Once modifications are implemented on the controls panels, human factors engineers and station representatives review the changes using the appropriate static and dynamic verification techniques described above.

NRC Subject: Coordination of control room improvements with changes from other Supplement 1 to NUREG-0737 Initiatives

NRC Concern: CEC should confirm that the information displayed and controls provided in the control room support the information and control requirements of the upgraded EOPs.

CECo Reponse: During the conduct of the DCRDR, LaSalle County Station operators and human factors specialists, as part of the DCRDR Team, performed a Validation of Control Room Function in which existing procedures were utilized to evaluate the adequacy of the control room design for the mitigation of transient events. If for any reason controls and/or displays were deemed to be inadequate they were documented as HEDs and subsequently evaluated by the HEDAT.

At the time of the conduct of our review the station was still using procedures developed from Rev. 1 of the GE BWR Owners Group Emergency Procedure guidelines (EPGs). The DCRDR Task Analysis database was generated from tasks gleaned from Rev. 3G of the EPGs. Hence, though not comprehensive or complete, a preliminary review of the adequacy of control room instrumentation to support symptom oriented procedures was conducted at LaSalle County Station in concert with the conduct of the DCRDR. Nonetheless, CECO in its response to Supplement 1 to NUREG-0737 has committed to a thorough human factors engineering review of each station's upgraded EOPs. A substantial element of that review will be a comparison of the stations' DCRDR Task Analysis database with the upgraded EOPs thereby integrating the various review approaches into discerning the adequacy of the controls and displays contained in each stations' control room for the mitigation of transient events.

NRC Subject: Other DCRDR activities not specifically required by Supplement 1 to NUREG-0737

1. Review of Remote Shutdown Facilities

NRC Concern: The NRC audit team noted that the suppression pool level meter had scale graduation increments that were inconsistent with good human engineering practice. Therefore, the licensee should provide zone markings on this meter which would indicate normal and abnormal operating ranges to aid the operator.

CECo Response: The HEDAT agrees with the NRC's assessment of the importance of the Suppression Pool Level indication at the Remote Shutdown panel. Therefore, that indicator will be permanently zone banded by the completion of the first refueling outage, which is the next scheduled refueling outage.

NRC Subject: Other DCRDR activities not specifically required by Supplement 1 to NUREG-0737

2. Operating Experience Review

NRC Concern: Although the OER conducted at LaSalle County is contributing to the success of the DCRDR, an examination of the documentation indicated that additional operator follow-up interviews would have added significantly to this process.

CECo Response: CEC Co maintains that its conduct of OERs, which exceeded Supplement 1 to NUREG-0737 requirements, demonstrates its commitment to safe nuclear power generation and the adequate human factoring of its control rooms. In excess of 20% of the Human Engineering Discrepancies (HEDs) discerned at LaSalle County Station were discovered via this process. That percentage represents a significant contribution to the entire process.

As indicated at the Pre Implementation Audit, follow-up interviews were conducted on an as-needed basis by the Human Factors Specialist (HFS). The determination as to whether interviews were necessary was made by the HFS and the SRO licensed Subject Matter Expert (SME) assisting with this aspect of the review, after a review of the summarized questionnaire response. Follow-up interviews were conducted if there was any confusion as to the content and/or intent of the response on the part of the reviewers. We are convinced that the approach we implemented contained sufficient methodological safeguards, as delineated in our Program Plan, to preclude the possibility that a significant number of additional HEDs would have been discerned should either additional follow-up interviews been conducted or different reviewers been involved.

NRC Subject: DCRDR Results

NRC Concern #1: Enclosure A to the SER identifies and discusses HEDs for which proposed corrections are not satisfactory. Responses to these concerns should be provided in a supplemental SR.

CECo Response #1: Responses to the NRC concerns about individual HEDs identified and discussed in the SER are contained in this Supplement to the LaSalle County Station DCRDR Summary Report in the following Appendices:

Commonwealth Edison Company's Revised Response/Clarification
to HEDs Referred to in the NRC's Safety Evaluation (SE) Report
of the LaSalle County Station DCRDR

Safety Evaluation Report - Enclosure 1
Revised Responses
(SER Encl. 1)

and,

Commonwealth Edison Company's Revised Response/Clarification
to HEDs Referred to in the NRC's Safety Evaluation (SE) Report
of the LaSalle County Station DCRDR

Safety Evaluation Report - Enclosure A
Revised Responses
(SER Encl. A)

NRC Concern #2: Appendix A of Enclosure B to the SER (TER dated August 4, 1987) identifies a number of HEDs which the licensee does not plan to correct. The justification provided for not correcting these HEDs was determined to be inadequate by the staff for the reasons discussed on pages 27 and 28 of Enclosure B and as stated in Appendix A. These concerns should be addressed in a supplement to the licensee's SR which should be submitted on a schedule negotiated with the project manager.

CECo Response #2: Responses to the NRC concerns about individual HEDs identified and discussed in Appendix A of Enclosure B to the SER (TER dated August 4, 1987) are contained in this Supplement to the LaSalle County Station DCRDR Summary Report in the following Appendices:

Commonwealth Edison Company's Revised Response/Clarification
to HEDs Referred to in the NRC's Safety Evaluation (SE) Report
of the LaSalle County Station DCRDR

Safety Evaluation Report - Enclosure B (TER)
Revised Responses
(TER Append. A1)

and,

Commonwealth Edison Company's Revised Response/Clarification
to HEDs Referred to in the NRC's Safety Evaluation (SE) Report
of the LaSalle County Station DCRDR

Safety Evaluation Report - Enclosure B (TER)
Revised Responses
(TER Append. A2)

and,

Commonwealth Edison Company's Revised Response/Clarification
to HEDs Referred to in the NRC's Safety Evaluation (SE) Report
of the LaSalle County Station DCRDR

Safety Evaluation Report - Enclosure B (TER)
Revised Responses
(TER Append. A3)

NRC Concern #3: Due to the delay in the refueling outage schedule, CECo should reevaluate the proposed implementation schedule for correcting HEDs at LaSalle County and provide assurance that safety significant HEDs will be corrected during the first refueling outage scheduled for each unit (Unit 1 - February 1988, Unit 2 - July 1988).

CECo Response #3: The HEDAT reevaluated all Category 1 HEDs in terms of their implementation schedule in response to this concern. In one instance the corrective action has been implemented and the HED corrective status is complete. Six Category 1 Level 'C' HEDs were Accept-As-Is with no corrective action anticipated. The remaining eight Category 1 HEDs entailed system/panel redesign that require such a significant amount of engineering leadtime that the earliest realistic implementation outage is the second. These are individually discussed in the appendices to this Supplement.

NRC Concern #4: A number of HEDs previously identified in the October 1985 SR, and later at the June 1986 audit, were to be corrected during the first refueling outage. However, from the April 21, 1987 CECo letter, it appears that several of these HED corrections are now to be implemented by the second refueling outage. CECo should provide acceptable justification for the proposed delay in correcting these HEDs which are listed below:

| | |
|-----|-----|
| 13 | 69 |
| 15 | 10 |
| 354 | 118 |
| 206 | 120 |
| 341 | 144 |
| 313 | 152 |

CECo Response #4: These HEDs are individually discussed in the following Appendix to this Supplement to the LaSalle County DCRDR Final Summary Report:

Commonwealth Edison Company's Revised Response/Clarification
to HEDs Referred to in the NRC's Safety Evaluation (SE) Report
of the LaSalle County Station DCRDR

Safety Evaluation Report - Enclosure 1
Revised Responses
(SER Encl. 1)

NRC Subject: Conclusion 1. Control Room Survey

NRC Concern: The staff requires that CECo document the human factors guidelines it used to conduct the control room survey as discussed during the PIA.

CECo Response: The human factors guidelines used during the LaSalle County Station DCRDR to identify control room deviations from accepted human factors principles were reconfigured and reapplied to be identical to those used during the Zion, Quad Cities, Byron and Braidwood control room surveys. These guidelines were derived from those in NUREG-0700. NRC staff concerns related to differences between these CECo guidelines and NUREG-0700 were resolved as reported in the "Safety Evaluation By The Office of Nuclear Reactor Regulation Related to Detailed Control Room Design Review Commonwealth Edison Company Zion Nuclear Power Station, Units 1 and 2, Docket Nos. 50-295 and 50-304", section 4, page 2, dated March 10, 1987.

NRC Subject: Conclusion 2. Assessment of HEDs

NRC Concern: CECo is required to provide written confirmation that: (1) the combined effects of HEDs on operator performance, and (2) the cumulative or interactive effects of HEDs were considered in the assessment process. In addition, CECo is required to provide assurance that HED 0162 has been reclassified as Category 1 as agreed to during the NRC audit. The schedule for correcting HED 0162 should be advanced to reflect the reclassification.

CECo Response: The combined effects of HEDs on operator performance and the cumulative or interactive effects of HEDs were considered throughout the review and assessment process. During the review process each HED was related to a checklist guideline number, regardless of where in the review process it was identified. This served to identify how often a particular problem was identified, which helped direct our attention during the assessment.

As a function of the assessment process, the cumulative and interactive effects were considered and assessments modified to address these concerns. Also, several CRDR systems design recommendations and their interactive effects were reviewed in great detail on CAD drawings. These revealed both the cumulative strengths and weaknesses of our design recommendations and facilitated the final design specifications.

In addition, per the discussions conducted during the PIA, HED index number 162 was upgraded in category status to category 1. Since the potential consequences from an operator error due to this discrepancy did not change, the Level, 'B', remained the same (see page SER Encl. 1-13 of this Supplement). The corrective action for this HED however entails a change to components on the PM13J panel, the Containment Monitoring panel. That panel is scheduled to undergo complete redesign in response to other HEDs associated with it. CECO intends to implement corrective actions in a rigorous, integrated and coordinated fashion so as to preclude the introduction of additional HEDs and ensure as well a human engineered control room as is retrospectively possible. The engineering and manufacturing lead time necessary to redesign it necessitates a second refueling outage implementation date.

NRC Subject: Conclusion 3. Selection of Design Improvements

NRC Concern: The licensee is required to reevaluate the proposed conceptual solutions for correcting HEDs identified in Enclosure A to this SER, and to provide specific actions to correct each HED in sufficient detail to permit NRC evaluation.

CECO Response 5: The LaSalle County Station SR summarizes proposed corrective solutions to specific HEDs. Some of those solutions (MODs) are in various stages of engineering, which require long lead times. Some of those solutions, such as the background shading, labeling, etc., require iterative human factors engineering reviews. Solutions for which it is not possible to provide the degree of detail desired at this time, are and will continue to be verified by the Human Factors Engineering Review team. This team is involved in the conceptual design stage, the MOD review stage and the post implementation stage to assure that each MOD has corrected the HED problem and did not introduce new HEDs. Some of the solutions cite 'standards'. These standards were developed from the checklist used in the DCRDR, as well as other accepted Human Factors reference sources, to provide 'standard' guidance to team members designing, installing and reviewing the HED solutions. As such, they help assure uniformity in approach and provide an evaluative base for the verification process. Some of the standards were provided in the LaSalle County Station SR, e.g., the labeling standard. Finally, as a result of the additional HEDAT review required to generate this Supplemental report the clarification to some of the HEDs contain additional detail which will facilitate the NRC's evaluation.

NRC Subject: Conclusion 3(a). Selection of Design Improvements

NRC Concern: Identify the annunciators that require corrective action, propose the action to be implemented, and propose a schedule for completing the action.

CECo Response: The HEDAT has reevaluated the HEDs associated with the Station's annunciator system. As a result, a comprehensive and integrated program will be implemented to review the content of each annunciator tile to ensure that it corresponds to the Station's accepted Abbreviation Standard. Legend content will be modified as necessary and the tile will be reengraved in accordance with accepted Human Factors Engineering design criteria. Concurrently, the tile's content will be evaluated by an operations Subject Matter Expert (SME) and a Human Factors Specialist (HFS) to determine which are time-critical and therefore of a relatively higher priority. Those so designated will have a red border placed around the perimeter of the tile to indicate to the operator that these alarms require immediate attention. Given the magnitude of this program it has been scheduled for completion by the end of the second refueling outage.

NRC Subject: Conclusion 3(b). Selection of Design Improvements

NRC Concern: Analyze the need for using guardrails, as proposed, to prevent inadvertent actuation of controls located near the front edge of certain panels, and provide the results of the analyses and a description of the guardrails to be installed, if needed, for NRC review.

CECo Response: The need for guardrails was established prior to their implementation on the benchboards and prior to the recommendation for the vertical panels. The analysis focused on the vulnerability of controls at or near the area frequented by the operators. The analysis revealed that the J-handle and OT-2 switches located in proximity to traffic areas are susceptible to possible inadvertent actuation. The potential for this problem was borne out at other plants which experienced inadvertent actuations and subsequently mitigated the problem with guardrails. The guardrails to be installed will be round steel of a 5/8" diameter. They will protrude a maximum of 4" from the panel. All angles will be curved and they will connect to the panel at varying intervals. The guardrails on the vertical boards will serve two purposes: 1) they will direct personnel away from the boards when they are passing by, and 2) act as a barrier for equipment, such as procedure carts, from damaging the panels.

NRC Subject: Conclusion 3(c). Selection of Design Improvements

NRC Concern: Reevaluate the overuse of colors to provide panel background shading and padding for correcting certain HEDs, and propose actions for correcting some of these HEDs which will aid rather than hinder operator actions during emergency operations.

CECO Response: A primary technique for allowing the operator to sort out the immediately relevant stimuli is the enhancement of displays and controls. Effective enhancement permits timely acquisition of meaningful information, facilitates correct identification of relevant control options, and allows the operator to maintain effective cognizance over system status.

Surface techniques such as using demarcation and mimic lines, color shading, and other cues are primary techniques for layout enhancement. Color enhancement is used in nuclear power plant control rooms to help clarify component identification and functional relationships among various components. Many problems, such as matrices of undifferentiated components, physically displaced controls and their associated displays, can be remedied through color shading.

Background shading also improves the efficiency of information transfer to the operator and assists his decision-making process by organizing desired associations between panel elements, and standardizing information presentation. Color enhancements also can facilitate learning and retention where components and controls are located, especially for new operators. Components having a common color also are seen as forming a group.

Since the goal of shading is to provide operator aids, if the operator does not agree with or approve the enhancement, it probably will not be successful. Operator participation is a requirement throughout the color shading process and was integral during the selection of color enhancements at LaSalle County Station.

SAIC makes reference that the number of colors used for coding should not exceed eleven and should be kept to the minimum needed to provide sufficient information as identified on page 6.5-11 in NUREG-0700. We reiterate that LaSalle County uses only six colors for coding purposes. The color shading does not represent system status or state. It is merely a perceptual aid designed to facilitate system identification. There is no meaning assigned to the shading and the shading should not be conceived of as coding.

Another factor in determining the utility of background shading is the area of the surface to which we are applying background shading. A control room the size of LaSalle County's board can afford to use a greater number of color enhancements than control rooms with lesser area, provided it has been systematically applied using sound human engineering and operating principles. Several industry documents recognize the utility of using a number of background shading colors. One EPRI document advocated and provided an example which included eight colors for one sample panel. In addition, there are precedents set throughout the industry which clearly demonstrates the effectiveness of using over twenty colors for enhancement to support system identification.

A total of six colors were chosen to be applied across the main control boards at LaSalle County for background shading during the Preliminary Design Assessment. Principles for color use, outlined in sections 6.5 and 6.6 of NUREG-0700, guided the selection of colors to be used on the control panels. Colors were selected from a pool of high contrast and matte finish shades used at other stations applied against a "Kewanee Beige" board color. As an engineered retrofit, their application extends from a total-board design evaluation that followed a system-by-system approach.

In general, controls and displays at LaSalle were found to be grouped by function with few "extraneous" or "maverick" components. However, in these cases, background shading affords a means to functionally group these components. Both the main component group and their "maverick" components in a system were colored identically.

Background shading was also applied to systems nested among others. In the few cases in which this technique was applied, a high contrast background shade was applied to the centrally positioned group, thereby enhancing the separation of the adjacent system.

On the whole, the selection and use of background shading is designed to work in concert with other perceptual aids and the placement design of instruments. The total-board design evaluation holds in check the potential overuse of one or more perceptual aids. Thus, where background shading is applied, the use is conservative, necessary and meaningful for operator performance.

In addition, lines of demarcation will be used, where possible, to enhance system grouping. Demarcation will be used between closely-spaced but functionally distinct systems that do not have individual components placed within other system groupings. The use of demarcation instead of background shading, in these instances, will prevent the overuse of color. The proposed demarcation consists of circumscribing functional or selected groups with a contrasting line in areas where physical space or panel edges do not already visually set apart the related components.

NRC Subject: Conclusion 3(d). Selection of Design Improvements

NRC Concern: Analyze the need for installing an "ergonomically designed stepladder" for correcting HEDs associated with controls and/or displays which are above the maximum recommended height. For those controls and displays which must be manipulated or read in time-critical situations, propose appropriate corrective actions.

CECo Response: In response to this concern a comprehensive review of the control room panels was performed by a Human Factors Specialist (HFS) and a operations Subject Matter Expert (SME) to identify all the controls and displays outside the acceptable height envelope specified in the CECo checklist (items 1.2.5.a(1) and 1.2.5.b(1)). Those controls and displays were compared to the DCRDR Task Analysis database to determine whether any were identified as required to mitigate a transient event. For those that were, the relevant tasks were extracted from the database and evaluated by a HFS and SME to ascertain which instruments might be used in a time-critical fashion, given the constraints of the task action steps they were associated with.

