

PHILADELPHIA ELECTRIC COMPANY

NUCLEAR GROUP HEADQUARTERS

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February 15, 1990

Docket No. 50-278

U.S. Nuclear Regulatory Commission
 Attn: Document Control Desk
 Washington, DC 20555

SUBJECT: Progress Report for Implementation of
 Control Room Enhancements Pursuant to NUREG-0737
 Peach Bottom Atomic Power Station, Unit 3

REFERENCE: 1) Letter, S. L. Daltroff, PECO, to
 D. R. Muller, USNRC, dated February 26, 1986;
 Subject: Control Room Design Review

2) Letter, E. P. Fogarty, PECO to USNRC
 dated June 30, 1989

In the reference 1 letter, which transmitted the Control Room Design Review (CRDR) Report, we stated that a progress report on the implementation of the control room enhancements would be submitted to the NRC within two months following completion of the next refueling outage for Peach Bottom Units 2 and 3. This letter provides the status of the control room enhancements as of the end of the 7th refueling outage for Unit 3. Reference 2 letter submitted the progress report as of the end of the 7th refueling outage for Unit 2.

The submittal of this report was delayed to allow for an independent verification of the control room enhancements status. We regret any inconvenience this delay may have caused.

In the CRDR Report, 262 Human Engineering Discrepancies (HEDs) were identified. Each HED was assigned a priority with respect to safety using a significance scale of 1 to 6, indicating the overall likelihood of the HED to cause operator error. Three (3) HEDs were assigned dual priorities. The HED priority categories and numbers of HEDs assigned to each were:

9002270222 900215
 PDR ADDUCK 05000278
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A046
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<u>Priority</u>		<u>Number of Unit 3 HEDs</u>	
		Identified	Resolved
1	High Safety Significance	10	10
2	Low Safety Significance	44	36
3	Operational Reliability	26	14
4	No Significant Improvement	94	66
5	Previously Corrected	52	NA
6	Not A Discrepancy	39	NA

The subject, schedule, and status of each identified Priority 1 and 2 HED are provided in Tables 1 and 2 of Attachment 1 to this letter. The status is presented as the actual outage the HED was resolved or the forecasted (F) outage during which the HED will be resolved. In summary, the corrective actions for all the Priority 1 HEDs scheduled for the 7th and 8th refueling outages have been completed for Unit 3. The corrective actions for 36 Priority 2 HEDs were also completed during the 7th refueling outage. The remaining Priority 2 HEDs, D5-09, I3-07, TA1-01, TA1-06, TA1-16, SP1-02, VW-11 and VW-12 will be resolved during the 8th refueling outage as originally scheduled or as indicated in Note 1 for Table 2 of Attachment 1.

During the implementation of the Priority 1 and 2 HEDs, the corrective actions for many Priority 3 and 4 HEDs were completed. The resolved Priority 3 and 4 HEDs are listed in Table 3 of Attachment 1.

"Yes" appears in the "HED REV" column of Tables 1 and 2 if corrective actions changed. The corrective actions for one dual Priority 1/2 HED and four Priority 2 HEDs have been revised, and one HED has been cancelled (no action required). The HED Assessment revisions are provided in Attachment 2.

PECO will update the NRC on the status of the control room enhancements annually as committed to in the Reference 1 letter. Should you have any questions regarding this progress report, please do not hesitate to contact us.

Very truly yours,

G. A. Hunger, Jr.

G. A. Hunger, Jr.
Director-Licensing
Nuclear Services Department

Attachments

cc: J. J. Lyash, USNRC Senior Resident Inspector
W. T. Russell, Administrator, Region I, USNRC

ATTACHMENT 1
Schedule and Status of
Human Engineering Discrepancies (HED)

