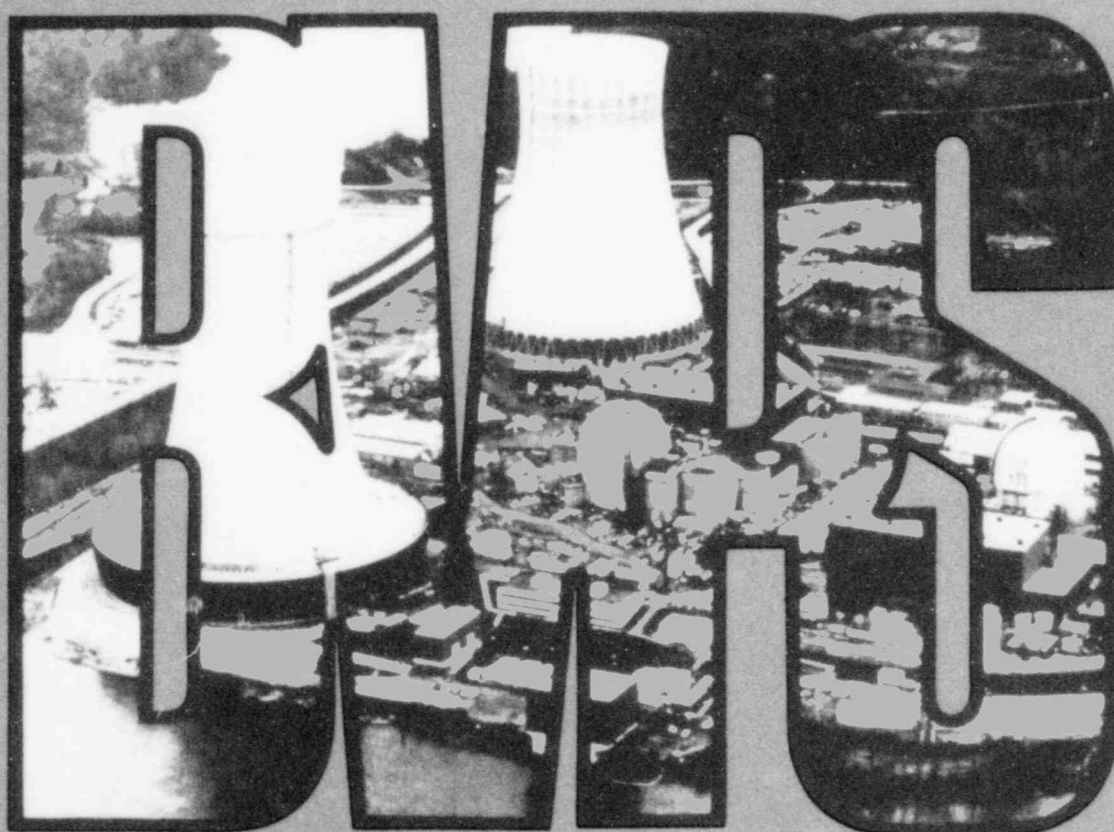


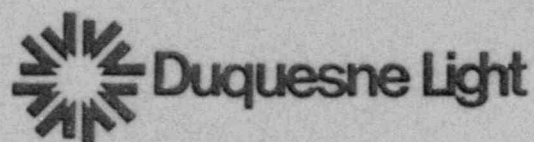
CONTROL ROOM DESIGN REVIEW

Human Engineering Discrepancies

Volume 3



BEAVER VALLEY POWER STATION UNIT 2



8512040132 851202
PDR ADOCK 05000412
F PDR

**BEAVER VALLEY
POWER STATION
UNIT - 2**

**CONTROL ROOM
DESIGN REVIEW**

Volume 3

VOLUME 3

HUMAN ENGINEERING DISCREPANCIES

C -- Resolution complete or in progress

E -- Equipment change required

L -- Label change required

P -- Procedure change required

No change required

C

RESOLUTION COMPLETE OR IN PROGRESS

a) BVPS - 2
PLANT/UNIT

b) ORIGINATOR: M. Francher

c) HED NO.: 2***-1201C

d) REVIEWED BY: D. J. Vandenby
(Westinghouse)

e) DATE: 2/19/85

CR Nos. 80, 81, 82, 83

[Signature]
(Essex)

f) HED TITLE: Arrangement of controls or displays
are not logical

g) ITEMS INVOLVED: See Attached

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.8.2.2

Components are not arranged in a logical, left-to-right or top to bottom sequence. They are not arranged to coincide w/operators expectations.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Validation of Control Room Functions (R-406)


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Operator's response may be incorrect or delayed.