No controls with a time-critical function were discerned in this review. Given that guardrails exist that will prevent inadvertent actuation of controls in the case where an operator must lean over the panel slightly in order to manipulate a control, none of the non time-critical controls will be relocated.

Some displays were identified in the review that may have to be read in a time-critical fashion. In all cases these displays were edgewise meters and were above the maximum recommended display height. All recorders were within the recommended envelope. To address this problem, these time-critical displays will be zone banded so that operators can determine at a glance whether a parameter is in normal or abnormal range.

The HEDAT feels that the use of the ergonomically designed stepladder was misconstrued. That stepladder was never intended for operator use to manipulate or read instrumentation in a time-critical situation. Rather, it was intended to be used to facilitate operator job performance and promote personal safety in non time-critical situations, such as when replacing annunciator light bulbs. Consequently, it is the company's intention to provide that aid to our operators in the control room.

NRC Subject: Conclusion 4. Verification that HEDs are corrected and that new HEDs are not introduced

- NRC Concern:
- a. Provide a description of the systematic process to be used to verify that proposed design improvements correct HEDs and do not introduce new HEDs.
 - b. Confirm that operations personnel, performing as members of the DCRDR multidisciplinary review team, will contribute significantly to the verification process.

- c. Confirm that control room design improvements will be verified as a package to the extent possible.
- d. Confirm that control room design improvements will be verified on either the control room, the simulator, or a full scale mock-up.

CECo Response: The verification process utilizes both static and dynamic reviews. Corrective actions to be implemented at LaSalle County Station are reviewed by the multidisciplinary DCRDR team as per CECO's April 14, 1983 response to Supplement 1 of NUREG-0737. The team reporting to the Production Services Department consists of Licensed Operators, Human Factors Specialists, Instrument and Control Engineers, and other engineering disciplines as needed.

The static review includes the application of appropriate guidelines and standards to each corrective action to ensure compliance with accepted human engineering considerations. The dynamic review includes the application of techniques to determine the operational impact the proposed design change will have on the operations of the plant. Various approaches to discerning these influences are available to the review team. These include: table top reviews, surveys and interviews with operations personnel, mock-up and simulation. When mock-ups of the control room are used, one quarter scale or larger will be used. The technique selected is based upon the nature and extent of change resulting from the design modifications. Operations personnel are involved in all stages of this review so that corrective actions benefit from operator experience. Drawings or mock-ups of recommended design modification are reviewed by operations personnel. Operations involvement in any design modification is an important step in the process of implementing corrective actions.

When appropriate, control room modifications are designed as a package. For example, labeling changes, background shading, and control relocation would be mocked up on panel drawings and submitted to plant engineering and operations for approval. Designing modifications as a package ensures that the modifications are integrated and that no new HXDs are introduced by the changes.

At present, each control room modification for LaSalle County Station is required to be reviewed by the human factors group at CECO. For each mod received, a human factors evaluation is conducted and recommendations forwarded to the cognizant engineer. Once modifications are implemented on the controls panels, human factors engineers and station representatives review the changes using the appropriate static and dynamic verification techniques described above.

NRC Subject: Conclusion 5(a). Coordination with improvements from other programs

NRC Concern: Provide confirmation that the control room design supports the upgraded emergency operating procedures (EOPs).

CECo Reponse: During the conduct of the DCRDR, LaSalle County Station operators and human factors specialist, as part of the DCRDR Team, performed a Validation of Control Room Function in which existing procedures were utilized to evaluate the adequacy of the control room design for the mitigation of transient events. If for any reason controls and/or displays were deemed to be inadequate they were documented as HEDs and subsequently evaluated by the HEDAT. At the time of the conduct of our review the station was still using procedures developed from Rev. 1 of the GE BWR Owners Group Emergency Procedure guidelines (EPGs). The DCRDR Task Analysis database was generated from tasks gleaned from Rev. 3G of the EPGs. Hence, though not comprehensive or complete, a preliminary review of the adequacy of control room instrumentation to support symptom oriented procedures was conducted at LaSalle County Station in concert with the conduct of the DCRDR. Nonetheless, CECO in its response to Supplement 1 to NUREG-0737 has committed to a thorough human factors engineering review of each station's upgraded EOPs. A substantial element of that review will be a comparison of the stations' DCRDR Task Analysis database with the upgraded EOPs thereby integrating the various review approaches into discerning the adequacy of the controls and displays contained in each stations' control room for the mitigation of transient events.

NRC Subject: Conclusion 6(a). Remote Shutdown Panel

NRC Concern: Provide assurance that permanent zone banding which indicates normal and abnormal operating ranges on the suppression pool level meter on the remote shutdown panel will be installed by startup following the next refueling outage.

CECo Response: The HEDAT agrees with the NRC's assessment of the importance of the Suppression Pool Level indication at the Remote Shutdown panel. Therefore, that indicator will be permanently zone banded by the completion of the first refueling outage, which is the next scheduled refueling outage.

NRC Subject: Conclusions 7(a). DCRDR HEDs

NRC Concern: Propose corrective actions, which are acceptable to the staff, for the HEDs identified in Enclosure A to this SER.

CECo Response: Responses to the NRC concerns about individual HEDs identified and discussed in Enclosure A to the SER are contained in this Supplement to the LaSalle County Station DCRDR Summary Report in the following Appendix:

Commonwealth Edison Company's Revised Response/Clarification
to HEDs Referred to in the NRC's Safety Evaluation (SE) Report
of the LaSalle County Station DCRDR

Safety Evaluation Report - Enclosure A
Revised Responses
(SER Encl. A)

NRC Subject: Conclusion 7(b). DCRDR HEDs

NRC Concern: Provide either adequate justification for not correcting/partially correcting significant HEDs, or propose satisfactory corrective actions for HEDs identified in Tables A1 through A3 of Appendix A to Enclosure B (TER dated August 4, 1987).

CECo Response: Responses to the NRC concerns about individual HEDs identified and discussed in Tables A1 through A3 in Appendix A of Enclosure B to the SER (TER dated August 4, 1987) are contained in this Supplement to the LaSalle County Station DCRDR Summary Report in the following Appendices:

Commonwealth Edison Company's Revised Response/Clarification
to HEDs Referred to in the NRC's Safety Evaluation (SE) Report
of the LaSalle County Station DCRDR

Safety Evaluation Report - Enclosure B (TER)
Revised Responses
(TER Append. A1)

and,

Commonwealth Edison Company's Revised Response/Clarification
to HEDs Referred to in the NRC's Safety Evaluation (SE) Report
of the LaSalle County Station DCRDR

Safety Evaluation Report - Enclosure B (TER)
Revised Responses
(TER Append. A2)

and,

Commonwealth Edison Company's Revised Response/Clarification
to HEDs Referred to in the NRC's Safety Evaluation (SE) Report
of the LaSalle County Station DCRDR

Safety Evaluation Report - Enclosure B (TER)
Revised Responses
(TER Append. A3)

NRC Subject: Conclusion 7(c). DCRDR HEDs

NRC Concern: Reevaluate the proposed implementation schedule for correcting HEDs and provide assurance that safety significant HEDs will be corrected during the first refueling outage scheduled for each unit (Unit 1 - February 1988, Unit 2 - July 1988).

CECo Response: The HEDAT reevaluated all Category 1 HEDs in terms of their implementation schedule in response to this concern. In one instance the corrective action has been implemented and the HED corrective status is complete. Six Category 1 Level 'C' HEDs were Accept-As-Is with no corrective action anticipated. The remaining eight Category 1 HEDs entailed system/panel redesign that require such a significant amount of engineering leadtime that the earliest realistic implementation outage is the second. These are individually discussed in the appendices to this Supplement.

NRC Subject: Conclusion 7(d). DCRDR HEDs

NRC Concern: Provide acceptable justification for the delay in implementing corrective actions for HEDs as identified in the CEC Co letter dated April 21, 1987.

CECo Response: The following HEDs were changed from a first to a second refueling outage in terms of when corrective actions would be made in the April 21, 1987 CEC Co letter to the NRC.

| | |
|-----|-----|
| 13 | 69 |
| 15 | 10 |
| 354 | 118 |
| 206 | 120 |
| 341 | 144 |
| 313 | 152 |

These HEDs are individually discussed in the following Appendix to this Supplement to the LaSalle County DCRDR Final Summary Report:

Commonwealth Edison Company's Revised Response/Clarification
to HEDs Referred to in the NRC's Safety Evaluation (SE) Report
of the LaSalle County Station DCRDR

Safety Evaluation Report - Enclosure 1
Revised Responses
(SER Encl. 1)

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| 160 | 160 / TER Append. A2-12 | Previous: Accept As Is Revised: 12/31 |
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Commonwealth Edison Company's Revised Response/Clarification
to HEDs Referred to in the NRC's Safety Evaluation (SE) Report
of the LaSalle County Station DCRDR

Safety Evaluation Report - Enclosure 1
Revised Responses
(SER Encl. 1)

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 13, 15 & 354
HED CATEGORY 2A
FSR PAGE 90

FINDING

Overhead lighting is causing glare that interferes with the readability of displays. (Photo Log No. F-2, F-3)

RESPONSE

The lighting in the control room will be modified to minimize the glare. Alternatives to be considered include configuration of louvres, different size louvres, modifying light configuration, changing wattage of light bulbs.

NRC/SAIC COMMENT

This HED was identified in the October 1985 SR and at the June 1986 audit as being corrected during the first refueling outage. The subsequent April 21, 1987 CECO letter, however, indicates that the corrective action for this HED will be implemented by the second refueling outage. CECO should provide acceptable justification for the proposed delay in implementation.

CECO CLARIFICATION

A preliminary evaluation of the lighting and glare problems has been done by an architect engineer. Existing light levels are basically adequate but may require some small additions in local areas. A number of alternatives exist for the reduction of glare. All will be considered and all or some will be implemented to reduce glare. Since the approaches will interact with one another, their interactive effects need to be evaluated. For example, larger fixture lamps may be required to increase lighting levels in areas which do not meet minimum lighting requirements. The consequences of this corrective action may result in further increases in glare. However, addition of ceiling light diffusers and modification of existing overall ceiling grids near board areas experiencing glare can be installed but would require modification to existing ceiling structures. Counters and desk tops may be replaced or have a coating applied to reduce glare and improve contrast ratios, antiglare covers may be installed on the CRT surfaces to reduce glare and small hoods may be placed over curved meters to reduce glare. It is anticipated that eleven months would be required to solidify the design and prepare for

installation as well as to get the necessary materials delivered on site. Project engineering and the station require six months lead time prior to an outage to schedule and coordinate activities and to ensure that all QA/QC requirements have been met regarding the work to be performed. That means that the earliest the modification could be implemented would be an outage 17 months from now. Both units scheduled first outages will have passed by that time necessitating a second outage date for the correction of this HED.

IMPLEMENTATION
1ST REFUELING OUTAGE

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 206
HED CATEGORY 2A
FSR PAGE 33

FINDING

The PM03J panel does not contain an annunciator acknowledge station. Operators were observed responding to annunciator alarms for that panel at adjacent panels during the validation.

RESPONSE

Annunciator response controls will be added to PM03J. This will aid the operators in acknowledging alarms on this panel.

NRC/SAIC COMMENT

This HED was identified in the October 1985 SR and at the June 1986 audit as being corrected during the first refueling outage. The subsequent April 21, 1987 CEC0 letter, however, indicates that the corrective action for this HED will be implemented by the second refueling outage. CEC0 should provide acceptable justification for the proposed delay in implementation.

CEC0 CLARIFICATION

The PM03J panel is the condensate and feedwater panel. A number of HEDs were identified during the DCRDR that cited this panel. The HEDAT in considering the interactive and cumulative effect of these HEDs decided that the entire panel would be redesigned. This will entail the relocation of controls and displays as well as the modification of lines of demarcation, background shading and mimics. Due to the extensive nature of these changes, they were scheduled for the second outage. The addition of an annunciator acknowledge station to the panel was anticipated as part of that modification package. The specification of a first refueling outage date for this HED in the Final Summary Report was an error. The second outage is commensurate with the HEDATs' original intentions and hence the change was made in the April 27th submittal.

IMPLEMENTATION
1ST REFUELING OUTAGE

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 341
HED CATEGORY 1B
FSR PAGE 26

FINDING

The operator survey indicated a need for an averaging circuit (or even new sensor location) for determining bulk or average suppression pool temperature. The current charts are hard to read and suppression pool temperature stratification affects the sensors.

RESPONSE

The current recorder contains points for air temperature as well as water temperature. The air temperature points will be removed, thus improving the readability of the charts. The operators will be able to determine average temperature when the charts have been modified.

NRC/SAIC COMMENT

This HED was identified in the October 1985 SR and at the June 1986 audit as being corrected during the first refueling outage. The subsequent April 21, 1987 CECOs letter, however, indicates that the corrective action for this HED will be implemented by the second refueling outage. CECO should provide acceptable justification for the proposed delay in implementation.

CECO CLARIFICATION

The PM13J panel is the containment monitoring panel. A number of HEDs were identified during the DCRDR that cited this panel. The HEDAT in considering the interactive and cumulative effect of these HEDs decided that the entire panel would be redesigned. This will entail the relocation of controls and displays, the addition/deletion of controls and displays (such as the recorder points identified in this HED), as well as the addition of lines of demarcation, background shading and mimics. Due to the extensive nature of these changes, they were scheduled for the second outage. The specification of a first refueling outage date for this HED was an error. The second outage is commensurate with the HEDATs' original intentions and hence the change was made in the April 27th submittal.

IMPLEMENTATION
1ST REFUELING OUTAGE

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 313
HED CATEGORY 2C
FSR PAGE 204

FINDING

The turbine vibration phase angle selector, turbine vibration phase angle 1VI-TS005, and eccentricity speed control valve bypass valve position instrumentation are not used by the control room operators. (Photo Log No. B-7)

RESPONSE

This equipment will be removed from the control panels.

NRC/SAIC COMMENT

This HED was identified in the October 1985 SR and at the June 1986 audit as being corrected during the first refueling outage. The subsequent April 21, 1987 CEC Co letter, however, indicates that the corrective action for this HED will be implemented by the second refueling outage. CEC Co should provide acceptable justification for the proposed delay in implementation.

CECO CLARIFICATION

This HED was reevaluated by the HEDAT. When the DCRDR was conducted nearly three years ago it was true that the cited instruments were not used by the control room operators. Operations input at the HEDAT indicated that this is no longer the case. They indicated that while not time-critical the instrumentation is used during startups and system testing and is desirable to have at its current location on the PM02J panel. Consequently, reevaluation of this HED by the HEDAT has determined that the discrepancy and problem with the instrumentation no longer exists and that therefore it will not be removed from the control room.

IMPLEMENTATION
1ST REFUELING OUTAGE

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 69
HED CATEGORY 1C
FSR PAGE 72

FINDING

There are controls on vertical panels that are located outside the 34 to 70 inch envelope above the floor, recommended by the guidelines. (Photo Log No. A-11)

RESPONSE

An ergonomically designed step ladder will be provided for use on these panels. In addition, guardrails will be added to PM06J and PM13J to protect against inadvertent actuation of controls.

NRC/SAIC COMMENT

The reviewers are concerned that the use of stepladders would aggravate the situation rather than improve it. CECO should determine which controls must be manipulated in a time-critical situation and provide an appropriate corrective action. Also, the April 21, 1987 CECO letter indicated that the corrective action is to be implemented by the second refueling outage. CECO should provide acceptable justification for the proposed delay in the implementation of the corrective action.

CECO CLARIFICATION

The following controls were cited in both the HED and in the DCRDR Task Analysis:

- "POST LOCA H2/O2 MON SYS" (2PM13J)
- "INST NITROGEN DRYER PURGE OUTLET VALVE" (1PM13J)
- "DRYWELL VENT PURGE OUTLET VALVE" (2PM06J)
- "MAIN STEAM CH SELECT" (2H13-P600)
- "POWER SUPPLY" (2H13-P635)
- "TRIP CHECK ADJUST" (2H13-P636)

The cited controls from the original HED are examples. A comprehensive review of the control room panels was performed by a HFS and an SME to identify all the controls and displays outside the envelopes specified in the CECO checklist. Those controls/displays were compared to the DCRDR Task Analysis data base to determine whether any were identified as required to mitigate a transient event. Relevant tasks were evaluated and SME input was utilized to ascertain which instruments might be used in a time critical fashion. No controls with a time critical function were discerned. Given that guardrails exist that will prevent inadvertent actuation of controls in

the cases where a fifth percentile female operator must lean over the panels in order to manipulate a control, none of the non time critical controls will be relocated. Displays outside the envelope that may have to be read in a time critical sense will be zone banded so that operators can determine at a glance whether the parameter is in a normal or abnormal range.

IMPLEMENTATION
1ST REFUELING OUTAGE

REVISED IMPLEMENTATION
1ST REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 10
HED CATEGORY 1C
FSR PAGE 82

FINDING

The following panels are mirror imaged across the two units; PM16J, PM13J, PM09J, PM10J, N62-P601, N62-P600, PM05J, PM06J, PM07J. Only the PM07J panels have mirrored equipment pieces across both units. (Photo Log No. I-14)

RESPONSE

The mirror imaging is between panels, not within panels. Only the PM07J panels are located adjacent to each other. These panels are enhanced by mimicking and demarcation and the operators report no difficulty in differentiating between them. The other panels (located in the horseshoe) will be enhanced by color-coded guardrails. The guardrails, in addition to existing panel labels, will clearly differentiate between the respective units.

