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Downers Grove, Illinois 60515

February 22, 1991

Dr. Thomas E. Murley, Director  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

Attn: Document Control Desk

Subject: Byron Station Units 1 and 2  
Braidwood Station Units 1 and 2  
DCRDR Implementation  
NRC Docket Nos. 50-454/455 & 50-456/457

Reference: (a) Byron TAC #63249 & Braidwood TAC #64028

Dear Dr. Murley,

All Detailed Control Room Design Review (DCRDR) modifications have been completed for Byron Units 1 and 2 (TAC #63249). Byron Unit 1 DCRDR modifications were completed by March 1, 1990. Byron Unit 2 DCRDR modifications were completed by November 21, 1990. Braidwood Unit 1 DCRDR modifications (TAC #64028) are expected to be completed in the late spring of 1991. Braidwood Unit 2 DCRDR modifications are expected to be completed in late 1991. A letter confirming completion will be issued at that time.

This letter also serves to summarize the Byron and Braidwood DCRDR Human Engineering Discrepancies (HEDs) for which a change in the Implementation Classification commitment has been recommended by the Commonwealth Edison Human Factors Group. The final status of nineteen HEDs, which vary in Byron and Braidwood applicability, are provided for NRC staff review in the enclosure of this letter.

Contingent upon NRC staff acceptance of the HED changes, DCRDR implementation may be considered completed for Byron Units 1 and 2. Please direct any questions regarding this matter to this office.

Respectfully,

*Allen R. Chesca for*

Terence K. Schuster  
Nuclear Licensing Administrator

TKS/rg  
Enclosure

cc: A.H. Hsia - NRR  
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ENCLOSURE  
DCRDR CHANGES

HEDs COMMON TO BYRON AND BRAIDMOOD

HED 87

This HED identified the four flux recorders on the PM05J panel as unused and therefore unnecessary. They were to be removed by the end of the Second Refueling Outage (2RO). Subsequent station input indicated the recorders were used to provide indication of reactivity fluctuations across the core and were important in their current location. The Human Factors Group supported an HED recommendation change to Accept-As-Is.

HEDs 176, 388 and 470

These HEDs dealt with a lack of spatial correspondence between the Train A and B Centrifugal Charging Pumps control switches and their associated miniflow valve control switches. The HEDs were determined to be erroneous in subsequent evaluation and the Human Factors Group supported an HED recommendation change to Accept-As-Is.

HEDs 307 and 364

These HEDs concerned the lack of Number 2 RCP Seal Leakoff Flow indication in the control room. Indication was to be provided by the close of the 2RO. Although Flow indication doesn't exist, alarm indication does exist for high leakrate flow from the #2 seals, and low flow can be deduced from other seal alarms. This is adequate indication to determine whether a loop's Reactor Coolant Pump has leakrate flow from the #2 seals within the proper range to start the pump, especially during a transient situation. Given that the alarm indications are available and that financial and exposure dose rate costs would be very high, it is not cost effective to install flow rate indication for a low probability transient event. The Human Factors Group therefore supported an HED recommendation change to Accept-As-Is after interviewing operations personnel.

HEDs 349 and 407

These HEDs concerned zone banding on the MCB indicator cover plates. The commitment was to paint zone colors directly on the meter faces. Station Operations and Technical Staff personnel felt the corrective action to be non cost effective. Each indicator affected would have to be removed from the panel and its associated system/subsystem taken Out-Of-Service, disassembled from the rear, reassembled after painting, reinstalled in the panel, and undergo a Return-To-Service test. Moreover, without returning the indicator to the manufacturer for disassembly and assembly the component warranty would be voided. The current transparent tape approach to zone banding has served the function well for years, and is easy to modify as operating conditions warrant. Operations has implemented a procedure to survey the zone bands for physical condition and accuracy in order to address the Human Factors concern of the tape fraying and/or becoming dislodged over time. Human Factors reviewed and evaluated the condition of the zone banding tape at each station and found them satisfactory. The Human Factors Group supported an HED recommendation change to Accept-As-Is.

## ENCLOSURE - CONTINUED

HED 424

This HED was concerned with the Pressurizer Relief Tank "PRT PRESS HIGH" alarm setpoint. It was felt sufficient time was not available after alarm actuation to permit operators to take effective remedial action. Subsequent investigations indicated that no additional response time could be achieved without significant engineering modifications. Further, PRT pressure is typically controlled by draining the tank, an alternate and effective operating practice. Human Factors supported a recommendation to change the implementation to "Accept-As-Is".

HED 436

This HED concerned the audible distinguishability between the two RM-11 Radiation monitors console alarms for Unit 1 and Unit 2. The RM-11 consoles, though unit specific, actually display the status of a common parameter, that of the status of all Unit 1, 2 and common Process and Area Radiation monitors. Consequently, it is immaterial which unit "responds" to the alarm first. Both unit operators are required to be cognizant of radiation status plant wide, and both will respond to an alarm. Since there is no need to distinguish between monitors the HEDs have been closed as "Accept-As-Is".

