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SUBJECT: Forwards suppl summary rept re DCRDR, providing description of how decisionmaking process implemented during review, including basis for leaving some human engineering discrepancies uncategorized.

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June 26, 1986

Mr. M. B. Fairtile
Project Manager (DOR)
U. S. Nuclear Regulatory Commission
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Gentlemen:

Docket 50-305
Operating License DPR-43
Kewaunee Nuclear Power Plant
TAC #56133
Detailed Control Room Design Review (DCRDR)
Supplemental Summary Report

References: 1) Letter from D. C. Hintz to H. L. Thompson dated June 28, 1985
2) Letter from M. B. Fairtile to D. C. Hintz dated May 6, 1986

By letter dated June 28, 1985 (Reference 1), Wisconsin Public Service Corporation (WPSC) submitted the Summary Report for the Kewaunee Nuclear Power Plant (KNPP) Detailed Control Room Design Review (DCRDR).

In Reference 2, you provided us with the final Technical Evaluation Report (TER) which was prepared by your consultant, Science Applications International Corporation (SAIC), and the final NRC Safety Evaluation Report (SER).

The final TER and SER indicated that additional information was needed from WPSC in order for the NRC to complete the review of this TAC item (#56133). As an attachment to this letter, WPSC provides the requested additional information.

Attachment 1 to this letter provides a description of how the assessment decision process was implemented during the review including the basis for leaving some HEO's uncategorized.

Attachment 2 provides a discussion of the color coding conventions used at KNPP. This information was requested at the meeting between WPSC and the NRC held in Bethesda, Maryland on February 12, 1986.

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Attachment 3 to this letter provides procedure ECP 4.2 entitled "Human Engineering Review Process for Control Room Modifications." This procedure describes the design improvement process, the process for verifying that control room improvements provide the necessary corrections, and the process for verifying that no unacceptable HED's are introduced into the control room as a result of these improvements, as well as any future control room modifications.

As indicated in procedure ECP 4.2 (Attachment 3), the first step in the process is to identify a need. The DCRDR provided the means to identify a need (i.e. failure to meet human factor guidelines, operator questionnaire, etc.). To this end, each HEO has been reviewed to more specifically define the "need." Attachment 4 to this letter provides a tabulation of each HEO and its associated "identified need." Now that a "need" has been identified rather than an arbitrary recommended fix, WPSC intends to implement ECP 4.2 for each "identified need." This will best define the hardware or software change which will correct the need yet provide assurance that no new HEO's are generated as a result of the fix.

Please be aware that any schedule for modification of this magnitude, particularly when they affect control room operations, can be volatile. WPSC plans to proceed as expeditiously as possible with the control room modifications, however, we place the highest priority on maintaining the control room in a safe condition. ECP 4.2 is specifically designed to ensure proposed changes are fully evaluated for potential safety concerns and that the final modifications do not introduce any new HEO's.

The DCRDR resulted in a total of 223 Human Engineering Observations (HEOs). Some of the modifications required to resolve these HEOs were easily identified and completed within a short time period after the observation was identified. To date, approximately 100 of these HEOs have been closed.

The fixes for the remaining HEOs were not as obvious and much more time consuming than those which have previously been closed. The remaining HEOs will be evaluated using ECP 4.2, to identify the best correction method to resolve the "identified need."

We have categorized the HEOs and will prioritize the implementation considering the importance to safety, other scheduled plant modifications, the logistics involved with the change, and the minimization of "negative transfer of learning" input on the operating personnel.

The implementation of the remaining modifications is expected to occur during 1987, 1988, 1989 and 1990. WPSC will be implementing ECP 4.2 and designing and procuring equipment necessary to complete the modifications on a continuing basis; however, by the nature of these control room changes most of the modifications can only be done during the refueling outages. If unforeseen circumstances arise and any of the modifications cannot be entirely completed by the end of the 1990 refueling outage, the 1991 refueling outage will be utilized to finalize the modifications.

We hope the information provided herein will enable you to complete your review of TAC #56133.

Sincerely,

E P Mathews for

D. C. Hintz
Manager - Nuclear Power

DSN/jms

cc - Mr. R. L. Nelson, US NRC
Mr. G. E. Lear, US NRC

Attachment 1

To Letter

From D. C. Hintz to M. B. Fairtile

Dated June 26, 1986

HEO Assessment and Categorization

Attachment 1

HEO Assessment and Categorization

As a result of the categorization process employed by the review team, there are ways an HEO may not have been categorized. First, those HEO's which the review team determined to be invalid observations were not given a category. The review team also indicated on the HEO form that it did not concur with the observation and gave reasons for not concurring. An invalid observation may have been made by the human factors expert due to a lack of understanding regarding a procedural step or plant system. Had the invalid observations been assigned a category of 4 (the lowest possible category), they would have been reevaluated during the evaluation of interactive and cumulative effects. This would be an unnecessary and wasteful use of review team effort.

The second way an HEO may remain uncategorized was to be one of many HEO's covered by a single HED. In fact, many of these HEO's were assigned a category of 4 or higher. The Assessment and Improvement Team (AIT), which consisted of personnel representing various disciplines within the WPSC organization, used their experience and judgment to analyze these HEOs to identify any cumulative or interactive effects of multiple HEOs. When assessed for cumulative effects, it was determined that only one category should be assigned to that "total effect" for a group of related HEOs. That single category was always higher than any of the individual HEO's. It was felt by the review team that it would be misleading to leave the lower categories on the individual HEO's, potentially resulting in inadequate attention being applied to that HEO. As a result, the categories for those HEO's covered by an "umbrella" HED were deleted.

Attachment 2

To Letter

From D. C. Hintz to M. B. Fairtile

Dated June 26, 1986

Color Coding Conventions

Attachment 2

Color Coding Conventions

The color coding criteria used during the KNPP Detailed Control Room Design Review (DCRDR) were NUREG-0700 guidelines 6.5.1.6 and 6.6.6.3. Since these color coding criteria had not been applied to the control room during original design, the guidelines did not apply to the existing control panels. However, the assessment and implementation team has recommended the use of color coding to resolve some design deficiencies. Future applications of color coding will be consistent with the aforementioned guidelines, where they do not conflict with current conventions.

During the survey phase of the DCRDR, WPSC reviewed the current conventions to ensure consistency in use. WPSC does use the standard Westinghouse convention of red, white, blue, and yellow colors for instrument channels as well as the red/green convention for control board lights.

Duel non-legend light indicators colored green and red are used to indicate equipment status. The green indicator is always located to the left, the red indicator on the right. When these indicators are associated with a specific control board control switch, they are located directly above that switch.

The green indicator is always used to indicate that the associated equipment is in the inactive, de-energized (breaker open) or closed (for valves; dampers or doors) state. The red indicator always indicates an active, energized or open state.

Attachment 3

To Letter

From D. C. Hintz to M. B. Fairtile

Dated June 26, 1986

Procedure ECP 4.2