Table 1 - Priority 1 HEDs

Table 2 - Priority 2 HEDs

Table 3 - Priority 3 and 4 HEDs

TABLE 1 - PRIORITY 1 HEDs

HED	Priority	Schedule	Actual/Forecast	HED REV
A1-09 Annunciator Silence Control	PRI 1	7th Refuel	7th Refuel	
D2-05 Mimic Flow Direction	PRI 1	8th Refuel	7th Refuel	
D3-03 Component String and Matrix Arrangement	PRI 1	8th Refuel	7th Refuel	
E1-02 P. A. System Access	PRI 1	8th Refuel	7th Refuel	
I3-01 Recorder Values	PRI 1	8th Refuel	7th Refuel	
I3-05 Multipoint Recorder Speed B: Replace Recorder TR2-2-3-89	PRI B:1	8th Refuel	7th Refuel	
SD2-03 Containment Isolation Mimic Arrangement	PRI 1	8th Refuel	7th Refuel	
SD3-23 Control/Display Relationships	PRI 1	7th Refuel	7th Refuel	
TA1-04 Isolation Summary Display	PRI 1	8th Refuel	7th Refuel	
TA1-07 Reactor Level - 172 inches A: Add Caution Tag	PRI A:1	7th Refuel	2/8/90*	Yes

*Due to a misunderstanding, the information tag was not added until February 8, 1990.

TABLE 2 - PRIORITY 2 HEDs

HED	Priority	Schedule	Actual/Forecast	HED REV
A1-12 "Alarm Clear" Indication	PRI 2	8th Refuel	7th Refuel	Yes
D5-01 Operation Limits & Warnings	PRI 2	8th Refuel	7th Refuel	
D5-02 Hierarchal Labeling	PRI 2	8th Refuel	7th Refuel	
D5-06 Redundant Label Information	PRI 2	8th Refuel	7th Refuel	
D5-09 Incomplete Labels	PRI 2	8th Refuel	8th Refuel(F) (See Note 2)	
I2-01 Indicator Zone Markings	PRI 2	8th Refuel	7th Refuel	
I3-03 Recorder Alarm Points	PRI 2	8th Refuel	7th Refuel	
I3-07 Recorder Pen Colors	PRI 2	8th Refuel	8th Refuel(F) (See Note 2)	
I3-11 Recorder Zone Markings	PRI 2	8th Refuel	7th Refuel	
I5-05 Inadvertent Control Activation	PRI 2	8th Refuel	7th Refuel	
P4-01 Feedback to operator	PRI 2	Dec 1987	7th Refuel	
SD3-14 HPCI Indications	PRI 2	8th Refuel	7th Refuel	
SD3-18 Control Grouping	PRI 2	8th Refuel	7th Refuel	
SD3-19 Control Grouping	PRI 2	8th Refuel	7th Refuel	
SD3-21 RHR Indicator Arrangements	PRI 2	8th Refuel	7th Refuel	
SD3-28 Reactor Mode Switch Location	PRI 2	8th Refuel	7th Refuel	
SP1-02 Procedure Terminology Update	PRI 2	See VW HEDs	See Note 1	
NRC2-11 Torus Level Zone Marking	PRI 2	Complete	7th Refuel	
NRC2-12 Reactor Level Accuracy	PRI 2	Complete	7th Refuel	
LER-06 Diesel Generator Restart Procedural Requirements	PRI 2	8th Refuel	7th Refuel	
LER-08 Valve Alignment Procedural Requirements	PRI 2	8th Refuel	7th Refuel	
LER-14 Reactor Vessel Heat-up Rate	PRI 2	8th Refuel	7th Refuel	
LER-18 Improper Switch Position	PRI 2	7th Refuel	7th Refuel	