NRC/SAIC COMMENT

There is a concern that the proposed color-coded guardrail will not enhance the control room but may be an additional source of clutter. Also, the April 21, 1987 CECO letter indicated that the corrective action is to be implemented by the second refueling outage. CECO should provide acceptable justification for the proposed delay in the implementation of the corrective action.

CECO CLARIFICATION

Reevaluation by the HEDAT resulted in concurrence with the NRC's concerns about overuse of color in the control room. Therefore, the guardrails will not be color-coded. Existing panel labels are sufficient to differentiate between panels. Since no corrective action is warranted, the implementation date has been changed to "Accept As Is".

IMPLEMENTATION
1ST REFUELING OUTAGE

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 118
HED CATEGORY 3C
FSR PAGE 171

FINDING

Surface coding paint on some controls is chipped or worn off. (Photo Log No. A-21, A-21.1)

RESPONSE

Surface coding paint will be replaced on all controls where it has worn off or chipped. In addition, shift supervisors will be advised to notify maintenance when coding wears off any controls.

NRC/SAIC COMMENT

This HED was identified in the October 1985 SR and at the June 1986 audit as being corrected during the first refueling outage. The subsequent April 21, 1987 CEC Co letter, however, indicates that the corrective action for this HED will be implemented by the second refueling outage. CEC Co should provide acceptable justification for the proposed delay in implementation.

CECO CLARIFICATION

The corrective action will be implemented by the first refueling outage. Surface coding paint will be replaced on all controls where it has worn off or chipped. In addition, shift supervisors will be advised to notify maintenance when coding wears off any controls.

IMPLEMENTATION
1ST REFUELING OUTAGE

REVISED IMPLEMENTATION
1ST REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 120
HED CATEGORY 2C
FSR PAGE 178

FINDING

Legend pushbuttons are not distinguishable from legend lights on panels PM02J, H13-P603, H13-P602, OPM08J. (Photo Log No. A-25)

RESPONSE

A painted border will be added around the perimeter of pushbuttons to differentiate between pushbuttons and legend lights.

NRC/SAIC COMMENT

This HED was identified in the October 1985 SR and at the June 1986 audit as being corrected during the first refueling outage. The subsequent April 21, 1987 CECO letter, however, indicates that the corrective action for this HED will be implemented by the second refueling outage. CECO should provide acceptable justification for the proposed delay in implementation.

CECO CLARIFICATION

It is Commonwealth Edison's intention to implement a comprehensive and integrated background shading, mimic and line of demarcation program. To allow for sufficient time to design coordinate and integrate the program an implementation date of the second outage was specified. The corrective action for this HED entails shading and was consequently incorporated into that program which necessitated a change in the implementation date.

IMPLEMENTATION
1ST REFUELING OUTAGE

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 144
HED CATEGORY 1B
FSR PAGE 186

FINDING

Control positions for three key-operated controls are missing or inappropriate. (Photo Log No. A-32)

RESPONSE

The cited switches will be labeled.

NRC/SAIC COMMENT

This HED was identified in the October 1985 SR and at the June 1986 audit as being corrected during the first refueling outage. The subsequent April 21, 1987 CECO letter, however, indicates that the corrective action for this HED will be implemented by the second refueling outage. CECO should provide acceptable justification for the proposed delay in implementation.

CECO CLARIFICATION

The cited switches have been labeled. Corrective action for this HED is complete.

IMPLEMENTATION
1ST REFUELING OUTAGE

REVISED IMPLEMENTATION
COMPLETED

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 152
HED CATEGORY 2C
FSR PAGE 187

FINDING

On continuous adjustment rotary controls, there is no pointer indicator on the control knob. Instead, the pointer indicator is on the knob skirt.
(Photo Log No. A-33)

RESPONSE

A white dot will be added to the control knob as a pointer.

NRC/SAIC COMMENT

This HED was identified in the October 1985 SR and at the June 1986 audit as being corrected during the first refueling outage. The subsequent April 21, 1987 CEC Co letter, however, indicates that the corrective action for this HED will be implemented by the second refueling outage. CEC Co should provide acceptable justification for the proposed delay in implementation.

CEC Co CLARIFICATION

Feedback to the operator concerning Generator Volt adjustment is provided via volt indicators on the vertical section of the panel above the cited control switch. In fact, the operator "adjusts" voltage to a specific level via that indicator and does not "set" the voltage adjust control switch to any particular, predetermined position so that the actual position of the switch, per se, is irrelevant. Nonetheless, a white dot will be added to the control knob as a pointer by the first refueling outage.

IMPLEMENTATION
1ST REFUELING OUTAGE

REVISED IMPLEMENTATION
1ST REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 162
HED CATEGORY 1B
FSR PAGE 231

FINDING

Successive values indicated by unit graduations on three control room meters and recorders are other than those recommended by the guideline. Recommended values are 5, 10, 15, 20, or 2, 4, 6, 8, 10, or 1, 2, 3, 4, 5, or some multiple of these values by 10. These scale markings are difficult for the operator to interpret. (Photo Log No. B-16)

RESPONSE

The reactor core isolation cooling pump pressure suction and the low pressure core spray pump amperes meters (on H13-P601) are not time-critical instruments. They are well labeled and the operators report no difficulties with their use.

The air temperatures for the drywell suppression temperature recorder will be relocated to a new meter and marked with the recommended unit graduations.

NRC/SAIC COMMENT

The category should be changed to category I and the schedule for implementation of the corrective action should be advanced.

CECO CLARIFICATION

The category has been changed to category I. However, the corrective action for this HED entails a change to components on the PM13J panel, the Containment Monitoring panel. That panel is scheduled to undergo complete redesign in response to other HEDs associated with it. As part of its commitment to the NRC, CECO intends to implement corrective actions in a rigorous, integrated, and coordinated fashion so as to preclude introduction of additional HEDs and to ensure as well a Human Engineered control room as is retrospectively possible. Given the engineering and manufacturing lead time necessary to redesign it, a second refueling outage implementation date has been made.

IMPLEMENTATION
2ND REFUELING OUTAGE

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

Commonwealth Edison Company's Revised Response/Clarification
to HEDs Referred to in the NRC's Safety Evaluation (SE) Report
of the LaSalle County Station DCRDR

Safety Evaluation Report - Enclosure A
Revised Responses
(SER Encl. A)

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 20
HED CATEGORY 2C
FSR PAGE 103

FINDING

Telephones on some control room panels (PM02J, H13-P601, PM05J) have cords resting on the floor. (Photo Log No. G-21, G-22)

RESPONSE

The telephone cords are stretched across the floor due to the current lack of telephones on the N62-P600 and N62-P601 panels. Telephones will be added to these panels.

NRC/SAIC COMMENT

While the action indicated in the response will ensure that enough telephones will be available in the control room, CECO does not indicate it will take corrective action on the existing long phone cords.

CECO CLARIFICATION

The existing long phone cords will be replaced with shorter phone cords to reduce the tripping hazard. This action, in concert with the addition of more phones, will ensure adequate and safe communication capability for the operator.

IMPLEMENTATION
2ND REFUELING OUTAGE

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 468 & 337
HED CATEGORY 2A
FSR PAGE 5

FINDING

During the task analysis and verification, tasks were identified in which the operator was required to determine the scram air header pressure. There is an annunciator in the control room to inform the operator that the pressure is either too high or too low, but there is no indication in the control room of actual pressure. The addition of a display for the scram air header pressure would facilitate operations.

RESPONSE

The scram air header pressure annunciator will be split into a low pressure and a high pressure alarm. Due to the complexity of this engineering modification, it will be completed by the second refueling outage.

NRC/SAIC COMMENT

Currently, there is no direct indication of scram air header pressure available in the control room. The proposed split annunciator alarm would not provide the operator with the required direct indication of scram air header pressure.

CECO CLARIFICATION

The HEDAT reevaluated this HED. The tasks requiring the display of the scram air header pressure were concerned with bleeding air pressure off the scram air header as an alternate means of scrambling the reactor in an ATWS type event. In the BWR Owners Group EPG's this approach was provided as an alternate and was similarly adopted by the station in its EOPs as one of many alternate rod insertion techniques. Station management would make the decision as to which approach to take in this type of an event. Time would exist for Equipment Attendants to go to the local panel, where adequate indication of scram air header pressure exists, to carry out the sequence of steps necessary to accomplish the task. The HEDAT feels that though the indication would be "nice to have" in the control room it is not necessary to accomplish the EOP tasks and that from the control room operators perspective the availability of a "High" and a "Low" annunciator is sufficient.

IMPLEMENTATION
2ND REFUELING OUTAGE

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 260
HED CATEGORY 2B
FSR PAGE 412

FINDING

The "feedwater turbine handjack" and the "feedwater turbine speed ISI-FW046" on Unit 1 have been combined into one piece of equipment for 1A and 1B on Unit Two - "Lovejoy Control Corporation (LCC) reactor feed pump turbine (RFPT) 2A control startup station". Unit One and Unit Two should have the same arrangement. (Photo Log No. D-38, D-38.1, D-39, D-39.1)

RESPONSE

An evaluation is underway to determine if the Unit Two equipment (lovejoy control system) is better than the Unit One equipment (General Electric). The Unit One equipment will not be changed until it is proved that the Unit Two equipment is superior (based on system performance).

NRC/SAIC COMMENT

Unit 1 and Unit 2 have different control mechanisms for similar systems. At present, CECo is evaluating the control mechanisms, after which the superior equipment will be implemented. The CECo implementation schedule, however, indicated that no action will be taken ("accept as is").

CECO CLARIFICATION

If one system is demonstratively superior to the other, that system will be implemented on the sister unit. The HEDAT anticipates the evaluations to be completed in time to install the superior system, if there is one, by the completion of the second outage.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 248 & 397
HED CATEGORY 2A
FSR PAGE 139

FINDING

A prioritization scheme is not in place for the annunciator system.

RESPONSE

A prioritization scheme will be implemented to improve annunciators.

NRC/SAIC COMMENT

According to CECc's implementation schedule, a Category 2-A HED should be completed by the end of the first refueling outage.

CECO CLARIFICATION

The REDAT has reevaluated the HEDs associated with the Station's annunciator system. As a result, a comprehensive and integrated program will be implemented to review the content of each annunciator tile to ensure it corresponds to the Station's accepted Abbreviation Standard. Those that do not will then be reengraved so as to comply with the CECc Human Factors Engineering Design criteria. Concurrently, the tile's content will be evaluated by an operations Subject Matter Expert (SME) and a Human Factors Specialist (HFS) to determine which are time critical and of high priority. Those so designated will have a red border around the perimeter of the tile. Given the extensive nature of this program, a second refueling outage commitment date is required.

IMPLEMENTATION
2ND REFUELING OUTAGE

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 498, 395 & 451
LED CATEGORY 1A
FSR PAGE 150

FINDING

Some annunciators have legends which are not specific and unambiguous.

RESPONSE

The cited tiles will be reworded to provide unambiguous legends. The present annunciator wording has not caused any problems due to operator misunderstanding. The annunciator tiles mentioned will be corrected as the tiles are revised for other reasons.

NRC/SAIC COMMENT

CECo does not intend to change the existing tiles until they need to be replaced for another reason. CECo should review the annunciators and implement corrective actions for those that warrant correction immediately.

CECO CLARIFICATION

The HEDAT has reevaluated the HEDs associated with the Station's annunciator system. As a result, a comprehensive and integrated program will be implemented to review the content of each annunciator tile to ensure it corresponds to the Station's accepted Abbreviation Standard. Those that do not will then be reengraved so as to comply with the CECo Human Factors Engineering Design criteria. Concurrently, the tile's content will be evaluated by an operations Subject Matter Expert (SME) and a Human Factors Specialist (HFS) to determine which are time critical and of high priority. Those so designated will have a red border around the perimeter of the tile. Given the extensive nature of this program, a second refueling outage commitment date is required.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 495
HED CATEGORY 2B
FSR PAGE 153

FINDING

Abbreviations and acronyms used on annunciators are not consistent with others used in the control room.

RESPONSE

A standardized abbreviation list is being developed and implemented to legends for all new annunciator tiles.

NRC/SAIC COMMENT

CECo does not intend to change the existing tiles until they need to be replaced for another reason. CECo should review the annunciators and implement corrective actions for those that warrant correction immediately.

CECO CLARIFICATION

The HEDAT has reevaluated the HEDs associated with the Station's annunciator system. As a result, a comprehensive and integrated program will be implemented to review the content of each annunciator tile to ensure it corresponds to the Station's accepted Abbreviation Standard. Those that do not will then be reengraved so as to comply with the CECo Human Factors Engineering Design criteria. Concurrently, the tile's content will be evaluated by an operations Subject Matter Expert (SME) and a Human Factors Specialist (HFS) to determine which are time critical and of high priority. Those so designated will have a red border around the perimeter of the tile. Given the extensive nature of this program, a second refueling outage commitment date is required.

IMPLEMENTATION
1ST REFUELING OUTAGE

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 204 & 198
HED CATEGORY 2B
FSR PAGE 154

FINDING

Letter height on annunciator tiles is not identical for all tiles.

RESPONSE

Operators report no difficulty in reading annunciator tiles. However, standards for annunciator tiles (letter height, width, stroke-width, etc.) will be incorporated into a procedure and will be used on all subsequent annunciator tile engravings.

NRC/SAIC COMMENT

CECo does not intend to change the existing tiles until they need to be replaced for another reason. CECo should review the annunciators and implement corrective actions for those that warrant correction immediately.

CECO CLARIFICATION

The HEDAT has reevaluated the HEDs associated with the Station's annunciator system. As a result, a comprehensive and integrated program will be implemented to review the content of each annunciator tile to ensure it corresponds to the Station's accepted Abbreviation Standard. Those that do not will then be reengraved so as to comply with the CECo Human Factors Engineering Design criteria. Concurrently, the tile's content will be evaluated by an operations Subject Matter Expert (SME) and a Human Factors Specialist (HFS) to determine which are time critical and of high priority. Those so designated will have a red border around the perimeter of the tile. Given the extensive nature of this program, a second refueling outage commitment date is required.

IMPLEMENTATION
1ST REFUELING OUTAGE

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 200
HED CATEGORY 2B
FSR PAGE 156

FINDING

The minimum space between characters on many annunciator tiles is not at least one stroke width.

RESPONSE

Standards will be included in a procedure for the letter dimensions for annunciator tiles. All new annunciator tiles will comply with this standard.

NRC/SAIC COMMENT

CECo does not intend to change the existing tiles until they need to be replaced for another reason. CECo should review the annunciators and implement corrective actions for those that warrant correction immediately.

CECO CLARIFICATION

The HEDAT has reevaluated the HEDs associated with the Station's annunciator system. As a result, a comprehensive and integrated program will be implemented to review the content of each annunciator tile to ensure it corresponds to the Station's accepted Abbreviation Standard. Those that do not will then be reengraved so as to comply with the CECo Human Factors Engineering Design criteria. Concurrently, the tile's content will be evaluated by an operations Subject Matter Expert (SME) and a Human Factors Specialist (HFS) to determine which are time critical and of high priority. Those so designated will have a red border around the perimeter of the tile. Given the extensive nature of this program, a second refueling outage commitment date is required.

IMPLEMENTATION
1ST REFUELING OUTAGE

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCDR.

HED # 201
HED CATEGORY 2B
FSR PAGE 157

FINDING

The minimum space between words on some annunciator tiles does not meet the guideline of one character width.

RESPONSE

Standards will be included in a procedure for the letter dimensions for annunciator tiles. All new annunciator tiles will comply with the standard.

NRC/SAIC COMMENT

CECo does not intend to change the existing tiles until they need to be replaced for another reason. CECo should review the annunciators and implement corrective actions for those that warrant correction immediately.

CECO CLARIFICATION

The HEDAT has reevaluated the HEDs associated with the Station's annunciator system. As a result, a comprehensive and integrated program will be implemented to review the content of each annunciator tile to ensure it corresponds to the Station's accepted Abbreviation Standard. Those that do not will then be reengraved so as to comply with the CECo Human Factors Engineering Design criteria. Concurrently, the tile's content will be evaluated by an operations Subject Matter Expert (SME) and a Human Factors Specialist (HFS) to determine which are time critical and of high priority. Those so designated will have a red border around the perimeter of the tile. Given the extensive nature of this program, a second refueling outage commitment date is required.

IMPLEMENTATION

1ST REFUELING OUTAGE

REVISED IMPLEMENTATION

2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 202
HED CATEGORY 2B
FSR PAGE 158

FINDING

The space between lines on some annunciator tiles does not meet the recommended guideline of one-half the character height. (Photo Log No. I-18)

RESPONSE

Standards will be included in a procedure for the letter dimensions for annunciator tiles. All new annunciator tiles will comply with the standard.

NRC/SAIC COMMENT

CECo does not intend to change the existing tiles until they need to be replaced for another reason. CECo should review the annunciators and implement corrective actions for those that warrant correction immediately.

CECO CLARIFICATION

The HEDAT has reevaluated the HEDs associated with the Station's annunciator system. As a result, a comprehensive and integrated program will be implemented to review the content of each annunciator tile to ensure it corresponds to the Station's accepted Abbreviation Standard. Those that do not will then be reengraved so as to comply with the CECo Human Factors Engineering Design criteria. Concurrently, the tile's content will be evaluated by an operations Subject Matter Expert (SME) and a Human Factors Specialist (HFS) to determine which are time critical and of high priority. Those so designated will have a Red border around the perimeter of the tile. Given the extensive nature of this program, a second refueling outage commitment date is required.

