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Docket Nos. 50-272
and 50-311

Mr. C. A. McNeill, Jr.
Vice President, Nuclear
Public Service Electric and Gas Company
Post Office Box 236
Hancocks Bridge, New Jersey 08038

Dear Mr. McNeill:

Enclosed for your information are the meeting minutes for the July 1, 1986 meeting concerning the Detailed Control Room Design Review (DCRDR).

A followup meeting on the DCRDR has been tentatively set for September 23, 1986. Much of the material discussed in these minutes will provide the agenda matter for the September 23rd meeting.

Sincerely,

Original signed by:

Donald C. Fischer, Project Manager
Project Directorate #3
Division of PWR Licensing-A

Enclosure:
As stated

cc: See next page

PD#3 DCF
DFischer
8/22/86

cc:
Mark J. Wetterhahn, Esquire
Conner and Wetterhahn
Suite 1050
1747 Pennsylvania Avenue, NW
Washington, DC 20006

Richard Fryling, Jr., Esquire
Assistant General Solicitor
Public Service Electric & Gas Company
P. O. Box 570 - Mail Code T5E
Newark, New Jersey 07101

Gene Fisher, Bureau of Chief
Bureau of Radiation Protection
380 Scotch Road
Trenton, New Jersey 08628

Mr. John M. Zupko, Jr.
General Manager - Salem Operations
Public Service Electric & Gas Company
Post Office Box E
Hancocks Bridge, New Jersey 08038

Robert Traae, Mayor
Lower Alloways Creek Township
Municipal Hall
Hancocks Bridge, New Jersey 08038

Thomas Kenny, Resident Inspector
Salem Nuclear Generating Station
U.S. Nuclear Regulatory Commission
Drawer I
Hancocks Bridge, New Jersey 08038

Richard F. Engel
Deputy Attorney General
Department of Law and Public Safety
CN-112
State House Annex
Trenton, New Jersey 08625

Frank Casolito, Action Chief
Bureau of Radiation Protection
Department of Environmental Protection
380 Scotch Road
Trenton, New Jersey 08628

Richard B. McGlynn, Commission
Department of Public Utilities
State of New Jersey
101 Commerce Street
Newark, New Jersey 07102

Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, Pennsylvania 19406

Lower Alloways Creek Township
c/o Mary O. Henderson, Clerk
Municipal Building, P.O. Box 157
Hancocks Bridge, New Jersey 08038

Mr. Bruce A. Preston, Manager
Nuclear Licensing & Regulation
Public Service Electric & Gas Company
P. O. Box 236
Hancocks Bridge, New Jersey 08038

Mr. David Wersan
Assistant Consumer Advocate
Office of Consumer Advocate
1425 Strawberry Square
Harrisburg, Pennsylvania 17120

NRC Meeting on July 1, 1986
With
Public Service Electric and Gas Company
Concerning the
Detailed Control Room Design Review
for the
Salem Nuclear Generating Station

The NRC met with Public Service Electric and Gas (PSE&G) Company to discuss the unresolved issues for the Detailed Control Room Design Review (DCRDR) being conducted at the Salem Nuclear Generating Station. A meeting was held March 21, 1986, which resulted in some clarification of PSE&G's DCRDR methodologies and of NRC concerns on the unresolved issues. The primary purpose of the meeting held July 1, 1986, was to resolve those human engineering discrepancies (HEDs) considered open items by the NRC. The meeting also included further discussion on the unresolved issues regarding DCRDR methodologies. The meeting resulted in most, but not all, open items being resolved, with additional information on several HEDs and issues still to be provided by PSE&G. Also, PSE&G's draft guidelines for human factors design in the Salem control rooms were provided to the NRC for review. The following are the results of discussions held in the meeting, including the NRC judgments on PSE&G's responses to the unresolved HEDs and the control room human factors guidelines. Attachment A to this report is a list of meeting attendees.

- Qualifications and Structure of the DCRDR Team

  As previously documented in NRC reports, PSE&G has satisfied this requirement.