TABLE 2 - PRIORITY 2 HEDs

	HED	Priority	Schedule	Actual/Forecast	HED REV
LER-19	Improper Valve Operation	PRI 2	8th Refuel	7th Refuel	
TA1-01	Reactor Cooldown Rate	PRI 2	With Computer Mod	8th Refuel(F)	
TA1-02	Reactor Level - 48 inches	PRI 2	8th Refuel	7th Refuel	
TA1-05	HPCI Initiation Signal	PRI 2	8th Refuel	7th Refuel	Yes
TA1-06	LPCI Flow Resolution	PRI 2	8th Refuel	8th Refuel(F)	
TA1-07	Reactor Level - 172 inches B: Zero Mark Scales	PRI 5:2	8th Refuel	7th Refuel	Yes
TA1-08	HPCI & RCC Manual Initiation	PRI 2	8th Refuel	7th Refuel	
TA1-09	CS Manual initiation	PRI 2	8th Refuel	7th Refuel	
TA1-10	LPCI Manual Initiation	PRI 2	8th Refuel	7th Refuel	
TA1-11	ADS Timer Reset	PRI 2	8th Refuel	7th Refuel	
TA1-16	SRV Instrument N2 Alarm	PRI 2	8th Refuel	8th Refuel(F)	Yes
TA1-17	TORUS Level Range	PRI 2	8th Refuel	7th Refuel	
TA1-20	TORUS Level 18.5 feet	PRI 2	8th Refuel	7th Refuel	
TA1-21	TORUS Air Space Temperature	PRI 2*	8th Refuel	Cancelled	Yes
TA1-22	TORUS Pressure Range	PRI 2	8th Refuel	7th Refuel	
VW-01	ADS Numbers	PRI 2	8th Refuel	7th Refuel	
VW-04	Orifice Bypass Valve Tag	PRI 2	8th Refuel	7th Refuel	
VW-06	Torus Pressure Instrument No.	PRI 2	8th Refuel	7th Refuel	
VW-11	ECCS Instrument Color Pads	PRI 2	8th Refuel	8th Refuel(F)	
VW-12	T-200 Series Nomenclature	PRI 2	7th Refuel	See Note 1	
VW-15	T-221 Valves Not Found	PRI 2	8th Refuel	7th Refuel	

* The revised HED disposition would change this priority to PRI 6. It is not our practice to revise a priority once established.

NOTES FOR TABLE 2, PRIORITY 2 HEDs

Note 1: Series T-200 procedures were completed prior to the end of the 7th Refueling outage. The need to revise the T-100 procedures is being reevaluated because of the flowchart format of these procedures.

Note 2: This HED is substantially complete. Only a few items remain.

TABLE 3 - RESOLVED HEDs
PRIORITY 3 AND 4

	HED	PRIORITY
A1-03	Annunciator Type Style	PRI 4
A1-06	Multi-Choice Alarms	PRI 4
A1-07	Annunciator Priority Coding	PRI 4
A1-08	Annunciator Identification	PRI 4
A1-10	Annunciator Control Arrangmt	PRI 3
D1-02	Console Control Reach Dist	PRI 4
D1-04	Mirror Imaging of Panels	PRI 4
D1-05	Uncovered Panel Holes	PRI 4
D2-01	Control Distinction	PRI 4
D2-02	Demarcation and Mimic Lines	PRI 3
D2-03	Demarcation Lines Contrast	PRI 4
D2-04	Mimic Flowpaths	PRI 3
D2-06	Mimic Consistency	PRI 4
D3-01	Control/Display Grouping	PRI 4
D3-04	Color Coding Consistency	PRI 3
D3-05	Control Display Height	PRI 4
D5-03	Panel Identification	PRI 4
D5-05	Label Type and Style	PRI 4
D7-01	Control Panel Access	PRI 4
D7-03	Movable Obstructions	PRI 4
D7-04	Low Control/Display Visibility	PRI 4
D7-06	Annunciator Location	PRI 4