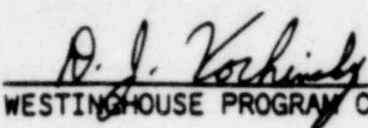
k) REVIEW AND RECOMMENDATIONS:

See attached sheets
for each individual recommendation.

Arrangement should take into consideration the
arrangement of corresponding controls in Unit 1.
For g) on attached sheets, the arrangement of these
controls on the ESP is correct. MCBs should match
the ESP arrangement.


ESSEX HUMAN FACTORS PROJECT MANAGER

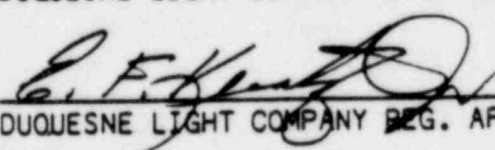

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

ITEM F LEAVE AS IS; panel is symmetrical for PAM.
all other changes approved

DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 7-25-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

c. Existing arrangement of ^{RF} 2

Pressurizer PORV relief valves
[2RCS* PCV 455D, 455C, 456]

and

Pressurizer PORV block valves
[2RCS* MOV 535, 536, 537]

535



BB1, 2 = Location

536



537



455D



456

455C

Suggestion: investigate ^{TDV} arrangement in Unit 1
and modify Unit 2 arrangement accordingly,
esp. if Unit 1 is in correct alphanumeric
sequence

RT acknowledges that provisions have been made
to rearrange controls in a logical alphanumeric order.
Reference: E & DCR No. 2PQ-1428

a) BVPS - 2
PLANT/UNIT

b) ORIGINATOR: M. Francher

c) HED NO.: 2***-1201 E

d) REVIEWED BY: D. J. Vandenby
(Westinghouse)

e) DATE: 2/19/85

CR Nos. 80, 81, 82, 83

[Signature]
(Essex)

f) HED TITLE: Arrangement of controls or displays
are not logical

g) ITEMS INVOLVED: See Attached

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.8.2.2

Components are not arranged in a logical, left-to-right or top to bottom sequence. They are not arranged to coincide w/operators expectations.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Validation of Control Room Functions (R-406)


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Operator's response may be incorrect or delayed.

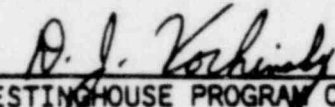
k) REVIEW AND RECOMMENDATIONS:

See attached sheets
for each individual recommendation.

Arrangement should take into consideration the arrangement of corresponding controls in Unit 1. For g) on attached sheets, the arrangement of these controls on the ESP is correct. MCBs should match the ESP arrangement.


ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

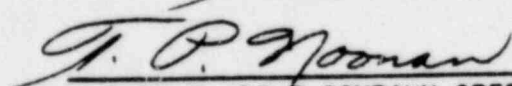

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

ITEM f LEAVE AS IS; panel is symmetrical for PAM.
all other changes approved

DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 7-25-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2VA9-2403

d) REVIEWED BY: A. J. Kochinsky e) DATE: 1/29/85
(Westinghouse)

CR No. 63

[Signature]
(Essex)

f) HED TITLE: Incorrect scale on trend recorder

g) ITEMS INVOLVED:

RCP seal leakoff flow JCHS - FR 154B

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

6.5.1.2 d.(2) Scale should be selected to:
Employ appropriate scale ranging techniques

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

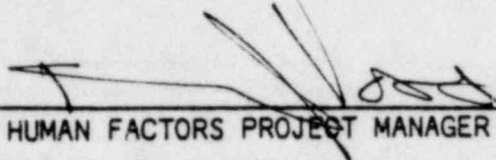
Verification of task performance capabilities;
• Suitability (2405) 6.2.1.2

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

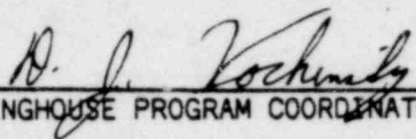
Operators response may be delayed

k) REVIEW AND RECOMMENDATIONS:

Existing scale for 154B is 0-200 gpm
recorder 154A is ~~0-200~~ 0-600 gpm
(MF) recommended to replace existing ^{recorder} ~~scale~~ ^{non}
154B with a ~~0-200~~ 0-1.0 gpm scale recorder, since a narrow
range recorder is needed.



ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

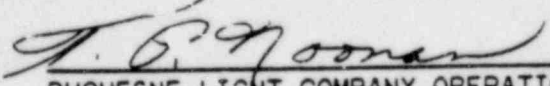

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Agree - agree with BV-1
Narrow range 0-1 gpm -


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS -2
PLANT/UNIT

B6?

b) ORIGINATOR: M. Francher

c) HED NO.: 2VB2-2404

d) REVIEWED BY: D. J. Kishin
(Westinghouse)

e) DATE: 3/25/85

[Signature]
(Essex)

f) HED TITLE: Incorrect label on temperature recorder

g) ITEMS INVOLVED: High Tave and Temperature Ref.
2 RCS-TR408
3 pen recorder

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.6.3.2 a.

Both the red and green arrows are labeled
Tave

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Validation of control room functions
(R406)

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Operator may take wrong reading


k) REVIEW AND RECOMMENDATIONS:

Replace label with an appropriate one. 41

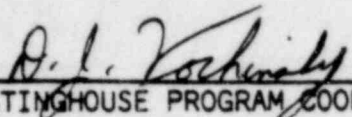
Red = Tave #1

Green = Tref #2

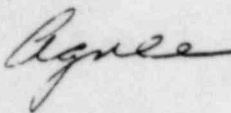
RT. recommends as per above


ESSEX HUMAN FACTORS PROJECT MANAGER

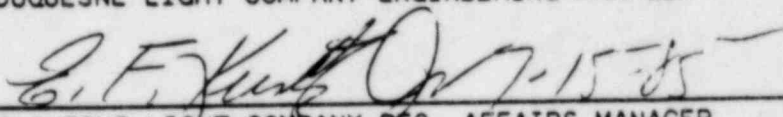

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

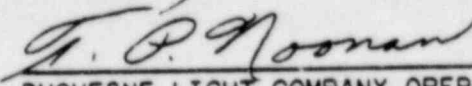

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:


Agree

 10-1-85
DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 7-15-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

CLARIFICATIONS TO HED No. 2VBZ-2404

THIS RECORDER IS LOCATED ON VERTICAL BOARD SECTION B6 NOT B2 AS INDICATED BY THE HED NUMBER. (ITEM 448 ON SWEC DRAWING P 12241 - RE-25M).

NOTE WHEN RELABELLING RECORDER THAT SWEC WIRING DIAGRAMS FOR THE VERTICAL BOARD SHOW PEN 1 IS "HIGH TAYR" AND PEN 2 IS "TREF".

A. Jones 9-16-85

a) BVPS - 2
PLANT/UNIT

5

b) ORIGINATOR: - M. Francher c) HED NO.: 2VC6-2402d) REVIEWED BY: D. J. Kichinsky
(Westinghouse) e) DATE: 1/29/85
CR No. 75f) HED TITLE: Incorrect Parameter labelled on
scaleg) ITEMS INVOLVED: 2FWS - LR 477 STM GEN 21 A LV1
21 B
21 Ch) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.6.1.1

Controls, displays and other equipment that must be located, identified, or manipulated should be appropriately and clearly labeled to permit rapid and accurate human performance.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Verification of task performance
Capabilities; Suitability (R-405) 6.2.1.2

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Operator may misinterpret displayed information.

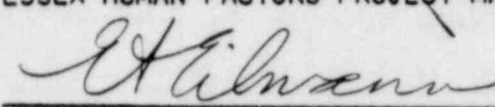
k) REVIEW AND RECOMMENDATIONS:

Parameter reads: [0-1400]

and 0-1400 ps g in the drawing. It
should be investigated whether ^{scale} range and parameter are
appropriate since this is a level recorder

Scale should be 0-100%


ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Agree change to 2%

DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2VCL-2012

d) REVIEWED BY: D. J. V. [Signature] e) DATE: 3/29/85
(Westinghouse)

CR No. 67

[Signature]
(Essex)

f) HED TITLE: PDWST level is expressed in inches -
but should be expressed in Feet

g) ITEMS INVOLVED:

PRI Plant Demin Wtr Stor Tk level
[2FWE* LI 104A1, A2]

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.5.1.2

Scale is not graduated and numbered so that readings are related in a direct and practical way to the operators tasks.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Validation of Control Room Functions

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Operators response may be delayed or incorrect.

k) REVIEW AND RECOMMENDATIONS: Change scale face to "feet" so that it will be presented in a more practical way.