IMPLEMENTATION
NOT APPLICABLE

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 115
HED CATEGORY 3C
FSR PAGE 51

FINDING

The 2H13-P603, 1H13-P635, 2H13-P635 and 1H13-P604 panels have missing panel sections in which unwanted objects may enter. (Photo Log No. G-1, G-2, G-3, G-4, G-5)

RESPONSE

Missing panel sections will be replaced.

NRC/SAIC COMMENT

The proposed corrective action has significant engineering requirements which necessitate a delay in implementation. However, CECo should implement a temporary corrective measure in the interim.

ECO CLARIFICATION

Commonwealth Edison Company felt subsequent to the HEDAT that this problem deserved immediate attention. Therefore, the missing panel sections cited in the HED have been corrected.

IMPLEMENTATION
2ND REFUELING OUTAGE

REVISED IMPLEMENTATION
COMPLETED

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 398, 360, 364, 366, 51, 57, 75, 551, 64, 48 & 401
HED CATEGORY 1A
FSR PAGE 160

FINDING

Instrumentation on the electrical panel (PM01J) is not functionally grouped. Specifically, AC distribution, diesel generator, synchronization scope and oil circuit breaker instrumentation are not functionally grouped.

In addition, the feeds on buses 141 and 142 are not the same, i.e., left corresponds to station auxiliary transformer (SAT) on one and unit auxiliary transformer (UAT) on the other. (Photo Log No. D-11, D-11.1, D-21, E-25, E-15, C-36)

RESPONSE

A modification has been approved for PM01J. This panel will be reorganized and enhancements added to clarify functional groupings. An integrated approach will be used for the modifications. Due to the complexity of this panel and the proposed changes, this modification will be completed by the second refueling outage.

NRC/SAIC COMMENT

The proposed corrective action has significant engineering requirements which necessitate a delay in implementation. However, CECO should implement a temporary corrective measure in the interim.

CECO CLARIFICATION

Background shading, mimics, and lines of demarcation currently exist on the PM01J panel to aid the operator in the performance of duties at this panel. This is considered by the HEDAT to be adequate "corrective" measures in the interim before panel redesign.

IMPLEMENTATION
2ND REFUELING OUTAGE

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCDR.

HED # 286, 478, 371, 197, 362, 372 & 476
HED CATEGORY 1A
FSR PAGE 363

FINDING

There are three major systems located on the PM13J panel - continuous monitoring, accident monitoring and humidity monitoring. Controls and displays for these systems are not grouped by task sequence or frequency of use and systems are difficult to identify. (Photo Log No. C-28, C-28.1, C-29)

RESPONSE

Suitable enhancements (background shading, demarcation) will be added to PM13J to clarify functional groupings. Instrumentation will also be rearranged as necessary to enhance groupings.

NRC/SAIC COMMENT

The proposed corrective action is not specified in sufficient detail to allow a rigorous verification. Also, the engineering requirements for such a modification necessitate a delay in implementation. CECO should implement a temporary corrective action in the interim.

CECO CLARIFICATION

The PM13J panel will be replaced and will be redesigned to enhance functional groupings and the use of displays and controls. Background shading and demarcation will also be used to enhance functional groupings. Labels will be used to identify equipment and systems. Given the functional importance of this panel for both normal and abnormal operations a significant amount of engineering lead time is required to ensure the panel redesign is implemented in a safe and integrated fashion without creating additional HEDs. An effort will be made to complete the implementation by the second outage. It may not be possible to implement these changes on Unit 1 by that date. In the interim, labels will be placed by the existing equipment to more clearly identify function and temporary lines of demarcation will be added to separate systems.

IMPLEMENTATION
2ND REFUELING OUTAGE

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 87
HED CATEGORY 1A
FSR PAGE 424

FINDING

There are meters, located on PM02J and PM01J, which are arranged in unbroken rows containing more than five meters. (Photo Log. No. E-12, E-12.1)

RESPONSE

Although the meters are physically located in unbroken rows, labeling techniques perceptually break up the rows of displays. In addition, enhancements will be added to PM01J to clarify functional groupings. Due to the complexity of this panel and the proposed changes, this modification will be completed by the second refueling outage.

NRC/SAIC COMMENT

The proposed corrective action has significant engineering requirements which necessitate a delay in implementation. However, CECO should implement a temporary corrective measure in the interim.

CECO CLARIFICATION

Although the meters are physically located in unbroken rows, labeling techniques perceptually break up the rows of displays. Moreover, background shading, mimics, and lines of demarcation currently exist on the PM01J panel to aid the operator in the performance of duties at this panel. This is considered by the HEDAT to be adequate "corrective" measures in the interim before panel redesign, which because of the complexity of this panel and the proposed changes, will be completed by the second refueling outage.

IMPLEMENTATION
2ND REFUELING OUTAGE

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 235
HED CATEGORY 1A
FSR PAGE 430

FINDING

The synchroscope lights and associated indicators are not sufficiently close enough to the turbine generator to permit the operators to clearly read the displays when synchronizing the turbine generator to the grid. (Photo Log No. D-17, E-12)

RESPONSE

A modification has been approved for PMO1J. The panel will be reorganized and enhancements added to clarify functional groupings. Due to the complexity of this panel and the proposed changes, this modification will be completed by the second refueling outage.

NRC/SAIC COMMENT

The proposed corrective action has significant engineering requirements which necessitate a delay in implementation. However, CECO should implement a temporary corrective measure in the interim.

CECO CLARIFICATION

Reevaluation of this problem by the HEDAT resulted in concurrence with the NRC's comments. A supervising relay has been installed to assure proper synchronization of the turbine to the grid.

IMPLEMENTATION
2ND REFUELING OUTAGE

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 297 & 298
HED CATEGORY 3C
FSR PAGE 61

FINDING

The highest controls on the vertical portion of the benchboards are not within reach radius of the standing 5th percentile female. (Photo Log No. G-20)

RESPONSE

Guardrails are in place to protect controls from inadvertent actuation if the 5th percentile female must use an extended reach or stretch position to activate controls. In addition, an ergonomically designed stepladder will be provided in the control room whenever any 5th percentile females are assigned control room duties.

NRC/SAIC COMMENT

The reviewers are concerned that the use of stepladders would aggravate the situation rather than improve it. CECO should determine which controls must be manipulated in a time-critical situation and provide an appropriate corrective action.

CECO CLARIFICATION

A comprehensive review of the control room panels was performed by a HFS and an SME to identify all the controls and displays outside the envelopes specified in the CECO checklist. Those controls/displays were compared to the DCRDR Task Analysis data base to determine whether any were identified as required to mitigate a transient event. Relevant tasks were evaluated and SME input was utilized to ascertain which instruments might be used in a time critical fashion. No controls with a time critical function were discerned. Given that guardrails exist that will prevent inadvertent actuation of controls in the cases where an operator must lean over the panels slightly in order to manipulate a control, none of the non time critical controls will be relocated. Displays outside the envelope that may have to be read in a time critical sense will be zone banded so that operators can determine at a glance whether the parameter is in a normal or

abnormal range. The ergonomically designed stepladder was never intended for operator use in time critical situations. Rather, it was intended to be used to facilitate operator job performance in non time critical situations, such as replacing annunciator light bulbs.

IMPLEMENTATION
1ST REFUELING OUTAGE

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

HID # 69
HED CATEGORY 1C
FSR-PAGE 72

Referenced on Page: SER Encl. 1-6

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 40
HED CATEGORY 2C
FSR PAGE 74

FINDING

Some displays on vertical panels in the main control room are located in an area outside the recommended 41" and 70" (above the floor) envelope. (Photo Log No. A-12, A-12.1 thru A-12.6)

RESPONSE

Although these displays slightly deviate from the guideline recommendations, none are used for monitoring safety-related equipment and, therefore, have a negligible impact on performance. An ergonomically designed stepladder will be provided for use on these panels.

NRC/SAIC COMMENT

The reviewers are concerned that the use of stepladders would aggravate the situation rather than improve it. CECO should determine which displays must be read in a time-critical situation and provide an appropriate corrective action.

CECO CLARIFICATION

The following displays are cited in both the HED and in the task analysis:

- "PRIMARY CONT WATER CHILLER PUMP 2B" (PM06J)
- "DRYWELL VENT/PURGE OUTLET VALVE" (indicator lights; PM06J)
- "RECOMBINER A INLET TEMP" (N62-P600)
- "DW HUMIDITY SAMPLE A OUTBD ISOL VALVES & PUMP" (PM13J)
- "DRYWELL SUCT 2CM022A" (indicator lights; PM13J)
- "POST LOCA H2/O2 MON SYS" (indicator lights; PM13J)
- "OFF STANDBY ANALYZE" (indicator lights; PM13J)
- "POST LOCA CNMT MON SYS A HIGH H2" (indicator lights; PM13J)
- "TURB STOP VALVE SCRAM TRIP BYPS RELY" (H13-P611)

The cited displays are examples. A comprehensive review of the control room panels was performed by a HFS and an SME to identify all the controls and displays outside the envelopes specified in the CECO checklist. Those controls/displays were compared to the DCRDR Task Analysis data base to determine whether any were identified as required to mitigate a transient event. Relevant tasks were evaluated and SME input was utilized to ascertain which instruments might be used in a time critical fashion. No controls with a time critical function were discerned. Given that guardrails exist that will prevent inadvertent actuation of controls in the cases where an operator must lean over the panels slightly in order to manipulate a control, none of the non time critical controls will be relocated. Displays outside the envelope that may have to be read in a time

critical sense will be zone banded so that operators can determine at a glance whether the parameter is in a normal or abnormal range. The ergonomically designed stepladder was never intended for operator use in time critical situations. Rather, it was intended to be used to facilitate operator job performance in non time critical situations, such as replacing annunciator light bulbs.

IMPLEMENTATION
1ST REFUELING OUTAGE

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 376
HED CATEGORY 1C
FSR PAGE 75

FINDING

Back panel equipment is difficult to monitor because an operator has to be relieved by another in order to go back and check them; some back panel recorders are too high.

RESPONSE

Adequate control room staffing provides for extra personnel to monitor back panel indications. Back panel instrumentation (specifically recorders) is non-time-critical to monitor. An ergonomically designed stepladder will be provided for use on these panels.

NRC/SAIC COMMENT

The reviewers are concerned that the use of stepladders would aggravate the situation rather than improve it. CECO should determine which controls must be manipulated in a time-critical situation and provide an appropriate corrective action.

CECO CLARIFICATION

The only potentially time-critical instrumentation on the back panels are the radiation monitors. However, redundant indications are provided in the primary operating area in the form of radiation alarms and computer displays and printouts. The stepladder would not have been used during time-critical situations on the back panel as all time-critical information is presented in the primary operating area.

IMPLEMENTATION
1ST REFUELING OUTAGE

REVISED IMPLEMENTATION
1ST REFUELING OUTAGE

HED # 10
HED CATEGORY 1C
FSR-PAGE 82

Referenced on Page: SER Encl. 1-8

HED # 286
HED CATEGORY 1A
FSR-PAGE 362

Referenced on Page: SER Encl. A-13

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 46
HED CATEGORY 2C
FSR PAGE 370

FINDING

The turbine bearing lift pumps, turbine turning gear, turbine oil reservoir vapor extractor, turbine main shaft suction pump, and turbine turning gear oil pump controls (on PM02J) are functionally related and poorly grouped. (Photo Log No. C-34)

RESPONSE

Background shading will be added to the PM02J panel to ensure functional groupings. All background shading modifications will be coordinated with other corrective actions (relocations, demarcation, mimics) to ensure that new HEDs will not be created.

NRC/SAIC COMMENT

The proposed corrective action is a conceptual solution and is not specified in sufficient detail to permit a rigorous verification.

CECO CLARIFICATION

The cited turbine controls will share the same color of background shading to enhance their functional relations to one another. The background shading modification will be integrated with other corrective actions to ensure that new HEDs will not be created.

IMPLEMENTATION
2ND REFUELING OUTAGE

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

Commonwealth Edison Company's Revised Response/Clarification
to HEDs Referred to in the NRC's Safety Evaluation (SE) Report
of the LaSalle County Station DCRDR

Safety Evaluation Report - Enclosure B (TER)
Revised Responses
(TER Append. A1)

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 375
HED CATEGORY 2C
FSR PAGE 41

FINDING

Off gas pre- and post-treatment radiation chart recorders should be moved to the off gas front panels. This would help in correlating off gas system changes to the change in pre/post treatment radiation changes.

RESPONSE

The placement of off gas pre- and post-treatment recorders on back panels is acceptable because they are not used during time-critical or emergency situations.

NRC/SAIC COMMENT

The justification for not correcting this HED, and/or the description of the discrepancy, is too brief, ambiguous, or general to allow an adequate evaluation to be made.

CECO CLARIFICATION

The Pre- and Post- Treatment Off Gas Radiation recorders located on the H13-P604 backpanel record rad levels in the off gas system before and after treatment. As such they are functionally related to the radiation detection system as opposed to the off gas system. Consequently, they were located with the radiation release detection equipment on the H13-P604 backpanel. Nonetheless, they are readily available from the Off Gas panel in situations requiring their use. Moreover, information displayed on the recorders is available from the computer if necessary. Relocation of the "discrepant" recorders from the backpanel area to the Off Gas panel is therefore not warranted.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 8, 266 & 518
HED CATEGORY 2B
FSR PAGE 81

FINDING

The status of plant equipment under the control of one unit is not displayed on the other unit which is capable of controlling that equipment.

RESPONSE

Common system equipment is controlled by one of the respective units. Since it is the specific unit's responsibility, current placement is appropriate.

NRC/SAIC COMMENT

The justification for not correcting this HED, and/or the description of the discrepancy, is too brief, ambiguous, or general to allow an adequate evaluation to be made.

DECO CLARIFICATION

The HEDAT feels the description of the HED Finding is erroneous given the equipment cited in the HEDs. That equipment is common equipment, ie., that equipment that can be used on either unit. Specifically cited were the common station air compressor, the clean condensate pumps, the well water pumps, the common RBCCW pump, the diesel fire pumps, and the common service water pumps. The controls and displays for this equipment are located on one of the two units, but not both. Hence, both units are not capable of controlling the equipment as the finding suggests. When the equipment is needed on the unit not having control of the equipment, it is run for the unit by the sister unit. As is the case with all system equipment, training and procedure govern the use of the common equipment.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 507 & 508
HED CATEGORY 2C
FSR PAGE 89

FINDING

Some control room panel surface colors, background shadings, mimics and label colors have luminance ratios which exceed the maximum of 3:1 for task area vs. adjacent darker surroundings or 1:3 for task area vs. adjacent lighter surroundings.

RESPONSE

Color luminance is a factor in operations when colors are not easily discriminable and recognizable. All colors in the control room are recognizable to the operators. They report no difficulties in the chosen colors.

NRC/SAIC COMMENT

The justification for not correcting this HED, and/or the description of the discrepancy, is too brief, ambiguous, or general to allow an adequate evaluation to be made.

CECO CLARIFICATION

Color luminance is a factor in workspace design when colors are used for coding purposes and must be readily and easily discriminable and recognizable. Control panel colors at LaSalle were used for background shading purposes only. No coding is implied. In addition, the purpose of the background shading is to highlight functional control/display relationships which the current scheme accomplishes. No modifications are warranted.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 412
HED CATEGORY 2C
FSR PAGE 282

FINDING

There is some confusion as to what points of the system are being monitored on the off gas panel (N62-P600).

RESPONSE

Control room operators are adequately trained to identify system points.

NRC/SAIC COMMENT

The justification for not correcting this HED, and/or the description of the discrepancy, is too brief, ambiguous, or general to allow an adequate evaluation to be made.

CECO CLARIFICATION

The original HED concerned the addition of mimics to the Off Gas instrument panel, N62-P600, to enhance its use. The panel consists primarily of recorders and indicators to display SJAE pressures and flows, recombiner temperatures, adsorber temperatures, off gas flows, moisture separator temperatures, and off gas filter differential pressures. The panel is uncluttered, and well labeled. Operators receive adequate training on the off gas system, its use, and its controls.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 132
HED CATEGORY 2C
FSR PAGE 355

FINDING

Red and green are used in combination on CRT displays. According to criteria, this practice should be used as little as possible.

RESPONSE

Red and green are generally used for opposite meanings and are therefore rarely used together. In addition, shape and position cues provide redundant information to the operators.

NRC/SAIC COMMENT

The justification for not correcting this HED, and/or the description of the discrepancy, is too brief, ambiguous, or general to allow an adequate evaluation to be made.