TABLE 3 - RESOLVED HEDs
PRIORITY 3 AND 4

	HED	PRIORITY
E3-02	Protective Clothing	PRI 4
E4-02	Telephone Cords	PRI 4
I1-01	Controlier Height Low	PRI 4
I2-03	Scale Units	PRI 4
I2-04	Pointers Obscure Markings	PRI 4
I2-06A	Display Grouping	PRI 3
I2-08	Excessive Scale Graduations	PRI 4
I3-08	Recorder Marking Procedure	PRI 4
I5-02	Position Indication Labels	PRI 3
I5-03	Position Markings	PRI 3
I5-04	Control Height	PRI 4
I5-06	Label & Indicator Visibility	PRI 4
I5-07	Control Shape Coding	PRI 4
I5-08	Label & Pointer Visibility	PRI 4
I5-09	Emerg Control Identification	PRI 4
P1-04	Annunciator Response Card Identification	PRI 4
SD1-01	Opposing Surfaces Close	PRI 4
SD2-02	Containment Purge Mimic Arrangement	PRI 3
SD3-01	Control/Display Grouping	PRI 3
SD3-03	Air Ejector Indications	PRI 4
SD3-04	Air Ejector Controls	PRI 4
SD3-05*	Air Ejector Controls	PRI 3

*Enhanced by colored outline instead of colored field

TABLE 3 - RESOLVED HEDs
PRIORITY 3 AND 4

	HED	PRIORITY
SD3-06	Condensate Panel Control Grouping	PRI 4
SD3-08	Turbine Drain Controls	PRI 4
SD3-09	Drain Tank Dump Indications	PRI 4
SD3-10*	Drain Tank Drains	PRI 4
SD3-11	Recirc indications not Grouped	PRI 4
SD3-12	CRD Indications	PRI 4
SD3-13	HPCI Controls	PRI 4
SD3-15	Controls Arrangement	PRI 4
SD3-16	Display Arrangement	PRI 3
SD3-20	Containment Ventilation Control Arrangement	PRI 4
SD3-22	Drywell Pressure Indicator Arrangement	PRI 4
SD3-25	Indicator Arrangement	PRI 3
SD3-27	Control Color Coding	PRI 4
SD4-01	Label Location	PRI 4
SI1-01	High Module Location/Readability	PRI 4
SI2-01	Recorder Location Low	PRI 4
SI2-05	Selector Light Color	PRI 4
SI3-01	Recorder Pen Colors	PRI 4
SP1-01	Remote Shutdown Panel Procedures	PRI 4
ST1-01	Training Update on Enhancements	PRI 3

*Enhanced by colored outline instead of colored field

TABLE 3 - RESOLVED HEDs
PRIORITY 3 AND 4

	HED	PRIORITY
NRC2-01	Torus Recorder Scales	PRI 4
NRC2-02	Extra Scale on Chart	PRI 4
NRC2-03	Label Terminology	PRI 4
NRC2-05	Scale Increments Too Large	PRI 3
TA1-24	HPSW to RHR Drain	PRI 4
TA1-25	Reactor Pressure 330 PSIG	PRI 4
TA1-27	Reactor Pressure 150 PSIG	PRI 4
TA1-28	Reactor Torus Delta P	PRI 4
TA1-30	Procedural Reference	PRI 4
TA1-31	Procedural Reference	PRI 4
TA1-32	Generator Load 5%	PRI 4
TA1-33	Core Map Green Light	PRI 4
VW-03	Turbine Speed Label	PRI 4
VW-07	Torus instrument Color Pads	PRI 4
VW-08	HPSW to LPCI Mimic	PRI 4
VW-10	Location of Rx Instruments	PRI 4
VW-14	T-220 Step Not Clear	PRI 4

ATTACHMENT 2

Revised Human Engineering
Discrepancy (HED) Assessments

HED No. A1-12

HED No. TA1-05

HED No. TA1-07

HED No. TA1-16

HED No. TA1-21

PEACH BOTTOM
HED ASSESSMENT
REVISED 6/89

HED No. A1-12
EP = 8/PRI 2
Code D

TITLE: "Alarm Clear" Indication

COMMENT:

No indication exists for a cleared alarm

Item: 4.3.12

Ref: C6.4

Source: CRS

IDENTIFICATION:

Panel: All

Component: Annunciators

ID or Number: N/A

DESCRIPTION:

No special cue is available to an operator (e.g a slower blink rate) to indicate when an alarm input clears. The operator must determine, on his own, that the alarm has cleared.

