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APR 2 1982

Docket Nos.: STM 50-456
and STM 50-457

Mr. Louis O. DelGeorge
Director of Nuclear Licensing
Commonwealth Edison Company
Post Office Box 767
Chicago, Illinois 60690

Dear Mr. DelGeorge:

Subject: Human Factors Engineering Branch Control Room Review - Braford



Background

As part of the NRC task actions following the TMI-2 accident (Item I.D.1, NUREG-0660, May 1980, and NUREG-0737, November 1980), we require all licensees and applicants for operating licenses to conduct a Detailed Control Room Design Review (DCRDR) to identify and correct human engineering discrepancies (HEDs). The DCRDR should be performed in accordance with NUREG-0700, "Guidelines for Control Room Design Review," issued September 1981.

Applicants for operating licenses who are unable to complete the DCRDR prior to licensing are required to conduct a Preliminary Design Assessment (PDA) of their control rooms to identify significant human factors and instrumentation problems and to establish a schedule, subject to NRC approval, for correcting HEDs. These applicants are also required to complete a DCRDR.

NRC Control Room Design Review/Audit

In those cases where licensing schedules permit, the applicant may elect not to perform a PDA, but rather may plan to perform a DCRDR prior to licensing. You should inform us no later than 60 days after receipt of this letter of your intentions as to which review (PDA and/or DCRDR) you will be performing.

Applicants intending to conduct a PDA of their control rooms are advised that the NRC will also conduct an independent on-site Control Room Design Review (CRDR). During the site visit we will review and audit the applicant's PDA report submitted to the NRC. This review will be considered by the NRC as a prior condition to issuance of an operating license.

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A PDR

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The objective of our site visit is to make a preliminary evaluation of the control room including, but not limited to, the following:

1. The adequacy and availability of information presented to the operator to indicate plant status for normal operation, anticipated operational occurrences, and accident conditions;
2. Grouping of displays;
3. Layout of control panels;
4. Improvements in safety monitoring;
5. Human factors enhancement of control and displays;
6. The communications from the control room to points outside the control room, such as the on-site Technical Support Center. (This communication link must also be coordinated with new requirements for transmission of plant systems data to NRC);
7. The use of direct rather than derived signals for the presentation of process and safety information to the operator;
8. The categorization of alarms, with unique definition of safety alarms;
9. The physical location of the shift supervisor's office;
10. The remote shutdown panel controls and displays.

Control Room Visit Schedule

In order for us to schedule the human factors review of your control room, 60 days after receipt of this letter please indicate the degree of completion to date and the planned date for completing each of the following items:

1. Overall control room construction and checkout of Engineering Safety Feature (ESF) system controls and displays;
2. All systems, including ESF systems, turned over to the operating staff;
3. Normal and emergency lighting systems operational;
4. Air conditioning and ventilation systems operational;
5. Installation and powered operation of control boards and display panels;

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6. Emergency Operating Procedures (EOPs) will be sufficiently complete to permit a human factors evaluation using trained operators;
7. Applicant will have available, as a minimum, three (3) qualified operators (preferably licensed) to assist NRC during the CRDR;
8. Annunciator systems will be operational to permit evaluation of sequences of operations, readability of alarm windows, and measurement of all individual alarm sound levels;
9. Remote shutdown panel will be available for human factors reviews;
10. Incore thermocouple displays and subcooling monitor displays will be available for NRC review in the control room. (Applies to PWRs only.);
11. Applicant's PDA of its control room will be submitted to the NRC at least one month prior to the scheduled visit;
12. Control room (layout drawing and control panel) will be included with item 11 above;
13. Process computer and all peripherals will be operational and available for human factors review;
14. Operator workspace and environment will be similar to conditions.

Applicant's Preliminary Design Assessment (PDA)

One month prior to our scheduled visit, which will be based on your response to the above 14 criteria, please forward the results of your PDA to us. We request that the format of the control room PDA be structured such that it contains a numbered listing of human engineering discrepancies (HEDs) with a proposed corrective action and implementation schedule for each HED. As with the DCRDR the PDA should be prepared using the guidance provided in NUREG-0700.

In addition, we request that you send us the following data, photographs, and information along with your PDA;

1. Photographs (see enclosure 1 for suggested format);
2. Control room and control panel layout drawings (see enclosure 2 for details);

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- 3. A list of abbreviations and acronyms used on panels/systems/subsystems;
- 4. A description of the control room color code standard; and
- 5. The name(s) and phone number(s) of the contact(s) at the control room.

Site Visit Assistance

To assist the staff in its site review, your cooperation is requested in the following ways;

- 1. Admittance of several people to the control room as needed for the duration of the visit;
- 2. Three (3) qualified control room operators to assist the staff for the duration of the visit;
- 3. Permission to use video and audio recording equipment and photographic equipment in the control room;
- 4. Access to copies of system operating procedures used in control room operations;
- 5. Availability of consultants and other technical personnel who helped prepare the PDA;
- 6. Office or working space for the review team;
- 7. An arrangement for security clearances for the team equipment;
 - video camera, recorder and tripod
 - 35mm cameras
 - tape recorders
 - film
 - sound level measuring equipment
 - light level measuring equipment
 - temperature/humidity measuring equipment
 - briefcases.

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- 8. A briefing and debriefing with plant and utility management personnel authorized to commit to making control room design changes.

NRC Control Room Design Review/Audit Report

Following the on-site CRDR, NRC will prepare a report which will be provided to the applicant for review and comment. A subsequent NRC/applicant meeting will be held to discuss the report. This meeting will establish the necessary control room design improvement (and their schedules for implementation) and will result in input to the Safety Evaluation Report.

Where an applicant elects to perform the PDA and it has a replica control room simulator which is or will be constructed in advance of the control room, we will consider performing our preliminary control panel assessment at the simulator. In this case, we would still need your response to the items listed on pages 2 and 3, applicable to the construction and operating status of the simulator.

If the requested responses can not be made on the schedule indicated, please advise us of date(s) when you can provide the requested information. This request should use the identification number 620.1. If you have any questions, contact K. Kiper at (301/492-7037), the Project Manager.

This request for information was approved by the Office of Management and Budget under Clearance Number 3150-0065 which expires May 31, 1983.

Your cooperation in this matter is appreciated.

Sincerely,

Original signed by:
B. J. Youngblood

B. J. Youngblood, Chief
Licensing Branch No. 1
Division of Licensing

Enclosure:
As stated

cc w/enclosure:
See next page

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ENCLOSURE 1

SUGGESTED FORMAT

Photographs (binders)

1.1 8" x 10" Photographs

Photographs in the following manner:

- (a) Panorama Shots of the control room i.e., shots taken from the center of the room showing panel groups in horizontal series.

- (b) Upper, Middle, and Lower Close-up Shots of each panel, showing panel annunciator/display/console in vertical series.

1.2 These photographs should be accompanied by a floor plan drawing of the control room appropriately indexed to identify panel number/name with photographs.

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ENCLOSURE 2

Drawing (reduced for control room review use)

1. Elevation drawings of all control/display panels identifying panels/ systems/subsystems/groups/sub-groups and individual components. These drawings shall include the process computer and other control panels associated with the control room. The control room is defined to include all back panels and the remote shutdown panel.
2. Layout plans to include a floor plan to identify all spaces, work stations and equipment. All panels shall be identified by name and number.

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