HED 507

This HED would have reinstated alarms for Tempering Line Low Flow on the PM04J Feedwater/Steam Generator panel. These alarms had existed at the panel at initial criticality. During the engineering review associated with the modification to reinstall these alarms, it was discovered that the function of adjusting Tempering Line flow was to maintain an above ambient temperature at the Steam Generator upper feedwater nozzle. The specific Tempering Line flowrate varies with reactor power level. Engineering suggested that the low flow alarms would not be appropriate because temperature, as opposed to flow, is the critical parameter to be monitored. Upper nozzle temperature is already monitored by the process computer. A Tempering Line Low Flow alarm setpoint predicated upon high reactor power levels would be a nuisance alarm at low power operations. The Human Factors group concurred with the engineering synopsis from a function allocation perspective and changed the HED status to Accept-As-Is.

HED 540

This HED concerned the display of static information with the color Yellow on the RM-11 Radiation monitor CRTs and some plant Process Computer displays, specifically the Prodigy Trend displays. The color graphics hardware system used at Byron and Braidwood Stations is capable of producing eight colors; black, white, red, green, yellow, dark blue, cyan, and magenta. Black is reserved for the background; Red is reserved for danger/alarm/warning situations; Dark Blue and Magenta do not contrast well with the black background, are consequently difficult to see and are therefore infrequently used. This leaves only four colors with which displays can be built. Occasionally yellow and green must be used to highlight and display static objects because of the diversity and complexity of the information displayed. These were documented as acceptable uses for the colors in the Color Use Matrix chart response to Open Item 4 in the "Braidwood Safety Evaluation Report Supplement 4, Section 18 Response" submitted to the NRC in July 1987. The Human Factors Group has recommended Accept-As-Is status.

## ENCLOSURE - CONTINUED

## HEDs UNIQUE TO BYRON

HEDs 240 and 438

These HEDs concerned auditory levels. HED 240 identified a number of alarms that were not within +/- 2.5 db of the average of all signals. HED 438 was concerned with low PA system speaker volume in the control room. Auditory levels for both the annunciators and the PA speakers were set to specifications. Subsequently Operations personnel adjusted the levels to suit their own preferences. Generally the adjustment was to lower the sound level. The Human Factors Group evaluated the settings as they had been adjusted and found them slightly low but still detectable and acceptable. The Human Factors Group therefore recommended these HEDs be closed as "Accept-As-Is".

HED 410

This HED concerned the potential for accidental control switch actuation by traffic into and out of the primary operating area at the ends of the main control panel horseshoe. Guardrails were to be installed to minimize this potential. Since the conduct of the DCRDR the process of control room access has been procedurally modified. Personnel desiring access to the control room must now obtain verbal permission from the Shift Control Room Engineer (SCRE) whose duty station is the Center Desk. Personnel desiring access to a Unit's primary operating area must subsequently obtain verbal permission from the Unit operator. As a result, traffic patterns have been altered and entrance into or egress from the primary operating area via the horseshoe ends is no longer permitted except at the discretion of the unit operator. Human Factors considers this procedural control to be a satisfactory means of minimizing the potential for inadvertent control switch actuation at the ends of the horseshoe panel. Braidwood still intends to implement the original corrective action of installing guardrails. Byron opted to procedurally control access rather than install guardrails. These approaches are acceptable and the Human Factors Group has made a recommendation change to allow either approach to fulfill the commitment.



## ENCLOSURE - CONTINUED

## HEDs UNIQUE TO BRAIDWOOD

HED 217

This HED concerned correctly labeling an exhaust damper control switch on the OPM02J panel. However, before the label was fabricated and installed, the switch was removed from the panel. Since a label is no longer necessary, Human Factors Group recommended that removal of the exhaust damper switch was an appropriate corrective action for this HED.

HED 317

This HED concerned displays that had values to either end of a zero (0) midpoint without having an indicant of which side was positive/negative or in/out. Two components are listed (Main Generator 1, Output VARS, 1V1-MP006 and Voltage Regulator, 1E1-MP022) as needing a label on the meter face which indicates either a positive and negative or an "IN" and "OUT". The Main Generator component presently depicts "IN" and "OUT" on the meter face, while the Exciter Voltage Regulator meter does not require a positive and negative indication since it gives a deviation reading on either side of zero. Therefore, corrections to these two meters are considered unnecessary and the HED status has been changed to "Accept-As-Is".

HED 477

This HED described the desirability of having a start/stop control switch in the control room for the fire pumps to eliminate the need to dispatch an Equipment Operator (EO) to the Lake Screen house to accomplish those functions. This commitment was made to the NRC in the FSR. Subsequent to the DCRDR review the auto start feature of the pumps was improved significantly reducing the time criticality of dispatching the EO. Moreover, a review of NFPA Code 20 indicated that a remote stop switch would be contrary to code and therefore would be prohibited. The Human Factors Group concurs with a petition to modify the original response to "Accept-As-Is".

HED 552

This HED concerned switch position labels for the Pressurizer PORV controls on the PM05J panels. The control notches did not correspond exactly with the switch positions as labeled. Subsequent Human Factors evaluation determined the deviation magnitude did not warrant any further corrective action, and hence a change in status was made to "Accept-As-Is".