RESOLUTION:

(Sched: None)

The previous resolution of this HED required the position of the internal annunciator slide switch to be engraved on the annunciator window. Alarm cards were to be revised to indicate the required setting. Guidelines for setting switches were to be provided. This resolution is revised. The slide switch position will not be engraved on the annunciator windows. Revised annunciator procedures have been prepared to show the required position of the slide switches.

TRAINING REQUIREMENTS:

Train operators in system for required settings.

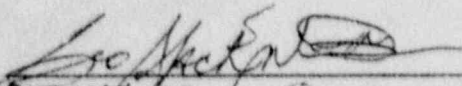
PROCEDURE REQUIREMENTS:

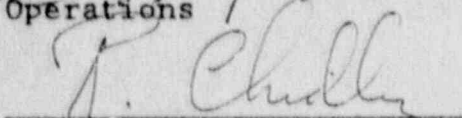
Revised annunciator window setting procedure now in place

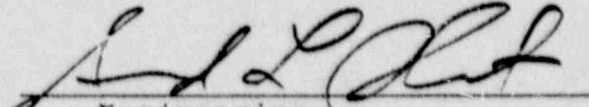
REASON FOR REVISION:

The desire for additional controls has led to generation of a station annunciator log/procedure in which the switch settings are controlled. The operating philosophy is to require aggressive followup on alarms. Further review shows that the originally conceived engravings would be confusing.

Team Approval Signature:


Operations


Human Factors


Engineering

() Add'l page(s) attached

PEACH BOTTOM
HED ASSESSMENT
REVISED 6/89

HED No. TA1-05
EP= /PRI 2
Code B

TITLE:
HPCI Initiation Signal

COMMENT:
No indication that ECCS initiation signal has been generated.

Item: N/A Ref: N/A Source: TA
IDENTIFICATION: Panel:
 Component:
 ID or Number: T-101 RC/Q, Step 1b

DESCRIPTION:
No indication that ECCS initiation signal has been generated.

(Rapid Action)

MITIGATING CONSIDERATIONS:

Annunciator alarms exist for Reactor Low Low Level and Drywell High Pressure, both initiating conditions for HPCI.

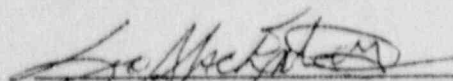
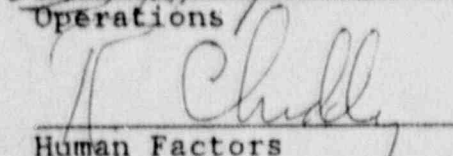
RESOLUTION: (Sched: Complete)
The Reactor Low Low Level and Drywell High Pressure are the only two conditions that initiate HPCI automatically.

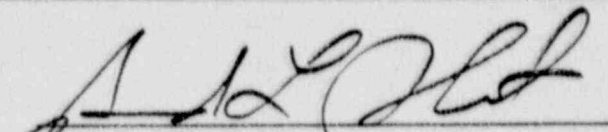
TRAINING REQUIREMENTS:
Additional training in meaning of colored annunciator windows

PROCEDURE REQUIREMENTS:
Station procedure for coloring annunciator windows.

REASON FOR REVISION:
Verification of HPCI initiation is by visual verification of HPCI flow. Annunciator windows are colored in accordance with the newly developed window coloring procedure.

Team Approval Signature:


Operations

Human Factors


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() Add'l page(s) attached

PEACH BOTTOM
HED ASSESSMENT
REVISED 6/89

HED No. TA1-07
EP = /PRI 1/2
Code C

TITLE: Reactor level -172 inches

COMMENT: Cannot read discrete level of -172 inches as required by procedure.