RT suggests: make the change as listed above.

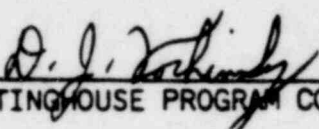
Procedures will also reference PDWST level in feet.



ESSEX HUMAN FACTORS PROJECT MANAGER

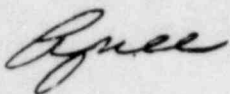


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER



WESTINGHOUSE PROGRAM COORDINATOR

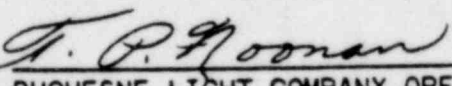
1) REVIEW AND DISPOSITION:



DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 7-15-85

DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER



DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: C. O'NEILL c) HED NO.: 2BB1-3026

d) REVIEWED BY: N/A e) DATE: 9/16/85
(Westinghouse)

N/A
(Essex)

f) HED TITLE: BLOCK SWITCHES IN AN ILLOGICAL ORDER

g) ITEMS INVOLVED:

344, 345, 346, 347, 360, 361

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

PRESENT - IR, PR, SR - SHOULD BE
SR, IR, PR.

6.9.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Review of Unit 1 HEDs.

(Unit 1 Control Room Survey)

Unit 1 HED No. 386

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

switches not arranged logically

k) REVIEW AND RECOMMENDATIONS:

SWITCHES SHOULD BE SOURCE RANGE,
INTERMEDIATE RANGE; POWER RANGE,
(TOP TO BOTTOM). THIS IS THE ORDER IN WHICH
THE SWITCHES WOULD BE USED DURING A POWER
ASCENSION.