CECO CLARIFICATION

LaSalle station adheres to a green board color coding convention in which the color "green" denotes a "Normal" condition and the color "red" denotes an "Abnormal" condition when the unit is above 30% power. The CECco computer display conventions currently do not use green board coding, which in part accounts for the cited discrepancy. The feasibility of using green board coding for the computer graphics is being explored at CECco's Byron PWR station. Several displays have been modified and their use is being evaluated. One problem is that green board coding does not provide for indication of equipment status beyond normal/abnormal, for example, open/closed, on/off, etc. Resolutions to this problem are being evaluated. When the "green board convention" computer graphics problems have been successfully resolved at Byron, the convention will be implemented at LaSalle if feasible.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

Commonwealth Edison Company's Revised Response/Clarification
to HEDs Referred to in the NRC's Safety Evaluation (SE) Report
of the LaSalle County Station DCRDR

Safety Evaluation Report - Enclosure B (TER)
Revised Responses
(TER Append. A2)

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 463, 467, 492 & 234
HED CATEGORY 1A
FSR PAGE 10

FINDING

During the task analysis and verification, it was observed that there are tasks performed using emergency systems on the H13-P601 panel in which the operator is required to ascertain drywell pressure and suppression pool level. Current indication is located on the PM06J panel (narrow range) and the PM13J panel (wide range) for drywell pressure and PM13J for suppression pool level. Operators should have ready access to these parameters on the H13-P601 panel to facilitate emergency operations. (Photo Log No. F-29)

RESPONSE

Under accident conditions, one operator is assigned to monitor containment conditions of pressure, temperature and water level, and initiate actions when directed to by the emergency procedures. Most of these actions are required when the parameters reach graphical limit rather than at any single value. The other operator at H13-P601 is responsible for maintaining and restoring vessel level and monitoring associated parameters. This information is also available on the SPDS. Staffing levels are adequate to monitor and coordinate all appropriate information within the required time limits.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

CECO CLARIFICATION

Though staffing levels are adequate to address the EOP tasks requiring Drywell Pressure and Suppression Pool Level information, and though no operational problems concerning Drywell Pressure and Suppression Pool Level information being received in a timely manner have been encountered when the EOPs have been implemented, a wide range Drywell Pressure and Suppression Pool Level indicator will be placed on the H13-P601 panel. However, since the 1E instrumentation requirements for this safety related information are

met by the indicators on the PM13J panel the displays to be placed on the H13-P601 panel may not necessarily meet those criteria. In addition, since this corretive action involves structural modification to an ESF panel, an implementation date of the second refueling outage is necessary to allow for sufficient engineering lead time.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 193
HED CATEGORY 2C
FSR PAGE 29

FINDING

It was noted during the validation that there is no indication of flow for the chiller fans.

RESPONSE

The need for chiller fan flow is not time critical and only used for troubleshooting.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

CECO CLARIFICATION

The chiller system is not a safety related system. Any need for chiller fan flow information is not time critical, that is, time exists to dispatch an operator to the local panel to obtain the necessary information. Moreover, no remedial action can be taken from the control room in instances of system malfunction and an operator would have to be dispatched regardless. Therefore, no operational benefit would be derived from the installation of a chiller fan flow indicator.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 195
HED CATEGORY 2B
FSR PAGE 30

FINDING

During the validation, it was observed that the primary containment chillers could not be started from the main control room. The unavailability of a control switch for the chiller could delay operation of the primary containment ventilation system.

RESPONSE

The primary containment chiller system is designed so that it cannot be started from the control room, to insure that the system is not reset before the cause of the trip is identified. Safe startup of the chillers requires an operator in attendance at the equipment to monitor operator parameters.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

CECO CLARIFICATION

The Primary Containment Chiller system is not a safety related system. It was nonetheless designed so that it cannot be started from the control room in order to insure that the system will not be reset after a trip until the cause of the trip is identified and corrected. Otherwise, serious damage could be done to the system. A safe startup of the chillers requires an operator in attendance at the local panel to monitor locally displayed operational parameters. All procedures requiring the operation of the Chiller system are non time-critical, meaning sufficient time exists to dispatch an operator to the local panel to operate the system.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 301
HED CATEGORY 2C
FSR PAGE 70

FINDING

The display face angle from the line of sight of the seated 5th percentile female to the annunciator (on the reactor panel) is less than the required 45 degrees.

RESPONSE

This panel is actually a sit/stand console, designed to be operated from a standing or seated position. All controls are within the reach radius of an operator in a standing position.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

CECO CLARIFICATION

The reactor panel is a sit/stand panel. Space allocations for sitting were designed and built into the panel to allow operators to sit and monitor reactor power parameters when manipulating control rods during startups and shutdowns. When that job task is being performed another operator is available on the unit to assist. Moreover, by procedure and training, when an alarm comes up the operator is required to stop manipulating rods and respond to the alarm as dictated in the annunciator response procedure. In order to respond to the alarm the operator is required to get up from a seated position. From a standing position the annunciators comply with the line of sight criteria. The HEDAT feels the discrepancy documents a non problem and consequently no corrective action is necessary.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 141 & 142
HED CATEGORY 1B
FSR PAGE 184

FINDING

Some key-operated controls are not required since the function being controlled is not necessary to be secured against activation by unauthorized personnel. Some key-operated controls have the key inserted in them during all operations. (Photo Log No. A-29, A-30)

RESPONSE

The key-operated controls are designed so that in the cases where security is an issue, the keys can be removed from the locks and controlled. The key-operated controls also indicate an additional caution to the operators that these are safety related controls. The keys do not impede operations.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

CECO CLARIFICATION

The HEDAT reevaluated these HEDs and concurs with the NRC's comments. There is no longer a need to secure the components cited in the discrepancies and the switches will therefore be replaced with ones more appropriate to the components functions. Due to the necessary engineering lead time and the proximity of the first refueling outage this corrective action will be implemented by the end of the second outage.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 146
HED CATEGORY 2C
FSR PAGE 190

FINDING

The diesel generator feed and bus diesel generator feed rotary controls have position indications painted on the top of the knob. It is difficult to tell which position the control is in. (Photo Log No. A-36)

RESPONSE

The two detents (trip, close) available for this switch are 90 degrees apart. This distance is sufficient to insure rapid identification of position.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

CECO CLARIFICATION

The cited controls have two detents at the 10 O'Clock and 2 O'Clock positions. In accordance with the LaSalle Station Position Coding Convention, the Trip function is at the 10 O'Clock position and the Close function is at the 2 O'Clock position. The control remains where it is placed. The detents are appropriately labeled and a white line has been painted on the black knob surface to reinforce knob position. Indicator lights located directly above the controls illuminate to further identify the position/condition of the switches and the breakers they control. No additional action is required.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

HED # 162
HED CATEGORY 3B
FSR-PAGE 231

Referenced on Page: SER Encl. 1-13

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 181
HED CATEGORY 2B
FSR PAGE 236

FINDING

Meaning attached to a particular color is not narrowly defined and is not consistent across application in the control room.

RESPONSE

A green board concept is used for plant indication lights. Other uses of color are not confusing to the operators since they are trained in the use of color. Additionally, multiple coding techniques are used for instrumentation throughout the control room.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

CECO CLARIFICATION

LaSalle station adheres to a green board color coding convention in which the color "green" denotes a "Normal" condition and the color "red" denotes an "Abnormal" condition when the unit is above 30% power. The CECO computer display conventions currently do not use green board coding, which in part accounts for the cited discrepancy. The feasibility of using green board coding for the computer graphics is being explored at CECO's Byron PWR station. Several displays have been modified and their use is being evaluated. One problem is that green board coding does not provide for indication of equipment status beyond normal/abnormal, for example, open/closed, on/off, etc. Resolutions to this problem are being evaluated.

When the "green board convention" computer graphics problems have been successfully resolved at Byron, the convention will be implemented at LaSalle if feasible.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 344 & 462
HED CATEGORY 3B
FSR PAGE 238

FINDING

Green banding should be in place for all normal operating ranges for all recorders and indicators. (Photo Log. No. G-24, G-25, G-26)

RESPONSE

Green banding will be added to all instrumentation where it would be appropriate.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

CECO CLARIFICATION

The HEDAT has reevaluated this HED and finds that the Final Summary Report submitted to the NRC was in error in regards to the implementation date. An implementation of "Accept As Is" was inadvertently submitted, it should have read "First Refueling Outage". This has been corrected in our records and data base, and the corrective action has been scheduled into first outage activities.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
1ST REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 163
HED CATEGORY 3C
FSR PAGE 239

FINDING

Pointer tips on the scales of meters and recorders cover the scale graduations. The ability to see the graduations of the affected parameter is critical when reading meters. (Photo Log No. B-17, H-6, H-7)

RESPONSE

Recorders have scale paper with matching scales on them. Calibration is keyed off the recorder scale paper not the recorder scale. All control room meters are readable. Pointer tips are designed so scale graduations can be seen.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

CECO CLARIFICATION

The HEDAT reevaluated the recorders documented in this HED. The problem is most acute with the "Bailey" brand of recorder. These recorders will be replaced with state-of-the-art digital recorders. Since many of these recorders are used on the P4137 panel for which a redesign commitment has been made and others are associated with class 1E parameters, the replacement process will not be complete until the end of the second outage. Other recorders affected by this problem will be modified on a case-by-case basis. In most instances it will entail a customized fix by our Instrument Maintenance department. A good faith effort will be made to address these other recorders by 12-31-88.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
12/31/88

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 160
HED CATEGORY 2C
FSR PAGE 247

FINDING

There is difficulty in reading the legends on legend lights under ambient lighting conditions when the legend light is not lit. This is primarily true of the red, green and dark blue lights. (Photo Log No. B-21)

RESPONSE

There are numerous indications to legends on legend lights available to the operator. These include color coding, position coding, and component labeling. The operators report no problems in identifying the meaning of legend lights.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

In addition, The justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. Apparently related HEDs are numbers 192, 355, 509, 510, 511, 216, 215, 283, 217, 218, 219, 220, 221, 222, and 293.

CECO CLARIFICATION

One of the objectives of the multidisciplined HEDAT and particularly the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HEDs identified in the TER as related to this HED. These HEDs are concerned with the apparent lack of legend light discriminability either because of differences in lens cap color, light intensity and contrast ratios, or non adherence to engraving specifications documented in the CECO Human Factors checklist. In all individual instances the deviations from the criteria were small and of no import. Upon reevaluation the HEDAT feels this

remains the case except for the "blue" indicator light lens caps. For these there is little consistency across the control room. Therefore, an effort will be made to obtain lens caps that meet CECo Human Factors Engineering contrast ratio criteria. These will be engraved in accordance with CECo engraving guidelines and installed in the control room by 12-31-88.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
12/31/88

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCDR.

HED # 456
HED CATEGORY 3C
FSR PAGE 259

FINDING

During the task analysis and verification, a number of indicator lights were identified that should contain wording to indicate the status of the energized lights related equipment, but which currently contain no legend. (Photo Log No. H-9)

RESPONSE

The addition of wording on the cited lights is unnecessary due to the redundant coding in place for indicator lights. The indicator lights are color coded as well as position coded for operator use.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

CECO CLARIFICATION

Reevaluation by the HEDAT resulted in concurrence with the NRC's comments. The indicator lights cited in the original HED will be appropriately engraved in accordance with the Station's Human Engineering labeling standard. A good faith effort will be made to complete this corrective action by the end of the first refueling outage.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
1ST REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 533
HED CATEGORY 2C
FSR PAGE 267

FINDING

Color selection for dual-pen recorders is inconsistent. Although red and blue have been selected for pen colors, there is no consistent selection of color for the upper and lower pens. Potential problems exist in parameter identification and chart maintenance (inking). (Photo Log No. B-25.1)

RESPONSE

Labels for dual-pen recorders list pen colors in the order listed on the chart paper. The operators report no difficulty in determining recorder parameters.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

CECO CLARIFICATION

Reevaluation of this HED by the HEDAT has resulted in concurrence with the NRC's comments. Therefore, all control room recorders will be modified such that all pen number 1s have the same color, all pen number 2s have the same color, etc. Actual pen color selection will be made after a review of the control room's current pen color usage so as to minimize disruption to operations. Recorder labels will be reengraved as appropriate.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
1ST REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 119
HED CATEGORY 2C
FSR PAGE 268

FINDING

The "control rod drive temperatures" is a multi-point recorder with a manufacturer's channel capacity of 24 points. The channel capacity has been expanded to record 185 points via additional electronic equipment. Operators are required to convert bank-point numbers to rod numbers via a temporary conversion table. The guidelines recommend not expanding a multi-point recorder beyond its capability.

RESPONSE

This recorder is only used to monitor control rods with temperature problems. Such rod indication will deviate beyond the average parameter. Any point out of tolerance is easily detected.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

CECO CLARIFICATION

Reevaluation by the HEDAT has produced concurrence with the NRC's comments on this HED. Therefore the discrepant recorder will be replaced with a state-of-the-art electronic recorder that meets Human Engineering design standards.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 305
HED CATEGORY 3C
FSR PAGE 319

FINDING

The mimic colors on the following panels are not discriminantly different from each other; H13-P601 (brown, black and blue); PM03J (orange and red); PM02J (orange, red and yellow); PM01J (black and blue); PM16J (black and blue); PM06J (two shades of green). (Photo Log No. H-17, H-18, H-19, H-20)

RESPONSE

The use of color for discriminating mimics is not critical for the operation of this panel. Mimics are redundantly coded by use of beginning and ending points and labeling as well as color.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

In addition, The justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. Apparently related HEDs are numbers 504, 178, and 306.

CECO CLARIFICATION

One of the objectives of the multidisciplined HEDAT and particularly the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HEDs identified in the TER as related to this HED. These HEDs are concerned with the apparent lack of consistency in the use of colors on the mimics as well as the apparent lack of sufficient contrast between the colors used. Mimics are used on the cited panels as an operator aid. The HEDAT therefore feels that appropriate and consistent use of color on them is important. Consequently, mimics will be evaluated by a Human Factors

Engineering specialist and an Operations representative to ensure their accuracy and to develop a consistent mimic color standard for use at the station that will be in consonance with the station's color useage standard. Mimic size and use of symbols will also be standardized. This will be accomplished in concert and coordination with the background shading and lines of demarcation programs.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 343
HED CATEGORY 2C
FSR PAGE 325

FINDING

The off gas system holdup drain line valves are shown in series on the control board mimics, but are actually separate lines above where the pipe connects to common headers (on N62-P601). The mimic should be corrected to conform to system structure.

RESPONSE

The mimic correctly reflects the flexibility of the system in that either off gas condenser can be used for either train.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

CECO CLARIFICATION

Reevaluation of this HED by the HEDAT resulted in concurrence with the NRC's comments. Therefore, the off gas mimic will be modified appropriately in concert and coordination with the station's background shading and lines of demarcation programs.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 414
HED CATEGORY 2B
FSR PAGE 328

FINDING

Some of the items in the right-hand column of P-1 (where numbers are used to designate special items or routines) are difficult to understand or interpret. Better identification of parameters monitored would enhance operations.

RESPONSE

The cited acronyms are referenced in the procedure [LOP-CX-(series)], which is available to the operators.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

CECO CLARIFICATION

P-1 is a computer program accessible to the operator that runs the OD-17 computer routine that presents core thermal data. The numbers referred to in the HED are code numbers whose meanings are available to the operator via the procedure for the program located at the unit. This information is supplemental to that presented on the screen. Operators receive training in the use of the computer and in the interpretation of the data presented by this program. As an operator aid, the program is acceptable as is.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 415
HED CATEGORY 2B
FSR PAGE 329

FINDING

Thermal abbreviations are difficult to understand or interpret. They should all be verified to correspond with technical specification abbreviations. A list of standard names, acronyms, abbreviations, part/system numbers should be used.

RESPONSE

The acronyms and abbreviations are referenced in the procedure, which is available to the operators.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

CECO CLARIFICATION

Nuclear thermal dynamics is a complex topic. It is an integral aspect of plant operations and as such operators are trained and tested in it. Core thermal dynamic data is available to the operator via the computer (Program P-1, routine OD-17). Because of the complexity of the data and the limited display space available on the control room computer system (CRTs and Printers), the use of Thermal acronyms and abbreviations is necessary. Through training and the RO licensing process operators become familiar with the meaning and interpretation of the acronyms and abbreviations associated with thermal dynamics. In addition, they are defined and explained in the computer procedure available at each unit. As such, they are standardized as the HED suggests and no further action is warranted.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 124
HED CATEGORY 2C
FSR PAGE 330

FINDING

The computer system does not provide prompting and structuring features which allow the operator to request additional information.

RESPONSE

The computer system is not interactive so that these features would not really fit in with the overall structure of the system. Documentation containing additional information is provided at the computer workstation.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

CECO CLARIFICATION

The process computer system available to the operator in the control room was designed as an operational aid to provide operators with desirable information in a readily useable fixed format under normal and transient conditions. In either of those conditions, an operator would be expected to be using the information available to him/her to take action on the control panels and to monitor the actions' effectiveness. An interactive computer system with menus, prompts, program stops for data input, and data structuring features would not be conducive to the function for which the machine was intended. Additional and supplemental information is readily available to the operator from other sources.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCDR.

HED # 125
HED CATEGORY 2C
FSR PAGE 331

FINDING

The computer system does not contain prompting and structuring features which allow the operator to request corrected information when an error is detected.

RESPONSE

The system is not interactive so that these features would not fit in with the overall structure of the system. Error messages are displayed when an error is made and documentation for these messages and the responses are provided at the computer workstation.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

CECO CLARIFICATION

The process computer system available to the operator in the control room was designed as an operational aid to provide operators with desirable information in a readily useable fixed format under normal and transient conditions. In either of those conditions, an operator would be expected to be using the information available to him/her to take action on the control panels and to monitor the actions' effectiveness. An interactive computer system with menus, prompts, program stops for data input, and data structuring features would not be conducive to the function for which the machine was intended. Additional and supplemental information is readily available to the operator from other sources.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 128
HED CATEGORY 2C
FSR PAGE 352

FINDING

The color red is used to highlight points that are alarming on CRT displays and for closed, open, or on, for other CRT displays. Highlighting methods used for emergency conditions should not be used in association with normal conditions.