Item: N/A Ref: N/A Source: TA
IDENTIFICATION: Panel: 20C03, 20C04C
Component: LI-2-3-91, LR-2-3-110A/B, LI-2-3-113
ID or Number: T-101 RC/L, Step 3

DESCRIPTION:
There is no line on scale at -172 inches which is the top of active fuel. In addition, the level may not be correct when flow is present in jet pumps (e.g. Recirc or LPCI injection)
(Rapid action)

RESOLUTION: (Sched: Complete)

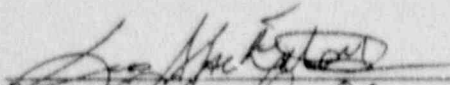
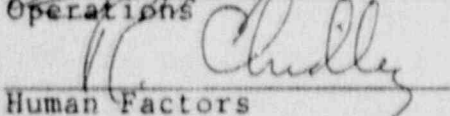
Zone mark scales to indicate -172 inches. Add an information tag to panels to indicate that there will be a level error when flow is present in jet pumps. A: Information tag Pri 1
B: Zone Mark Pri 2

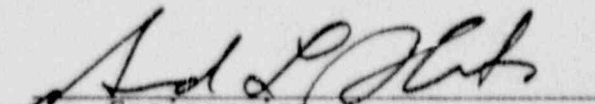
TRAINING REQUIREMENTS:
Train operators in meaning of zone markings.

PROCEDURE REQUIREMENTS:
New zone marking procedure now in place.

REASON FOR REVISION:
Indicator numbers changed by subsequent modifications. Caution tag changed to information tag. A future plant modification is expected to delete the requirement for this tag. No zone marking was applied to recorders LR-2-3-110A/B because of scale crowding (SEE HED NRC2-12). Zone marking added to indicators.

Team Approval Signature:


Operations

Human Factors


Engineering
() Add'l page(s) attached

FEACH BOTTOM
HED ASSESSMENT
REVISED 6/89

HED No. TA1-16
EP= /PRI 2
Code D

TITLE: SRV Instrument N2 Alarm

COMMENT: The alarm is too far away from the SRV Control Panel.

Item:	Ref:	Source: TA
IDENTIFICATION:	Panel: 20C209L Component: ADS NITROGEN HI/LOW Pressure ID or Number: T-101 RC/P, Step 9b	

DESCRIPTION:
The SRV controls are on Panel 20C03(2). To operate the SRVs, instrument N2 must be available. The absence of instrument N2 is announced by an alarm over Panel 20C09 approximately 28 feet away in the same plane.

(Deliberate Action)

RESOLUTION: (Sched: 8th Refuel)
(1) The original resolution of this HED was to color the alarm window amber to alert operators to take immediate action.
(2) The revised resolution is to move the alarm window to an annunciator associated with Panel 20C03(2).

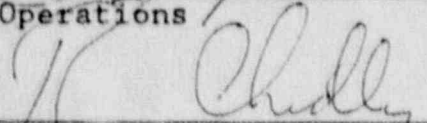
TRAINING REQUIREMENTS:
Train operators in new annunciator window location


PROCEDURE REQUIREMENTS:
Revise procedures to include new annunciator window location.

REASON FOR REVISION:
Recent modifications have added spare annunciator windows which were not available when this HED was originally written.

Team Approval Signature:


Operations


Human Factors


Engineering

() Add'l page(s) attached

PEACH BOTTOM
HED ASSESSMENT
REVISED 6/89

HED No. TA1-21
EP = /PRI 2
Code A

TITLE:
TORUS Air Space Temperature

COMMENT:
There is no indication of TORUS Air Space Temperature

Item:	Ref:	Source:
IDENTIFICATION:	Panel: N/A Component: N/A ID or Number: None	TA

DESCRIPTION:
There is no indication of TORUS air space temp.

MITIGATING CONSIDERATIONS:
Present method of determining TORUS temperature to initiate TORUS spray to allow air space to come into equilibrium with spray temperature, then read spray temperature.

RESOLUTION: (Sched: None)
Previous resolution was to install a TORUS air space temperature indicator. Revised resolution is to accept the condition as is.

TRAINING REQUIREMENTS:
None.

PROCEDURE REQUIREMENTS:
None.

REASON FOR REVISION:
Recent changes in EPGs have deleted the requirement to measure TORUS air temperature. No additional work to be done.

Team Approval Signature:

Operations

Human Factors

Engineering

() Add'l page(s) attached