- Function and Task Analysis, and Comparison of Display and Control Requirements With a Control Room Inventory

  PSE&G will include a task analysis of information and control requirements and needed characteristics in its effort to upgrade its present EOPs to symptom-based EOPs. The results of this analysis, the EOP walk-throughs (and verification of requirements in the control rooms), and information from the setpoint study relevant to the task analysis will be submitted by PSE&G to the

NRC. The acceptability of this effort in closing out these requirements will be determined by the NRC's review of PSE&G's submittal.

- Control Room Survey

A review of the draft "Salem Nuclear Generating Station Control Room Human Factors Guidelines," provided by PSE&G in the meeting, found this document to be acceptable as guidelines for development of corrections to HEDs, application to the present control room, and use for future changes. If PSE&G intends to make its present control room lettering and labeling, abbreviations, and color coding consistent with these guidelines (e.g., Section 1, Section 2.5, and Section 3), then the NRC's concern is satisfied regarding the adequacy of the standardized abbreviation list, color-coding conventions, and lettering guidelines.

These guidelines refer to application to areas of the plant other than the control rooms (e.g., remote shutdown panels). The NRC commends such application and encourages PSE&G to establish consistency among the plant areas where operators and others must interface, including the SPDS and EOPs.

- Assessment of HEDs and Selection of Design Improvements

The consideration of cumulative and interactive effects of HEDs by PSE&G will be reflected in the individual and overall HED corrections. The NRC found this response to be accceptable and will complete its review of such consideration as PSE&G provides final responses to the remaining, unresolved HEDs.

- Verification That Improvements Will Provide the Necessary Corrections Without Introducing New HEDs

As previously mentioned in the Control Room Survey section of this report, the draft of the guidelines provided in the meeting were found to be acceptable for developing HED corrections. In addition, these guidelines are also acceptable as a basis from which HED corrections can be verified. Provided that all sections of

the guidelines are applied to HED corrections, then the NRC's concern regarding the basis for verifying HED corrections will have been satisfied.

- Coordination of the DCRDR With Other Improvement Programs

  General Physics Corporation, PSE&G's human factors consultant, will be developing a program plan for coordinating the post-TMI activities for PSE&G. PSE&G should provide information which describes the plans for coordinating the post-TMI activities (if not the program plan itself) and training for review by the NRC.

- Implementation Scehdule for HED Corrections

  PSE&G stated that the implementation of HED corrections will occur over the next three refueling outages (approximately 4.5 years). The NRC does not agree with the schedule and believes that without sufficient justification, the implementation of HED corrections should occur over the next two refueling outages (approximately 3 years).

- Resolution of HEDs

  Appendices A through D of SAIC's Supplement to its Technical Evaluation Report (dated December 2, 1985) contains the lists of HEDs found to be acceptably and unacceptably resolved from a review of PSE&G's Supplementary Summary Report (SSR) (dated September 16, 1985). These appendices (Attachment B to this report) served as an agenda for discussion during the July 1, 1986, meeting. The results of these discussions are presented below according to the order in which they appear in the appendices.

  Appendix A - HEDs (by HED number) from Section 6.1 of the SSR in which resolutions were proposed and were found to be (1) acceptable, or (2) sufficiently described or resolved.

  Section 1 - PSE&G's proposed resolution to these HEDs remained acceptable to the NRC.

Section 2.a - PSE&G's proposed resolutions to these HEDs, except HED 583, were found to be acceptable by the NRC.

HED 583 - PSE&G will submit a description of the human factors review of the new Rad. computer system in the September timeframe.

Section 2.b. - PSE&G's proposed resolution to HEDs 25 and 306 were found to be acceptable. The following HEDs are still unresolved.

HEDs 97 and 98 - These HEDs concern the ability to communicate using the Scott air packs and emergency masks. PSE&G will check into the technology available which will correct these HEDs.

HED 667 - PSE&G will describe the results of a study and how this HED will be resolved.

Section 2.c - PSE&G's proposed resolutions to these HEDs were found to be acceptable.

Section 2.d - PSE&G's proposed resolution to this HED was found to be acceptable.

Appendix B - HEDs (by HED number) from Sections 6.2 and 6.3 of the SSR in which resolutions were proposed and were found to be (1) adequate or (2) insufficiently described or resolved. Discussion on the cumulative and interactive effects of HEDs was provided but found to be insufficient to resolve these concerns.