RESPONSE

The indicated uses of the color red on CRTs is consistent with that used elsewhere in the control room. The use of red for an alarming point is also consistent across all CRT displays which contain points.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

In addition, the justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. Apparently related HEDs are numbers 237, 240, 309, 308, 130 and 131 as listed in section A3 on page 29 of the TER.

CECO CLARIFICATION

The following response addresses seven HEDs the NRC felt to be related (see the NRC/SAIC Comment above). Four of the HEDs deal with CRT hardware issues while three deal with color graphic software issues, i.e., consistent use of color. One of the objectives of the multidisciplinary HEDAT and particularly the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HEDs

identified in the TER as related to this HED. These HEDs are concerned with the readability/comprehensibility and use of color of the control room computer CRT displays. The following comments relate to the HEDAT's reevaluation of the CRT hardware issues while the final paragraph is concerned with the use of color issues. Though the CRTs in use at LaSalle are of graphic quality, they do not contain the amount of picture elements per square inch suggested by the CEC Co guidelines and NUREG 0700 for the display of Complex shapes. The HEDAT maintains that "Complex" shapes are not presented on the control room CRTs and hence there is no need to, "distinguish between them". Consequently, the current CRTs are adequate.

Concerning the issue of use of color, LaSalle station adheres to a green board color coding convention in which the color "green" denotes a "Normal" condition and the color "red" denotes an "Abnormal" condition when the unit is above 30% power. The CEC Co computer display conventions currently do not use green board coding, which in part accounts for the cited discrepancies. The feasibility of using green board coding for the computer graphics is being explored at CEC Co's Byron PWR station. Several displays have been modified and their use is being evaluated. One problem is that green board coding does not provide for indication of equipment status beyond normal/abnormal, for example, open/closed, on/off, etc. Resolutions to this problem are being evaluated at the two stations. When the "green board convention" computer graphics problems have been successfully resolved at Byron, that convention will be implemented at LaSalle if feasible. Resolution and implementation is anticipated prior to the completion of the second refueling outage.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 130
HED CATEGORY 2C
FSR PAGE 353

FINDING

The color green is used in CRT displays to indicate an open breaker, a normal condition, a closed valve or an "off" condition. According to criteria, the color green should be used to indicate a safe condition, no operator action required or that a parameter valve is within tolerance.

RESPONSE

The CRTs in the control room are considered job performance aids and are made available for diagnostic purposes. The use of graphics, shapes, alphanumeric and colors are provided to improve the operators' understanding of plant status. These coding techniques are used consistently. While at the boards, the operators implement their decisions where all coding (labels, color, etc.) is consistently used and understood by the operators. Additionally, the operators are trained to make decisions and take action based on control board status.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

In addition, the justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. Apparently related HEDs are numbers 237, 240, 309, 308, 128 and 131.

CECO CLARIFICATION

The following response addresses seven HEDs the NRC felt to be related (see the NRC/SAIC Comment above). Four of the HEDs deal with CRT hardware issues while three deal with color graphic software issues, i.e., consistent use of color. One of the objectives of the multidisciplined HEDAT and particularly

the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HEDs identified in the TER as related to this HED. These HEDs are concerned with the readability/comprehensibility and use of color of the control room computer CRT displays. The following comments relate to the HEDAT's reevaluation of the CRT hardware issues while the final paragraph is concerned with the use of color issues. Though the CRTs in use at LaSalle are of graphic quality, they do not contain the amount of picture elements per square inch suggested by the CECo guidelines and NUREG 0700 for the display of Complex shapes. The HEDAT maintains that "Complex" shapes are not presented on the control room CRTs and hence there is no need to, "distinguish between them".

Concerning the issue of use of color, LaSalle station adheres to a green board color coding convention in which the color "green" denotes a "Normal" condition and the color "red" denotes an "Abnormal" condition when the unit is above 30% power. The CECo computer display conventions currently do not use green board coding, which in part accounts for the cited discrepancies. The feasibility of using green board coding for the computer graphics is being explored at CECo's Byron PWR station. Several displays have been modified and their use is being evaluated. One problem is that green board coding does not provide for indication of equipment status beyond normal/abnormal, for example, open/closed, on/off, etc. Resolutions to this problem are being evaluated at the two stations. When the "green board convention" computer graphics problems have been successfully resolved at Byron, that convention will be implemented at LaSalle if feasible. Resolution and implementation is anticipated prior to the completion of the second refueling outage.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 426
HED CATEGORY 2B
FSR PAGE 360

FINDING

The alarm typer should not print position changes because this clutters the printout and makes it difficult to zero in on a specific alarm of interest. The current system creates a nuisance printout and clutters typer with irrelevant information.

RESPONSE

Information from the alarm types is used for the diagnostic review which occurs after an event.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

CECO CLARIFICATION

The alarm typer is present in the control room as an operational aid to the operator. Its intended function is to serve as an archival data record of actuated sensors to allow for diagnostic review subsequent to an event. As such, any change in sensor condition that potentially triggers an alarm will be recorded. Auditory signalling, however, is reserved for instances in which significant sensor actuation activity occurs. Nonetheless, the alarm typer printout can appear cluttered, particularly after a Reactor SCRAM situation. It is felt that the potential operational benefit of knowing which sensor caused an alarm outweighs the "nuisance" characteristic of having all alarming sensors printed.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 93
HED CATEGORY 1C
FSR PAGE 376

FINDING

The "Reboiler Leak Detection Monitor 1D18-K752" is located in the middle of five control room Heating Ventilation Air Conditioning (HVAC) Monitors on (OPM14J). (Photo Log No. D-10)

RESPONSE

This display is adequately labeled and easily identified as a unique instrument. The operators are clearly aware it is not related to the HVAC monitors.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

CECO CLARIFICATION

The "Reboiler Leak Detection Monitor" is a radiation monitor located with similar monitors on a common panel, OPM14J. It is uniquely labeled so that it is readily identifiable. Nonetheless, the monitor will be moved two monitor spaces to the left so that the HVAC monitors can all be grouped together.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 361
HED CATEGORY 1C
FSR PAGE 379

FINDING

The residual heat removal blowdown valves are not grouped appropriately. They should be grouped together to avoid operator confusion and error. (Photo Log No. G-8)

RESPONSE

These valves are containment isolation valves and are divisionally separated. The grouping, with other isolation valves is appropriate.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

CECO CLARIFICATION

To reiterate our original response to this HED, the cited valves (the RHR Blowdown Isolation Valves) are containment isolation valves, are safety related, and are divisionally separated. They are divisionally integrated with the other containment isolation valves. The purpose of this panel arrangement is to group all safety related containment isolation valves together so that in a transient condition requiring a containment isolation, the operator can quickly confirm that the required isolation has occurred by glancing at the position indication for this cluster of valves.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 367
HED CATEGORY 1C
FSR PAGE 381

FINDING

The operator survey determined that the residual heat removal/reactor core isolation cooling valves are spread out on H13-P601. (Photo Log No. G-9)

RESPONSE

These valves are adequately labeled and sufficient mimicking is available to aid the operators in recognizing functional groupings.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

CECO CLARIFICATION

The Residual Heat Removal/Reactor Core isolation cooling valves are separated on the H13-P601 panel due in part to divisional separation criteria. They are functionally grouped with related displays, appropriately labeled, and effectively incorporated within an ECCS mimic. No problems were discerned with these controls during either the Review's task analysis or validation of control room function. The HEDAT feels these controls are appropriately placed.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 482
HED CATEGORY 2C
FSR PAGE 383

FINDING

During the task analysis and verification, it was noted that the indicator lights above the control switches on the PM06J panel are spaced so far apart that lights for adjacent controls appear to be related. (Photo Log No. F-9)

RESPONSE

The control room operators are aware of the relationship between the indicator lights and their respective controls. These lights are redundant indications of status, and the operators report no degradation in performance due to their arrangement.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

CECO CLARIFICATION

Reevaluation of this problem by the HEDAT resulted in concurrence with the NRC's comments. To emphasize the relationship of controls-to-lights, sub system size lines of demarcation will be drawn between nonrelated lights vertically, and horizontally between the two rows of separate controls.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 252
HED CATEGORY 2A
FSR PAGE 389

FINDING

During validation, operators were observed to pause frequently in the performance of job duties on the heater drain system to verify their actions. The addition of mimics would facilitate operations. (Photo Log No. D-18)

RESPONSE

The heater drain system is not a safety system. It functions automatically during accident situations and does not require the operator's immediate attention.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

CECO CLARIFICATION

The HEDAT reevaluated this problem in light of the NRC's comments and feels the original evaluation and response was appropriate. The Heater Drain system is not safety related nor is its operation time critical. It is only used during startups and shutdowns. In transient situations the system functions automatically and does not require the operator's immediate attention. Finally, the original finding cites the operators for pausing in the performance of job duties which by procedure and training they are supposed to do in order to verify the actions they have taken. Therefore the HEDAT feels no "corrective" action is necessary.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 58
HED CATEGORY 1C
FSR PAGE 392

FINDING

The manual, outboard, and inward isolation emergency controls are located on H13-P601. These controls are difficult to identify and should be accentuated. (Photo Log No. D-22)

RESPONSE

The cited controls are color coded red and shape coded differently than the other controls. This is adequate accentuation.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

CECO CLARIFICATION

The HEDAT has reevaluated this HED and concludes that the cited controls are readily identifiable. They are the only round push-button type controls within the demarcated area of this section of the H13-P601 panel. They are red in color (because of their "Emergency" function). The other controls on this section of the panel are black pistol-grip type controls. As stated in the original response, their unique shape and color is adequate accentuation. No additional accentuation is required.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 543
HED CATEGORY 1C
FSR PAGE 395

FINDING

The reactor coolant level indicator is located with the residual heat removal B group of meters (on H13-P601) but is not controlled by that system only. (Photo Log No. F-10)

RESPONSE

Operators report no problems with the location of the reactor coolant level indicator. Its arrangement on H13-P601 is appropriate since it is also used when the operators are working with the high pressure core spray (HPCS) system.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

CECO CLARIFICATION

The Reactor Level Fuel Zone indicator cited in the HED displays reactor levels from -311 inches to -111 inches in the vessel, the area around the active fuel. The DCRDR Task Analysis identified this indication as required. It also determined that all features relevant to the current indication were acceptable, ie., scale, units, range, and location. Therefore, no further action is required.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCDR.

HED # 473
HED CATEGORY 1C
FSR PAGE 396

FINDING

During the task analysis and verification, it was observed that the reactor pressure and the reactor wide range level indicators, though functionally related, are not grouped together on the H13-P603 panel. (Photo Log No. I-25)

RESPONSE

These indicators are used during feedwater operation. Therefore their location is appropriate.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

CECO CLARIFICATION

While it is true that reactor level and pressure are functionally related, the wide range level indication is located closer to the feedwater control station and away from the pressure indication because reactor level is directly controlled by the feedwater system and feedback as to reactor level is necessary when manipulating the feedwater controls. Moreover, when reactor level is below 0 inches with feedwater available this is the only indicator available to tell the operator if reactor level is increasing. Its present location and arrangement is therefore appropriate and no corrective action is warranted.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 532
HED CATEGORY 2C
FSR PAGE 401

FINDING

Annunciator panel designations for panel H13-P601 proceed from A to D, then F, then E. (Photo Log No. F-14)

RESPONSE

The operators do not use the letters above each annunciator panel as a designator. The annunciators are referenced by the control panel where they are located. In addition, all annunciator procedure books are located in front of respective panels so search time to locate procedures is not required.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

CECO CLARIFICATION

While it is true that the annunciator box letters proceed A to D, F and then E on the H13-P601 panel, it is of no consequence because the letters have no sequential meaning and are only used as partial identifiers. Each annunciator tile is uniquely identified via the panel number, eg. 1H13-P601, the letter designate of the annunciator window box, eg. A, and the grid X and Y coordinates the tile occupies, eg. 1 04. The tiles are thus referenced in all procedures, training manuals, maintenance work requests, shift logs, etc. Since the letters are only used as designators with no order or other significance implied the HEDAT feels no "corrective" action is warranted.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 550
HED CATEGORY 2C
FSR PAGE 403

FINDING

The main stop valve is located in a string of other valves: IV-1, MSV-2, IV-2, IV-3, on PM02J. (Photo Log No. F-22)

RESPONSE

The main stop valve (MSV-2) is used only during chest warming of the turbine during startup. It is not used in emergency situations and the operators report no difficulty in its location.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

CECO CLARIFICATION

The indication cited in the HED is the Main Stop Valve's servo valve's current draw in amps. It is located with other Turbine servo valve current indicators in a vendor panel on the PM02J panel. It is directly above indication for the stop valve's position, and above the control for the valve. The valve is physically located downstream of the Main Steam Isolation Valves at the turbine and is used during startups to preheat and expand the turbine shell in order to prevent turbine damage. The HEDAT has reevaluated this HED and determined that the indication is appropriately located given its function and significance.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 530
HED CATEGORY 2C
FSR PAGE 435

FINDING

Source range monitor (SRM) bypass controls and indicators (H13-P601) are not consistent. The indicators are laid out A, B, C, D while the control detents are laid out in a clockwise order of A, C, B, D. (Photo Log No. F-13)

RESPONSE

The SRM bypass control is not a time-critical instrument and not important for post-accident monitoring. The operators do not report any difficulty in operation due to the current layout.

NRC/SAIC COMMENT

The basis for the justification for not addressing this HED is not adequate for one or more of the following reasons:

1. It does not address operational or behavioral factors or issues.
2. It does not sufficiently address the discrepancy.
3. It cites absence of previous operator error.
4. It cites utility, industry, or manufacturer's standard.

CECO CLARIFICATION

A reevaluation of this HED by the HEDAT resulted in concurrence with the NRC's comments. Therefore, the SRM Bypass Control will be revised so that the monitors are "bypassed" in a clockwise order of "A, B, C and D". Since the negative transfer of training for this modification will be strong because this the current layout is a PWR industry standard, an implementation of the second refueling outage is achievable.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

Commonwealth Edison Company's Revised Response/Clarification
to HEDs Referred to in the NRC's Safety Evaluation (SE) Report
of the LaSalle County Station DCRDR

Safety Evaluation Report - Enclosure B (TER)
Revised Responses
(TER Append. A3)

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCDR.

HED # 429
HED CATEGORY 2C
FSR PAGE 100

FINDING

A different radio channel is needed for operations so that other departmental activities do not interfere with operations activities. Radio communication should consider the extent to which radio interference could adversely affect control room operations.

RESPONSE

Radios are used primarily by personnel associated with operations to insure operations is kept informed of plant activities. A third radio channel will be added to be used for pagers. This will reduce the traffic on the existing channels.

NRC/SAIC COMMENT

The justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. Apparently related HEDs are numbers 428, 538, 561, 562, 563, and 24.

CECO CLARIFICATION

One of the objectives of the multidisciplined HEDAT and particularly the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HEDs identified in the TER as related to this HED. The HEDs cited all concerned aspects of the plant's communication system. That system is composed of four parts; one is the VHF radio, another is the Sound Powered Phone network, a third is the pager, and the fourth is the regular phone system. Operators have access to all four systems but rarely use the sound powered phones; these are generally reserved for use by the instrument maintenance department for instrument calibrations where immediate and frequent communication is important. Sound powered headsets and patch cords are available to the operator at the center desk. The operators primary means

of communication with the plant is the VHF radio system. A problem was identified and documented during the DCRDR with the availability of sufficient radio channels for operations use. In response, a third channel has been added. In place procedures govern radio channel use.

IMPLEMENTATION
2ND REFUELING OUTAGE

REVISED IMPLEMENTATION
COMPLETED

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 428
HED CATEGORY 2C
FSR PAGE 101

FINDING

The radio pager is on the control room channel. There should be no radio pagers on the control room operating frequency since this interferes with operations. Pager can interrupt a critical operating information channel and delay operator in responding to an emergency.

RESPONSE

A third radio channel will be used for pagers. This will reduce the traffic on the existing channels.

NRC/SAIC COMMENT

The justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. Apparently related HEDs are numbers 429, 538, 561, 562, 563, and 24.

CECO CLARIFICATION

One of the objectives of the multidisciplined HEDAT and particularly the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HEDs identified in the TER as related to this HED. The HEDs cited all concerned aspects of the plant's communication system. That system is composed of four parts; one is the VHF radio, another is the Sound Powered Phone network, a third is the pager, and the fourth is the regular phone system. Operators have access to all four systems but rarely use the sound powered phones; these are generally reserved for use by the instrument maintenance department for instrument calibration where immediate and frequent communication is important. Sound powered headsets and patch cords are available to the operator at the control desk. The operators primary means of communication with the plant is the VHF radio system. A problem was identified and documented during the DCRDR with the availability of sufficient radio channels for operations use. In response, a third channel has been added in order to reserve at least two channels for operations use.

Other channels are available but are generally used by other groups or departments, eg., security. In place procedures govern radio channel use. The other communication systems are readily available to the operators. Both regular and page phones are located at primary control panel workstations and at the unit and center desk. Page messages are heard over loudspeakers. These are appropriately placed in the control room to cover the main control panels and center desk.

IMPLEMENTATION
2ND REFUELING OUTAGE

REVISED IMPLEMENTATION
COMPLETED

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 538
HED CATEGORY 2C
FSR PAGE 110

FINDING

Patch cords and at least one sound-powered phone are not stored at each patch panel location.

