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Docket Number 50-346

License Number NPF-3

Serial Number 1820

August 1, 1990

Document Control Desk
United States Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Human Engineering Discrepancy (HED) Resolution Schedule

Gentlemen:

During the November 28 - 30, 1989, NRC audit of Toledo Edison's (TE) Detailed Control Room Design Review (DCRDR) Project, NRC's Audit Team requested the 1988 Summary Report - Disposition of Human Engineering Discrepancy be submitted. Toledo Edison's letter dated January 5, 1990 (Serial Number 1752) provided the report. The Summary Report contains copies of each of the 378 HEDs, which were dispositioned by the DCRDR Special Study Review Teams. The Report also contains background information, reference material, work summaries, component list, and other HED related information.

The Audit Team also requested an addendum to the Summary Report be submitted after the sixth refueling outage. The Addendum documents revisions to the original disposition of HEDs while the Summary Report is to remain unchanged to document the original disposition of the HEDs. Accordingly, TE hereby submits one copy of the Addendum.

Toledo Edison's letter dated November 22, 1989 (Serial Number 1727) stated that justification will be provided for those HEDs either not corrected or partially corrected by the end of the sixth refueling outage. Additionally, Toledo Edison was to provide an updated schedule for those HED items, including the rationale for schedule delays beyond the sixth refueling outage.

The attached Addendum to the 1988 Summary Report provides detailed justification and rationale for HED items scheduled beyond the sixth refueling outage. The following summarizes the HED status:

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THE TOLEDO EDISON COMPANY

EDISON PLAZA

300 MADISON AVENUE

TOLEDO, OHIO 43652

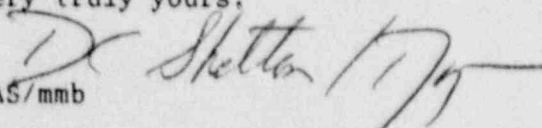
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1. Of a total of 378 HEDs identified, eight (8) operational enhancement HED items (1.7.009, 4.1.020, 5.1.001, 5.1.004, 5.1.028, 9.2.003, 9.2.027, and 9.8.044) will be completed either during Cycle 7 or by the end of the seventh refueling outage. See Attachment 2 for justification.
2. After additional review, TE determined that modifications/resolutions for portions of eight HED items (2.1.001, 3.1.009, 3.1.037, 5.1.004, 5.1.030, 9.2.002, 9.2.091, and 9.2.111) are not needed. See Attachment 1 for justification.
3. Seven HED items (5.1.010, 5.1.016, 5.1.017, 5.1.020, 5.1.025, 5.1.027 and 5.1.033) are operational enhancement items for various control room Bailey recorders and meters. These enhancements included correction of poor contrast between pointers and scales; poor visibility of data on recorders; poor quality pens that clog and smudge the paper; recorders that mechanically or electrically hang up; inadequate height of graduation marks; more than nine graduations between numerals on recorder scale; and pointers being too narrow. With the additional preventive maintenance that has been implemented, TE has determined that no additional corrective actions are required at the present time. It is noted that these recorders and meters are manufactured by the Bailey Meter Company and spare parts can no longer be obtained. Toledo Edison plans to replace these recorders and meters on an "as-fail" basis. Since the equipment currently adequately performs its intended design function and no significant operator burden is created by not replacing the equipment, TE considers the equipment adequate and longer term replacement acceptable.
4. The NRC SER for restart of Davis-Besse from the June 9, 1985, event outage (NUREG 1177) identified 29 safety significant HEDs requiring corrective action implementation by the end of the fifth refueling outage.

Those corrective actions deemed necessary to resolve the 29 safety significant HEDs were completed at the end of the fifth refueling outage with the exception of two corrective actions for a portion of HED Number 3.1.037. These corrective actions for HED 3.1.037 were completed during the sixth refueling outage as committed to in a previous submittal (Serial 1537).

If you have any questions concerning this matter, please contact Mr. R. W. Schrauder, Nuclear Licensing Manager, at (419) 249-2366.

Very truly yours,


RAS/mb

cc: P. M. Byron, DB-1 NRC Senior Resident Inspector
A. B. Davis, Regional Administrator, NRC Region III
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Utility Radiological Safety Board of Ohio

ATTACHMENT 1
JUSTIFICATION FOR NOT IMPLEMENTING
PORTIONS OF HEDs' CORRECTIVE ACTION

HED Number 2.1.001

Headsets for sound-powered phones are stored in wooden boxes throughout the plant. Metal boxes were to be installed by Facility Change Request (FCR) 83-0129 (Supplement 1). Since headset storage in metal boxes has a minimal impact on the control room operator, the implementation of FCR 83-0129 (Supplement 1) was deleted as part of the resolution of this HED.

HED Number 3.1.009

The Fire Protection Panel (C5796) alarm bell is too loud as confirmed by measurement [14 dB above ambient] and subjective evaluation. However, the alarm bell is required to meet Fire Protection Code standards. The amount by which the alarm noise level could be reduced, and still satisfy the NFPA Fire Code Standard, was so minimal that the implementation of the modification is not justified.