Section 1 - PSE&G's proposed resolutions to these HEDs remained acceptable to the NRC.

Section 2.a - PSE&G's proposed resolutions to the following HEDs were found to be acceptable:

2	80	152	320	430	523
6	114	204	358	478	625
13	121	282	402	521	635
19	126	313	405	522	658

The following HEDs are still unresolved:

HED 41 - PSE&G will study this HED further for possible corrective action.

HED 133 (and 39) - PSE&G's present response to this HED is inadequate. This HED will remain open until PSE&G develops an acceptable response or plan to mitigate this HED.

HEDs 533, 534, and 538 - Have been moved from this section for discussion in Section 3.e of Appendix B.

Section 2.b - PSE&G's proposed resolutions to these HEDs were found to be acceptable.

Section 2.c - PSE&G will provide more information on HEDs 3 and 5 describing the exact reach distance to the top-most control, what the control(s) is, and what effect or consequences operator errors associated with reach problems would have upon operations.

Section 2.d - PSE&G's proposed resolutions to these HEDs except HED 39 were found to be acceptable.

HED 39 (and 133) - PSE&G's present response to this HED is inadequate. This HED will remain open until PSE&G develops an acceptable response or plan to mitigate this HED.

Section 2.e - PSE&G's proposed resolution for HED 14 is that the SPDS will provide this information in a more readable location. However, the SPDS is not a qualified 1E instrument and is not reliable enough to be used as the primary source of this information. This HED will remain open until a more acceptable resolution is proposed by PSE&G.

Section 2.f - PSE&G's proposed resolution for this HED was found to be acceptable.

Section 2.g - PSE&G's proposed resolutions for these HEDs, except HED 140, were found to be acceptable.

HED 140 - PSE&G's response to this HED is pending corrective action on another HED. PSE&G will need to provide NRC with a response to this HED.

Section 2.h - PSE&G's proposed resolutions for these HEDs were found to be acceptable.

Section 3.a - NRC's position on the overall panel layout and control-display integration problem represented by the summation or product of the HEDs in this section is that PSE&G should improve the affected panels and components where possible. PSE&G has stated that it intends to replace its Bailey controllers and to add demarcation to improve control-display association and grouping. PSE&G has also stated that while it does not have the vertical arrangement of control-display associates as recommended in NUREG-0700, the horizontal arrangement of control-display associations it has in the Salem control rooms is consistent. PSE&G will investigate viable improvements to control board layout and control-display associations and report to the NRC on its final plan for this.

Section 3.b - PSE&G's proposed resolutions for these HEDs were found to be acceptable.

Section 3.c - PSE&G will be obtaining a new computer system and will provide information describing how the new computer system resolves each of these HEDs.

Section 3.d - PSE&G will provide a response to each of the four HED groups or areas.

Section 3.e - PSE&G will provide a response describing how the new annunciator system will resolve these HEDs, including HEDs 533, 534, and 538.

Appendix C - HEDs (by HED number) from Section 6.3 of the SSR in which rationale for the assessment was provided and found (1) to be acceptable, (2) to be unacceptable, or (3) was not provided at all.

Section 1 - PSE&G's proposed assessments for these HEDs remained acceptable to the NRC.

Sections 2 and 3 - PSE&G's rationale and proposed assessments for these HEDs were found to be accepable.

Appendix D - HEDs from Section 6 of the SSR which are associated with labeling discrepancies and should be addressed by the application of satisfactory standards or guidelines.

A review of the draft "Salem Nuclear Generating Station Control Room Human Factors Guidelines," provided by PSE&G in the meeting, found this document to be acceptable as guidelines for developing corrections to the HEDs in Appendix D of the SAIC STER. If HEDs are corrected to be consistent with Sections 1, 2, and 3 of these guidelines, then these HEDs with the exception of HED 244 will have been resolved acceptably. HED 244 includes a color-coding inconsistency involving the colors green and blue to indicate "normal" status. The control color-coding conventions listed in Table 1 of Section 3 of the guidelines does not decree a color code for "normal." PSE&G should clarify how this HED will be cor-

rected and whether a modification to the control color-coding convention will be made.