RESPONSE

Control room operators do not routinely use sound-powered telephones. Therefore, the lack of these phones does not affect control room operations.

NRC/SAIC COMMENT

The justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. Apparently related HEDs are numbers 429, 428, 561, 562, 563, and 24.

TECO CLARIFICATION

One of the objectives of the multidisciplined HEDAT and particularly the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HEDs identified in the TER as related to this HED. The HEDs cited all concerned aspects of the plant's communication system. That system is composed of four parts; one is the VHF radio, another is the Sound Powered Phone network, a third is the pager, and the fourth is the regular phone system. Operators have access to all four systems but rarely use the sound powered phones; these are generally reserved for use by the instrument maintenance department for instrument calibrations where immediate and frequent communication is important. Sound powered headsets and patch cords are available to the operator at the center desk. The operators primary means

of communication with the plant is the VHF radio system. A problem was identified and documented during the DCRDR with respect to the availability of patch cords and at least one sound powered phone at each patch panel location. Since the sound powered phone system is rarely used by the operators, the availability of this equipment at the center desk is sufficient.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCDR.

HED # 561
HED CATEGORY 2C
FSR PAGE 111

FINDING

A well marked accessible location for the sound powered phones is not provided in the control room.

RESPONSE

Control room operators do not routinely use sound-powered telephones.

NRC/SAIC COMMENT

The justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. Apparently related HEDs are numbers 429, 428, 538, 562, 563, and 24.

CECO CLARIFICATION

One of the objectives of the multidisciplined HEDAT and particularly the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HEDs identified in the TER as related to this HED. The HEDs cited all concerned aspects of the plant's communication system. That system is composed of four parts; one is the VHF radio, another is the sound powered phone network, a third is the pager, and the fourth is the regular phone system. Operators have access to all four systems but rarely use the sound powered phones; these are generally reserved for use by the instrument maintenance department for instrument calibrations where immediate and frequent communication is important. Sound powered headsets and patch cords are available to the operator at the center desk. The operators primary means

of communication with the plant is the VHF radio system. A problem was identified and documented during the DCRDR with respect to marking of the location of the sound powered phones. Since the sound powered phone system is rarely used by the operators, the equipment is available at the center desk. All operators are trained as to the location of this equipment should they ever find a need to use it.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 562
HED CATEGORY 2C
FSR PAGE 112

FINDING

Sound powered phones do not have the capability of switching directly into the paging system.

RESPONSE

Control room operators do not routinely use sound-powered telephones.

NRC/SAIC COMMENT

The justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. Apparently related HEDs are numbers 429, 428, 538, 561, 563, and 24.

CECO CLARIFICATION

One of the objectives of the multidisciplined HEDAT and particularly the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HEDs identified in the TER as related to this HED. The HEDs cited all concerned aspects of the plant's communication system. That system is composed of four parts; one is the VHF radio, another is the sound powered phone network, a third is the pager, and the fourth is the regular phone system. Operators have access to all four systems but rarely use the sound powered phones; These are generally reserved for use by the instrument maintenance department for instrument calibrations where immediate and frequent communication is important. Sound powered headsets and patch cords are available to the operator at the center desk. The operators primary means

of communication with the plant is the VHF radio system. A problem was identified and documented during the DCRDR with respect to the lack of ability of the Sound Powered Phones to switch directly into the paging system. Since the Sound Powered Phone System is rarely used by the operators that feature is not required nor is it desireable.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 563
HED CATEGORY 2C
FSR PAGE 113

FINDING

Jacks for the sound powered phone system are not provided at every work station so the long cords may be required which could result in a tripping hazard.

RESPONSE

Control room operators do not routinely use sound-powered telephones.

NRC/SAIC COMMENT

The justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. Apparently related HEDs are numbers 429, 428, 538, 561, 562, and 24.

CECO CLARIFICATION

One of the objectives of the multidisciplined HEDAT and particularly the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HEDs identified in the TER as related to this HED. The HEDs cited all concerned aspects of the plant's communication system. That system is composed of four parts; one is the VHF radio, another is the Sound Powered Phone network, a third is the pager, and the fourth is the regular phone system. Operators have access to all four systems but rarely use the sound powered phones; these are generally reserved for use by the instrument maintenance department for instrument calibrations where immediate and frequent communication is important. Sound powered headsets and patch cords are available to the operator at the center desk. The operators primary means

of communication with the plant is the VHF radio system. A problem was identified and documented during the DCRDR with respect to the lack of Sound Powered Phone jacks at all work stations. Since the sound Powered Phone System is rarely used by the operators this is not a problem.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 24
HED CATEGORY 2C
FSR PAGE 114

FINDING

The location of loudspeakers in the control room does not provide adequate coverage to all areas in the control room.

RESPONSE

The "dead spot" areas are located on back panels. All main control room locations are audible to the operators. The unit operator is relieved prior to going to the back panel area.

NRC/SAIC COMMENT

The justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. Apparently related HEDs are numbers 429, 428, 538, 561, 562, and 563.

CECO CLARIFICATION

One of the objectives of the multidisciplined HEDAT and particularly the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HEDs identified in the TER as related to this HED. The HEDs cited all concerned aspects of the plant's communication system. That system is composed of four parts; one is the VHF radio, another is the Sound Powered Phone network, a third is the pager, and the fourth is the regular phone system. Operators have access to all four systems but rarely use the sound powered phones; these are generally reserved for use by the instrument maintenance department for instrument calibrations where immediate and frequent communication is important. Sound powered headsets and patch cords are available to the operator at the center desk. The operators primary means of communication with the plant is the VHF radio system. A problem was identified and documented during the DCRDR with the availability of sufficient radio channels for operations use. In response, a third channel will be added in order to reserve at least two channels for operations use. Other channels are available but are generally used by other groups or departments, eg., security. In place procedures govern radio channel use.

The other communication systems are readily available to the operators. Both regular and page phones are located at primary control panel workstations and at the unit and center desk. Page messages are heard over loudspeakers. These are appropriately placed in the control room to cover the main control panels and center desk. Backpanel areas do contain "dead spot" locations. A loudspeaker will be placed in this region to cover this area.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 289
HED CATEGORY 2B
FSR PAGE 207

FINDING

The "drywell air suppression chamber and suppression pool water integrity: CM037" (on PM13J) recorder has two scales measuring temperatures ranging from 0-250 degrees. The top scale measures drywell and suppression chamber air temperatures (3 pts) in increments of 1.75 degrees. The bottom scale measures suppression pool water temperatures (14 pts) in increments of 10. It is necessary to compare the two scales and because of the increment difference, it is difficult. (Photo Log No. B-9)

RESPONSE

The drywell air temperature parameters will be removed from this recorder and relocated to a new recorder and labeled with consistent graduations.

NRC/SAIC COMMENT

The justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. An apparently related HED is number 112.

CECO CLARIFICATION

One of the objectives of the multidisciplined HEDAT and particularly the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HED identified in the TER as related to this HED. This resulted in concurrence with the NRC's comment. Therefore, the drywell air and suppression pool water temperature recorder will be replaced with one more appropriate to the displays' function. This will be done in conjunction with the redesign of the PM13J panel committed to as the response to HEDs 286, 476, 478, 371, 372, 197, and 362.

IMPLEMENTATION
1ST REFUELING OUTAGE

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO,
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCDR.

HED # 112
HED CATEGORY 2C
FSR PAGE 210

FINDING

The drywell air suppression chamber and suppression pool water recorders contain information for seventeen points. An operator is required to make at least two conversions before making an assessment regarding any particular point. (Photo Log No. B-10)

RESPONSE

A job performance aid which identifies each point will be permanently engraved and placed on the recorder door so as not to obscure the recorded trend.

NRC/SAIC COMMENT

The justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. An apparently related HED is number 289.

CECO CLARIFICATION

One of the objectives of the multidisciplinary HEDAT and particularly the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HED identified in the TER as related to this HED. This resulted in concurrence with the NRC's comment. Therefore, the drywell air and suppression pool water temperature recorder will be replaced with one more appropriate to the displays' function. This will be done in conjunction with the redesign of the PM13J panel committed to as the response to HEDs 286, 476, 478, 371, 372, 197, and 362.

IMPLEMENTATION
1ST REFUELING OUTAGE

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 192 & 355
HED CATEGORY 2C
FSR PAGE 245

FINDING

The color of blue legend lights is not clearly identifiable. On Unit One, blue lights look green while unlit, and look white when lit. On Unit Two, blue lights look blue when unlit but look violet when lit. (Photo Log No. B-20, H-9)

RESPONSE

The control room operators are aware of the slight color differences in blue legend lights. They report no difficulty in discriminating the color of legend lights.

NRC/SAIC COMMENT

The justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. Apparently related HEDs are numbers 355, 509, 510, 511, 160, 216, 215, 283, 217, 218, 219, 220, 221, 222, and 293.

CECO CLARIFICATION

One of the objectives of the multidisciplined HEDAT and particularly the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HEDs identified in the TER as related to this HED. These HEDs are concerned with the apparent lack of legend light discriminability either because of differences in lens cap color, light intensity and contrast ratios, or non adherence to engraving specifications documented in the CECO Human Factors checklist. In all individual instances the deviations from the criteria were small and of no import. Upon reevaluation the HEDAT feels this remains the case except for the "blue" indicator light lens caps. For these there is little consistency across the control room. Therefore, an effort will be made to obtain lens caps that meet CECO Human Factors Engineering contrast ratio criteria. These will be engraved in accordance with CECO engraving guidelines and installed in the control room by 12-31-88.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
12/31/88

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 509, 510 & 511
HED CATEGORY 2C
FSR PAGE 246

FINDING

Light intensity of some indicating lights and legend pushbuttons (as compared to the surrounding panel) is less than the recommended 10%.

RESPONSE

The light of all indicating lights and pushbuttons is discriminable from the surrounding panel due to the bright light contrasting to the painted panel.

NRC/SAIC COMMENT

The justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. Apparently related HEDs are numbers 192, 355, 510, 511, 160, 216, 215, 283, 217, 218, 219, 220, 221, 222, and 293.

CECO CLARIFICATION

One of the objectives of the multidisciplined HEDAT and particularly the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HEDs identified in the TER as related to this HED. These HEDs are concerned with the apparent lack of legend light discriminability either because of differences in lens cap color, light intensity and contrast ratios, or non adherence to engraving specifications documented in the CECO Human Factors checklist. In all individual instances the deviations from the criteria were small and of no import. Upon reevaluation the HEDAT maintains that aside from the documented problem concerning the consistency and readability of the "blue" legend light indicators, the cumulative as well as individual impact of the other cited deviations is negligible. Therefore, new "blue" indicator light lens caps will be obtained and installed that meet the checklist criteria.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
12/31/88

HED # 160
HED CATEGORY 2C
FSR-PAGE 247

Referenced on Page: TER Append. A2-12, A2-13

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 216
HED CATEGORY 3C
FSR PAGE 249

FINDING

The character font styles on legend lights are not consistent throughout the control room.

RESPONSE

Character font styles on legend lights vary slightly, depending on the vendor supplier. The legend lights are readable and the different font styles do not adversely affect operator performance.

NRC/SAIC COMMENT

The justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. Apparently related HEDs are numbers 192, 355, 509, 510, 511, 160, 215, 283, 217, 218, 219, 220, 221, 222, and 293.

CECO CLARIFICATION

One of the objectives of the multidisciplined HEDAT and particularly the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HEDs identified in the TER as related to this HED. These HEDs are concerned with the apparent lack of legend light discriminability either because of differences in lens cap color, light intensity and contrast ratios, or non adherence to engraving specifications documented in the CECO Human Factors checklist. In all individual instances the deviations from the criteria were small and of no import. Upon reevaluation the HEDAT maintains that aside from the documented problem concerning the consistency and readability of the "blue" legend light indicators, the cumulative as well as individual impact of the other cited deviations is negligible. Therefore, new "blue" indicator light lens caps will be obtained and installed that meet the checklist criteria. No other lens caps will be changed and no "corrective action" will be taken on this non-problematic deviation.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 215 & 283
HED CATEGORY 3C
FSR PAGE 250

FINDING

Character heights on legend lights do not subtend a visual angle of 15 minutes.

RESPONSE

Legend lights are read in the lit condition. The backlighting of the legends aids in readability.

NRC/SAIC COMMENT

The justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. Apparently related HEDs are numbers 192, 355, 509, 510, 511, 160, 216, 283, 217, 218, 219, 220, 221, 222, and 293.

CECO CLARIFICATION

One of the objectives of the multidisciplined HEDAT and particularly the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HEDs identified in the TER as related to this HED. These HEDs are concerned with the apparent lack of legend light discriminability either because of differences in lens cap color, light intensity and contrast ratios, or non adherence to engraving specifications documented in the CECO Human Factors checklist. In all individual instances the deviations from the criteria were small and of no import. Upon reevaluation the HEDAT maintains that aside from the documented problem concerning the consistency and readability of the "blue" legend light indicators, the cumulative as well as individual impact of the other cited deviations is negligible. Therefore, new "blue" indicator light lens caps will be obtained and installed that meet the checklist criteria. No other lens caps will be changed and no "corrective action" will be taken on this non-problematic deviation.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 217
HED CATEGORY 3C
FSR PAGE 251

FINDING

Legend light type styles are not consistent throughout the control room.

RESPONSE

Character font styles on legend lights vary slightly depending on the vendor supplier. The legend lights are readable and the different font styles do not adversely affect operator performance.

NRC/SAIC COMMENT

The justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. Apparently related HEDs are numbers 192, 355, 509, 510, 511, 160, 216, 215, 283, 218, 219, 220, 221, 222, and 293.

CECO CLARIFICATION

One of the objectives of the multidisciplined HEDAT and particularly the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HEDs identified in the TER as related to this HED. These HEDs are concerned with the apparent lack of legend light discriminability either because of differences in lens cap color, light intensity and contrast ratios, or non adherence to engraving specifications documented in the CECO Human Factors checklist. In all individual instances the deviations from the criteria were small and of no import. Upon reevaluation the HEDAT maintains that aside from the documented problem concerning the consistency and readability of the "blue" legend light indicators, the cumulative as well as individual impact of the other cited deviations is negligible. Therefore, new "blue" indicator light lens caps will be obtained and installed that meet the checklist criteria. No other lens caps will be changed and no "corrective action" will be taken on this non-problematic deviation.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 218
HED CATEGORY 3C
FSR PAGE 252

FINDING

Legend lights on the reactor panel (on H13-P603) have white markings on black backgrounds. The guideline recommends black markings on white backgrounds. (Photo Log No. B-22)

RESPONSE

These displays are easy to read since they are backlit. A separate annunciator is in place to alert the operators to a related trip.

NRC/SAIC COMMENT

The justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. Apparently related HEDs are numbers 192, 355, 509, 510, 511, 160, 216, 215, 283, 217, 219, 220, 221, 222, and 293.

CECO CLARIFICATION

One of the objectives of the multidisciplined HEDAT and particularly the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HEDs identified in the TER as related to this HED. These HEDs are concerned with the apparent lack of legend light discriminability either because of differences in lens cap color, light intensity and contrast ratios, or non adherence to engraving specifications documented in the CECO Human Factors checklist. In all individual instances the deviations from the criteria were small and of no import. Upon reevaluation the HEDAT maintains that aside from the documented problem concerning the consistency and readability of the "blue" legend light indicators, the cumulative as well as individual impact of the other cited deviations is negligible. Therefore, new "blue" indicator light lens caps will be obtained and installed that meet the checklist criteria. No other lens caps will be changed and no "corrective action" will be taken on this non-problematic deviation.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCDR.

HED # 219
HED CATEGORY 3C
FSR PAGE 253

FINDING

The stroke width-to-height ratio for some legend lights is not between the recommended 1:6 and 1:8.

RESPONSE

The small deviation in stroke width-to-height ratios (1:4.29 - 1:11) for legend lights does not pose any difficulties in operator readability.

NRC/SAIC COMMENT

The justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. Apparently related HEDs are numbers 192, 355, 509, 510, 311, 160, 216, 215, 283, 217, 218, 220, 221, 222, and 293.

CECO CLARIFICATION

One of the objectives of the multidisciplined HEDAT and particularly the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HEDs identified in the TER as related to this HED. These HEDs are concerned with the apparent lack of legend light discriminability either because of differences in lens cap color, light intensity and contrast ratios, or non adherence to engraving specifications documented in the CECO Human Factors checklist. In all individual instances the deviations from the criteria were small and of no import. Upon reevaluation the HEDAT maintains that aside from the documented problem concerning the consistency and readability of the "blue" legend light indicators, the cumulative as well as individual impact of the other cited deviations is negligible. Therefore, new "blue" indicator light lens caps will be obtained and installed that meet the checklist criteria. No other lens caps will be changed and no "corrective action" will be taken on this non-problematic deviation.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 220
HED CATEGORY 3C
FSR PAGE 254

FINDING

The letter width-to-height ratio for some legend lights is not between 1:1 and 3:5.

RESPONSE

The small deviation in width-to-height letter ratios (1:1.83 - 1:2.71) for legend lights does not pose any difficulties in operator readability.

NRC/SAIC COMMENT

The justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. Apparently related HEDs are numbers 192, 355, 509, 510, 511, 160, 216, 215, 283, 217, 218, 219, 221, 222, and 293.