HED Number 3.1.037

For annunciators with multiple inputs, recommended actions included adding reflash or local panel acknowledgment/reset capability. An update of the original annunciator review was performed to take into account fifth refueling outage (5RFO) alarm modifications and to prioritize the need for reflash and local panel acknowledgment/reset. The prioritization was based on the likelihood of the occurrence of multiple inputs concurrently and included consideration of available redundant components and severity of consequences. Four priority levels were used, 1 being the highest priority (identifying those alarms that are most in need of reflash or local panel acknowledgment); priority 4 identifies those alarms where masking of subsequent inputs is least likely or where the consequence of this masking are less severe. As a result of this reevaluation and prioritization, corrective action requiring hardware changes (reflash or local panel acknowledgment/reset) were implemented for alarms in the top three priority levels only.

Window 6-5-A was initially categorized as a priority 2 window. When it was determined that local reset at the RCP monitoring and diagnostic cabinet will clear the window and allow reflash on subsequent alarms, reflash for window 6-5-A (SHAFT VIB HI, old window 6-1-1) was deleted from its associated modification. The RCP monitoring and diagnostic cabinet also has a display and printer to inform the operators of any alarm condition for any RCP vibration.

Window 16-4-B was initially categorized as a priority 2 window. Reflash for window 16-4-B (VOLTAGE REG TRBL, old window 16-2-2) was subsequently deleted from its associated modification based upon implementation of a design change for the addition of a loss of direct current voltage relay to the Voltage Regulator Control Circuit. Based upon this new configuration, the reflash capability is no longer required.

HED Number 5.1.004

This HED addressed the range of the condenser pressure recorder (PR 5330/531) as being too narrow (0 to 10 inches of Hg) and in need of being expanded to greater than 17 inches of Hg to cover alarms and turbine trip limits. Modification 88-0119 was written to implement this change.

After additional review, TE determined that the change is not required based on the following:

1. If the recorder scale is changed from 0-10 inches to 0-20 inches Hg, some loss of resolution at the low end (<5 inches) would occur. This change is not desired since the current scale of 0-10 inches is the normal operating band with the unit on-line.
2. HED 5.1.004 identified a concern that without a scale range covering automatic actions the operators may take actions that would cause unnecessary plant transients. (i.e., if the Control Room (CTRM) indication pegs out at 10 inches Hg, the operator may trip the MFPTs). As the MFPTs have redundant low vacuum trips and there is little chance of having a transient stabilize vacuum between 10 inches and 12.5 inches Hg, this concern is therefore not considered valid. Additionally, Abnormal Procedure DB-OP-02518 has been revised to remove the requirement for specific operator action at 12.5" Hga.

HED Number 5.1.030

Zone markers were not used on most control room meters, and the meters that have such markings were not conspicuously and distinctively marked. The Maintenance Work Order (MWO) 1-88-1721-00 series was initiated to install markings in accordance with the HED disposition. Based upon associated attempts at marking various instruments, it was concluded that the proposed resolution was impractical due to the clutter and obstruction of the meter scales created. The implementation of the disposition could introduce more human factors problems than it would correct. Therefore, this HED is closed without the installation of the zone markings.

HED Number 9.2.002

The service water (SW) valve controls HIS 2927 and HIS 2928 were to be grouped with other Control Room Emergency Ventilation (CREVS) controls by Modification 88-0093. Upon a field walkdown, this relocation was found to require extensive modification or rework of other nearby switches and terminal blocks.

Due to the impact involved in relocating these handswitches, and since the benefits to be gained were minimal, this modification was considered not to be justified. To compensate for not relocating these handswitches, labels were added to panel C5720 to identify the relationship between the service water and CREVS handswitches.

HED Number 9.2.091

To provide additional information for operators, a SFAS Actuated Alarm was to be added by Modification 88-0075. Since the human factors benefit derived from the modification was evaluated as marginal, the modification was voided. Furthermore, Safety Features Actuation Monitor (SAM) lights are provided on all SFAS components of the main control boards and provide additional indication of a SFAS actuation.

HED Number 9.2.111

To provide additional status for the Component Cooling Water (CCW) System, a temperature indicator on the outlet of the number 3 CCW heat exchanger was to be installed by Field Change Request (FCR) 81-0225. The number 3 CCW Heat Exchanger Temperature can be trended on a pen recorder, and the recording is adequate for normal operations. Furthermore, the temperature indicator was a desired convenience for normal operations and is not needed to verify proper emergency operation of the CCW system. Therefore, this modification is not planned to be implemented.