CECO CLARIFICATION

One of the objectives of the multidisciplined HEDAT and particularly the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HEDs identified in the TER as related to this HED. These HEDs are concerned with the apparent lack of legend light discriminability either because of differences in lens cap color, light intensity and contrast ratios, or non adherence to engraving specifications documented in the CECO Human Factors checklist. In all individual instances the deviations from the criteria were small and of no import. Upon reevaluation the HEDAT maintains that aside from the documented problem concerning the consistency and readability of the "blue" legend light indicators, the cumulative as well as individual impact of the other cited deviations is negligible. Therefore, new "blue" indicator light lens caps will be obtained and installed that meet the checklist criteria. No other lens caps will be changed and no "corrective action" will be taken on this non-problematic deviation.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 221
HED CATEGORY 3C
FSR PAGE 255

FINDING

The space between characters of legend lights is not the recommended minimum of one stroke-width.

RESPONSE

The small deviation in space between characters for legend lights (.0030 inches) does not pose any difficulties in operator readability.

NRC/SAIC COMMENT

The justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. Apparently related HEDs are numbers 192, 355, 509, 510, 511, 160, 216, 215, 283, 217, 218, 219, 220, 222, and 293.

CECO CLARIFICATION

One of the objectives of the multidisciplined HEDAT and particularly the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HEDs identified in the TER as related to this HED. These HEDs are concerned with the apparent lack of legend light discriminability either because of differences in lens cap color, light intensity and contrast ratios, or non adherence to engraving specifications documented in the CECO Human Factors checklist. In all individual instances the deviations from the criteria were small and of no import. Upon reevaluation the HEDAT maintains that aside from the documented problem concerning the consistency and readability of the "blue" legend light indicators, the cumulative as well as individual impact of the other cited deviations is negligible. Therefore, new "blue" indicator light lens caps will be obtained and installed that meet the checklist criteria. No other lens caps will be changed and no "corrective action" will be taken on this non-problematic deviation.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 222
HED CATEGORY 3C
FSR PAGE 256

FINDING

The minimum space between lines on some legend lights is not at least one half the character height.

RESPONSE

The small deviation (.15 inches) in space between characters for legend lights does not pose any difficulties in operator readability.

NRC/SAIC COMMENT

The justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. Apparently related HEDs are numbers 192, 355, 509, 510, 511, 160, 216, 215, 283, 217, 218, 219, 220, 221, and 293.

CECO CLARIFICATION

One of the objectives of the multidisciplined HEDAT and particularly the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HEDs identified in the TER as related to this HED. These HEDs are concerned with the apparent lack of legend light discriminability either because of differences in lens cap color, light intensity and contrast ratios, or non adherence to engraving specifications documented in the CECO Human Factors checklist. In all individual instances the deviations from the criteria were small and of no import. Upon reevaluation the HEDAT maintains that aside from the documented problem concerning the consistency and readability of the "blue" legend light indicators, the cumulative as well as individual impact of the other cited deviations is negligible. Therefore, new "blue" indicator light lens caps will be obtained and installed that meet the checklist criteria. No other lens caps will be changed and no "corrective action" will be taken on this non-problematic deviation.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
ACCEPT AS IS

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCDR.

HED # 293
HED CATEGORY 3C
FSR PAGE 257

FINDING

Legend messages on some legend light indicators contain more than three lines of text. (Photo Log No. H-11, H-12)

RESPONSE

Each legend line on legend lights (except for those on the reactor panel) contains one word (or abbreviation) and are easily readable to the operators in a timely manner. Typically, on the reactor panel, one light cover may house two status lights - each light with its own legend.

NRC/SAIC COMMENT

The justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. Apparently related HEDs are numbers 192, 355, 509, 510, 511, 160, 216, 215, 283, 217, 218, 219, 220, 221 and 222.

CECO CLARIFICATION

One of the objectives of the multidisciplined HEDAT and particularly the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HEDs identified in the TER as related to this HED. These HEDs are concerned with the apparent lack of legend light discriminability either because of differences in lens cap color, light intensity and contrast ratios, or non adherence to engraving specifications documented in the CECO Human Factors checklist. In all individual instances the deviations from the criteria were small and of no import. Upon reevaluation the HEDAT maintains that aside from the documented problem concerning the consistency and readability of the "blue" legend light indicators, the cumulative as well as individual impact of the other cited deviations is negligible. Therefore, new "blue" indicator light lens caps will be obtained and installed that meet the checklist criteria. No other lens caps will be changed and no "corrective action" will be taken on this non-problematic deviation.

IMPLEMENTATION

ACCEPT AS IS

REVISED IMPLEMENTATION

ACCEPT AS IS

HED # 305
HED CATEGORY 3C
FSR-PAGE 319

Referenced on Page: TER Append. A2-17, A2-18

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 504
HED CATEGORY 3C
FSR PAGE 320

FINDING

The mimic lines depicting nuclear steam are not the same throughout the control room. On N62-P601, nuclear steam is mimicked in black; on H13-P601 it is mimicked in red.

RESPONSE

The black nuclear steam mimic on N62-P601 will be replaced with a red mimic to provide consistent use of color.

NRC/SAIC COMMENT

The justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. Apparently related HEDs are numbers 305, 178, and 306.

CECO CLARIFICATION

One of the objectives of the multidisciplined HEDAT and particularly the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HEDs identified in the TER as related to this HED. These HEDs are concerned with the apparent lack of consistency in the use of colors on the mimics as well as the apparent lack of sufficient contrast between the colors used. Mimics are used on the cited panels as an operator aid. The HEDAT therefore feels that appropriate and consistent use of color on them is important. Consequently, mimics will be evaluated by a Human Factors Engineering specialist and an Operations representative to ensure their accuracy and to develop a consistent mimic color standard for use at the station that will be in consonance with the station's color usage standard. Mimic size and use of symbols will also be standardized. This will be accomplished in concert and coordination with the background shading and lines of demarcation programs.

IMPLEMENTATION
1ST REFUELING OUTAGE

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 178
HED CATEGORY 3C
FSR PAGE 321

FINDING

The arrows indicating flow directions for the containment monitoring and leak detection mimic on PM16J are not clearly marked. They are too small and are poorly contrasted with the mimic colors. (Photo Log No. H-21)

RESPONSE

The arrows on the containment monitoring and leak detections mimic will be painted white to improve the contrast.

NRC/SAIC COMMENT

The justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. Apparently related HEDs are numbers 305, 504, and 306.

CECO CLARIFICATION

One of the objectives of the multidisciplined HEDAT and particularly the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HEDs identified in the TER as related to this HED. These HEDs are concerned with the apparent lack of consistency in the use of colors on the mimics as well as the apparent lack of sufficient contrast between the colors used. Mimics are used on the cited panels as an operator aid. The HEDAT therefore feels that appropriate and consistent use of color on them is important. Consequently, mimics will be evaluated by a Human Factors Engineering specialist and an Operations representative to ensure their accuracy and to develop a consistent mimic color standard for use at the station that will be in consonance with the station's color usage standard. Mimic size and use of symbols will also be standardized. This will be accomplished in concert and coordination with the background shading and lines of demarcation programs.

IMPLEMENTATION
1ST REFUELING OUTAGE

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 306
HED CATEGORY 3C
FSR PAGE 326

FINDING

Symbols on mimics are not used consistently.

RESPONSE

Control room operators are aware of mimic symbols. The symbols have caused no confusion for the operators.

NRC/SAIC COMMENT

The justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. Apparently related HEDs are numbers 305, 504, and 178.

CECO CLARIFICATION

One of the objectives of the multidisciplined HEDAT and particularly the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HEDs identified in the TER as related to this HED. These HEDs are concerned with the apparent lack of consistency in the use of colors on the mimics as well as the apparent lack of sufficient contrast between the colors used. Mimics are used on the cited panels as an operator aid. The HEDAT therefore feels that appropriate and consistent use of color on them is important. Consequently, mimics will be evaluated by a Human Factors Engineering specialist and an Operations representative to ensure their accuracy and to develop a consistent mimic color standard for use at the station that will be in consonance with the station's color usage standard. Mimic size and use of symbols will also be standardized. This will be accomplished in concert and coordination with the background shading and lines of demarcation programs.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 237
HED CATEGORY 2C
FSR PAGE 344

FINDING

Complex symbols for the benchboard CRTs have seven picture elements per symbol height.

RESPONSE

Complex symbols are readable to the operators. The small deviation from the guidelines does not affect performance.

NRC/SAIC COMMENT

The justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. Apparently related HEDs are numbers 240, 309, 308, 128, 130 and 131.

CECO CLARIFICATION

The following response addresses seven HEDs the NRC felt to be related (see the NRC/SAIC Comment above). The HEDAT upon evaluation of these HEDs feels they are peripherally related at best. Four of the HEDs deal with CRT hardware issues while three deal with color graphic software issues, i.e., consistent use of color. One of the objectives of the multidisciplined HEDAT and particularly the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HEDs identified in the TER as related to this HED. These HEDs are concerned with the readability/comprehensibility and use of color of the control room computer CRT displays. The following comments relate to the HEDAT's reevaluation of the CRT hardware issues while the final paragraph is concerned with the use of color issues. Though the CRTs in use at LaSalle are of graphic quality, they do not contain the amount of picture elements per square inch suggested by the CECO guidelines and NUREG 0700 for the display of Complex shapes. The HEDAT maintains that "complex" shapes are not presented on the control room CRTs and hence there is no need to, "distinguish between them". Consequently, the current CRTs are adequate.

Concerning the issue of use of color, LaSalle station adheres to a green board color coding convention in which the color "green" denotes a "Normal" condition and the color "red" denotes an "Abnormal" condition when the unit is above 30% power. The CECo computer display conventions currently do not use green board coding, which in part accounts for the cited discrepancies. The feasibility of using green board coding for the computer graphics is being explored at CECo's Byron PWR station. Several displays have been modified and their use is being evaluated. One problem is that green board coding does not provide for indication of equipment status beyond normal/abnormal, for example, open/closed, on/off, etc. Resolutions to this problem are being evaluated at the station. When the "green board convention" computer graphics problems have been successfully resolved, that convention will be implemented at LaSalle if feasible.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 240
HED CATEGORY 2C
FSR PAGE 345

FINDING

Alpha-numeric characters for the benchboard terminals have 5 picture elements per character height, which is less than the recommended 10.

RESPONSE

Alpha-numeric characters on the CRTs are readable to the operators. The deviation from the guidelines does not affect performance.

NRC/SAIC COMMENT

The justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. Apparently related HEDs are numbers 237, 309, 308, 128, 130 and 131.

CECO CLARIFICATION

The following response addresses seven HEDs the NRC felt to be related (see the NRC/SAIC Comment above). The HEDAT upon evaluation of these HEDs feels they are peripherally related at best. Four of the HEDs deal with CRT hardware issues while three deal with color graphic software issues, i.e., consistent use of color. One of the objectives of the multidisciplinary HEDAT and particularly the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HEDs identified in the TER as related to this HED. These HEDs are concerned with the readability/comprehensibility and use of color of the control room computer CRT displays. The following comments relate to the HEDAT's reevaluation of the CRT hardware issues while the final paragraph is concerned with the use of color issues. Though the CRTs in use at LaSalle are of graphic quality, they do not contain the amount of picture elements per square inch suggested by the CECO guidelines and NUREG 0700 for the display of Complex shapes. The HEDAT maintains that "complex" shapes are not presented on the control room CRTs and hence there is no need to, "distinguish between them". Consequently, the current CRTs are adequate. Nonetheless, it is recognized that the control room environment and its needs are dynamic, as are the technological advancements in "picture presentation", eg. CRTs vs. LCDs. As equipment reaches its service life and is replaced further evaluations will be made to determine whether the resolution quality of the CRTs needs to be upgraded. At such times CECO will endeavor to adhere to the published criteria.

Concerning the issue of use of color, LaSalle station adheres to a green board color coding convention in which the color "green" denotes a "Normal" condition and the color "red" denotes an "Abnormal" condition when the unit is above 30% power. The CECo computer display conventions currently do not use green board coding, which in part accounts for the cited discrepancies. The feasibility of using green board coding for the computer graphics is being explored at CECo's Byron PWR station. Several displays have been modified and their use is being evaluated. One problem is that green board coding does not provide for indication of equipment status beyond normal/abnormal, for example, open/closed, on/off, etc. Resolutions to this problem are being evaluated at the station. When the "green board convention" computer graphics problems have been successfully resolved, that convention will be implemented at the LaSalle Station if feasible.

IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCDR.

HED # 309
HED CATEGORY 2C
FSR PAGE 350

FINDING

Fifty resolution elements/inch are not used for graphics displays on CRTs as recommended by the guidelines.

RESPONSE

High resolution graphics are not required for the type of graphical information used in the control room.

NRC/SAIC COMMENT

The justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. Apparently related HEDs are numbers 237, 240, 308, 128, 130 and 131.

CECO CLARIFICATION

The following response addresses seven HEDs the NRC felt to be related (see the NRC/SAIC Comment above). The HEDAT upon evaluation of these HEDs feels they are peripherally related at best. Four of the HEDs deal with CRT hardware issues while three deal with color graphic software issues, ie., consistent use of color. One of the objectives of the multidisciplined HEDAT and particularly the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HEDs identified in the TER as related to this HED. These HEDs are concerned with the readability/comprehensibility and use of color of the control room computer CRT displays. The following comments relate to the HEDAT's reevaluation of the CRT hardware issues while the final paragraph is concerned with the use of color issues. Though the CRTs in use at LaSalle are of graphic quality, they do not contain the amount of picture elements per square inch suggested by the CECO guidelines and NUREG 0700 for the display of Complex shapes. The HEDAT maintains that "Complex" shapes are not presented on the control room CRTs and hence there is no need to, "distinguish between them". Consequently, the current CRTs are adequate.

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IMPLEMENTATION
ACCEPT AS IS

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 308
HED CATEGORY 2C
FSR PAGE 351

FINDING

A 5x7 dot matrix is used for characters on CRTs instead of a 7x9 dot matrix.

RESPONSE

The difference in legibility in the control room operating environment between the 5x7 and 7x9 dot matrix is minimal. The operators report no difficulty in reading CRT characters.

NRC/SAIC COMMENT

The justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. Apparently related HEDs are numbers 237, 240, 309, 128, 130 and 131.

CECO CLARIFICATION

The following response addresses seven HEDs the NRC felt to be related (see the NRC/SAIC Comment above). The HEDAT upon evaluation of these HEDs feels they are peripherally related at best. Four of the HEDs deal with CRT hardware issues while three deal with color graphic software issues, ie., consistent use of color. One of the objectives of the multidisciplined HEDAT and particularly the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HEDs identified in the TER as related to this HED. These HEDs are concerned with the readability/comprehensibility and use of color of the control room computer CRT displays. The following comments relate to the HEDAT's reevaluation of the CRT hardware issues while the final paragraph is concerned with the use of color issues. Though the CRTs in use at LaSalle are of graphic quality, they do not contain the amount of picture elements per square inch suggested by the CECO guidelines and NUREG 0700 for the display of Complex shapes. The HEDAT maintains that "Complex" shapes are not presented on the control room CRTs and hence there is no need to, "distinguish between them". Consequently, the current CRTs are adequate.

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ACCEPT AS IS

REVISED IMPLEMENTATION
2ND REFUELING OUTAGE

HED # 128
HED CATEGORY 2C
FSR-PAGE 352

Referenced on Page: TER Append. A2-25, A2-26

HED # 130
HED CATEGORY 2C
FSR-PAGE 353

Referenced on Page: TER Append. A2-27, A2-28

LASALLE STATION
REVISED RESPONSE/CLARIFICATION TO HEDS REFERRED TO
IN THE NRC'S SAFETY EVALUATION (SE) OF THE DCRDR.

HED # 131
HED CATEGORY 2C
FSR PAGE 354

FINDING

The color yellow is used in CRT displays for lettering outlines and point IDs. According to criteria, yellow should be used to indicate hazard, potentially unsafe, caution, attention required or that a marginal parameter value exists.

RESPONSE

Yellow was used for lettering outlines and point IDs because of its high contrast and readability.

NRC/SAIC COMMENT

The justification of this individual HED does not appear to consider the cumulative or interactive effect of other related HEDs. Apparently related HEDs are numbers 237, 240, 309, 308, 128 and 130.

CECO CLARIFICATION

The following response addresses seven HEDs the NRC felt to be related (see the NRC/SAIC Comment above). The HEDAT upon evaluation of these HEDs feels they are peripherally related at best. Four of the HEDs deal with CRT hardware issues while three deal with color graphic software issues, i.e., consistent use of color. One of the objectives of the multidisciplinary HEDAT and particularly the participation of the Lead Human Factors Specialist was to ensure that cumulative and/or interactive effects were considered when HEDs were assessed. This in fact was done at the time of the original HEDAT, though admittedly not specified on each HED's response. Nonetheless, cumulative/interactive effects were re-evaluated by the HEDAT for the HEDs identified in the TER as related to this HED. These HEDs are concerned with the readability/comprehensibility and use of color of the control room computer CRT displays. The following comments relate to the HEDAT's reevaluation of the CRT hardware issues while the final paragraph is concerned with the use of color issues. Though the CRTs in use at LaSalle are of graphic quality, they do not contain the amount of picture elements per square inch suggested by the CECO guidelines and NUREG 0700 for the display of Complex shapes. The HEDAT maintains that "Complex" shapes are not presented on the control room CRTs and hence there is no need to, "distinguish between them". Consequently, the current CRTs are adequate.

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ACCEPT AS IS

REVISED IMPLEMENTATION
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