ATTACHMENT 2
JUSTIFICATION FOR DEFERRING
HEDs' CORRECTIVE ACTION
BEYOND THE SIXTH REFUELING OUTAGE (6RFO)

HED Number 1.7.009

Facility Change Request (FCR) 87-1208 was written to prevent operators from being shocked while replacing 120 V bulbs on the switchyard panel (C5723). Although some corrective actions have been taken (caution labels and proper tools), the modification was not completed during the sixth refueling outage. The modification to correct problems with the switchyard panel (C5723) is considered to be an operational enhancement, not critical to plant operation and can be scheduled to be implemented with the unit on-line. Modification 87-1208 is scheduled for cycle 7 (during operations following startup from the sixth refueling outage).

HED Number 4.1.020

Modification 88-0214 was implemented in order to establish the convention that motor operated throttle valves are provided with dual light indication when in mid-stroke position. This convention will provide the operators with a positive feedback indication for those valves that may be in mid stroke positions for extended periods of time. The current design is to have both red and green lights out during the valves mid stroke transit.

In the course of the review of Modification 88-0214 design package, it was discovered that five throttle valves were inadvertently omitted from the Modification. A new modification 89-0096 was written to provide dual light indication for these valves. Due to the design schedule for modification design preparation and the impact on the outage workload, it was determined by TE that Modification 89-0096 would not be scheduled for implementation during the sixth refueling outage. The basis for this decision is that this modification to these five valves is considered to be an operational enhancement, not critical to plant operation and can be scheduled to be implemented with the unit on-line. Modification 89-0096 is scheduled for cycle 7. As an interim measure during the sixth refueling outage, the five valves were labeled to identify them as operating differently until Modification 89-0096 is implemented.

HED Number 5.1.001

Simple Configuration Change (SCC) 88-1189 was written to modify the Diamond Rod Control Panel to increase the brightness of the indicator lights. Since the change is considered to be an operational enhancement and not critical to plant operation, SCC 88-1189 is scheduled to be implemented during the seventh refueling outage. Additionally, annunciators and computer alarms provide additional status of the control rod drive system.

HED Number 5.1.004

Modification 87-1208 was written to provide local level indication for the emergency diesel generator fuel oil tanks. Since local level indication is considered to be an operational enhancement and not critical to plant operation, Modification 87-1208 is scheduled for Cycle 7.

HED Number 5.1.028

SCC 88-1196 was written to provide improved scale graduations on flow meter FI578 (Condensate Pump Combined Flow) on panel C5714. Since this change to FI578 is considered to be an operational enhancement and not critical to plant operation, SCC 88-1196 is scheduled to be implemented during the seventh refueling outage.

HED Number 9.2.003

The scales for two AC rotary voltmeters (voltmeters EI 6016 and EI 6018) on the generator control panel currently reads 0-150 volts. However, the scale should read 0-345 kilovolts. Therefore, SCC 88-1193 was written to modify the scale for these meters to read 0-345 kilovolts rather than 0-150 volts. SCC 88-1193 was not completed during the sixth refueling outage because the replacement instruments for EI 6016 and EI 6018 were incompatible with the instrument loop. The revised modification package could not be completed in time to support the sixth refueling. Since the absolute voltage value is not critical to matching these voltage readings per procedure for generator synchronization, the change is considered to be an operational enhancement and not critical to plant operation. The modification is scheduled to be implemented during the seventh refueling outage.

HED NUMBER 9.2.027

A portion of HED item 9.2.027 cites inadequacy in the Safety Features Actuation System (SFAS) Cabinet Data Lights. Modification 87-1330 has been written to correct the inadequacy in HED item 9.2.027.

The SFAS Cabinet Data Light problem is related to the SFAS Cabinet indication and does not refer to the Control Room indications. These lights are not normally used or viewed by the operators during emergency operations. The problem with the ambiguous SFAS data lights is primarily a concern during surveillance testing and shift checks of the cabinets. The main concern is that misinterpretation of the lights could result in an unwanted actuation of SFAS equipment during surveillance testing, or an equipment problem could go undetected, when a half channel trip is present, during normal operations. Modification 87-1330 is scheduled for implementation during the seventh refueling outage.

The following is the basis for this decision:

1. To decrease the probability of unwanted component actuation, additional procedure guidance has been provided and operators have been trained on these changes.
2. Modification 87-1330 is considered to be an operational enhancement and not critical to plant operation.

HED Number 9.8.044

Facility Change Request 86-0031 and FCR 87-1325 was written to modify motor operated valves to provide lights which represent actual travel limits. Modification 86-0031 was implemented in the fifth refueling outage for all safety related valves. Modification 87-1325 was implemented in the sixth refueling outage for thirty-three valves. The remaining twenty-one balance of plant valves of Modification 87-1325 are scheduled during cycle 7 operations. The basis for this decision is that the modification is considered to be an operational enhancement, not critical to plant operation and does not require an outage to be implemented. The twenty-one valves are appropriately labeled to indicate the meaning of the limit lights.

DAVIS-BESSE

**DETAILED CONTROL ROOM
DESIGN REVIEW
(DCRDR)**

**HUMAN ENGINEERING
DISCREPANCY
(HED) REPORTS**

**1988 SUMMARY
ADDENDUM 1**

VOL. 1