N/A

ESSEX HUMAN FACTORS PROJECT MANAGER

E. T. Edmann / MED

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

N/A

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Agree to order change

R. E. Martin 11-15-85

DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

E. F. Kurtz Jr. 11-15-85

DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER

T. P. Noonan 11-15-85

DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

BEAVER VALLEY UNIT 1 HED REPORT

HED NO: 603 :	CDOR SOURCE: Survey 40 Int.																																																								
0700 GUIDELINE(S): 6.9	PHOTO NO:	LOCATION: 1001																																																							
DISCREPANCY: Recommender & Block ^{satellite} values - should be ordered w/ source (2) Intermediate, and (3) Power ck if done																																																									
POTENTIAL OPERATOR ERROR(S):																																																									
POTENTIAL CONSEQUENCES OF ERROR(S):																																																									
ERROR/CONSEQUENCE ANALYSIS: <div style="margin-top: 20px;"> <table style="width: 100%; border: none;"> <tr> <td style="width: 35%; text-align: right;">HISTORICALLY DOCUMENTED?</td> <td style="width: 10%; text-align: center;">(NO)</td> <td style="width: 10%; text-align: center;">YES</td> <td style="width: 10%;"></td> <td style="width: 35%;"></td> <td style="width: 10%;"></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>→</td> <td></td> </tr> <tr> <td style="text-align: right;">ACCIDENT RELATED?</td> <td style="text-align: center;">NO</td> <td style="text-align: center;">YES</td> <td>→</td> <td></td> <td style="text-align: center;">(A)</td> </tr> <tr> <td style="text-align: right;">VIOLATES TECH SPEC?</td> <td style="text-align: center;">NO</td> <td style="text-align: center;">YES</td> <td>→</td> <td></td> <td style="text-align: center;">(B)</td> </tr> <tr> <td></td> <td></td> <td></td> <td>→</td> <td></td> <td style="text-align: center;">(C)</td> </tr> <tr> <td style="text-align: right;">IS HED A PROBLEM?</td> <td style="text-align: center;">(YES)</td> <td style="text-align: center;">NO</td> <td>→</td> <td></td> <td style="text-align: center;">(D)</td> </tr> <tr> <td style="text-align: right;">ACCIDENT RELATED?</td> <td style="text-align: center;">(NO)</td> <td style="text-align: center;">YES</td> <td>→</td> <td></td> <td style="text-align: center;">(E)</td> </tr> <tr> <td style="text-align: right;">VIOLATES TECH SPEC?</td> <td style="text-align: center;">(NO)</td> <td style="text-align: center;">YES</td> <td>→</td> <td></td> <td style="text-align: center;">(F)</td> </tr> <tr> <td></td> <td></td> <td></td> <td>→</td> <td></td> <td style="text-align: center;">(G)</td> </tr> </table> </div>				HISTORICALLY DOCUMENTED?	(NO)	YES								→		ACCIDENT RELATED?	NO	YES	→		(A)	VIOLATES TECH SPEC?	NO	YES	→		(B)				→		(C)	IS HED A PROBLEM?	(YES)	NO	→		(D)	ACCIDENT RELATED?	(NO)	YES	→		(E)	VIOLATES TECH SPEC?	(NO)	YES	→		(F)				→		(G)
HISTORICALLY DOCUMENTED?	(NO)	YES																																																							
				→																																																					
ACCIDENT RELATED?	NO	YES	→		(A)																																																				
VIOLATES TECH SPEC?	NO	YES	→		(B)																																																				
			→		(C)																																																				
IS HED A PROBLEM?	(YES)	NO	→		(D)																																																				
ACCIDENT RELATED?	(NO)	YES	→		(E)																																																				
VIOLATES TECH SPEC?	(NO)	YES	→		(F)																																																				
			→		(G)																																																				

ERROR/CONSEQUENCE ANALYSIS (CONTINUED)

ERROR RECOGNITION/AUTO RECOVERY?

NO ☐

YES ☐

[DESCRIBE IF YES]

HED CORRECTIVE ACTION(S)

Change positions

CORRECTIVE ACTION(S) ANALYSIS (USE ATTACHED CHECKLIST)

BV-2 should be changed

RECOMMENDED RESOLUTION

Change positions of values

- ☐ ENHANCEMENT
- ☒ BOARD MOD
- ☐ INSTR. MOD
- ☐ REDESIGN
- ☐ PROCEDURE
- ☐ TRAINING
- ☐ OTHER

SCHEDULE PRIORITY

COMMENTS:

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2VC5-2405⁶

d) REVIEWED BY: W. J. Kachinsky
(Westinghouse) e) DATE: 3/19/85

F. W. W. W.
(Essex)
f) HED TITLE: Recorder scale values do not progress by
1, 2, 5 or 10

g) ITEMS INVOLVED:

Condenser Vacuum recorder Side A, B
2 CNM - PR 103
(0-30) in Hg-vac

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

Values on this scale are: [0, 6, 12, 18, 24, 30]
These do not progress by 1, 2, 5 or 10.
(6.5.1.5 a.(3))
6.5.4.1 c

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:


Validation of Control Room Functions (R406)

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

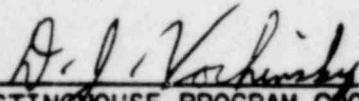
Can result in a delay in reading
the scale

k) REVIEW AND RECOMMENDATIONS: Correct the scale so the value indicated by unit graduations do progress by 1, 2, 5 or 10

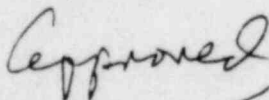
Suggest a dual scale with one of increasing accuracy and one of big vacuum. Graduations should progress by units of 1, 2, 5 or 10.

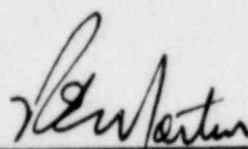

ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

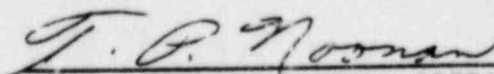

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:



 11-15-85
DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 11-14-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER

 11-15-85
DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2-BX-3015

d) REVIEWED BY: D. J. Korhonen
(Westinghouse) e) DATE: 3/19/85

T. J. V. V.
(Essex)

f) HED TITLE: Cold overpressure protection system
keylock switches missing

g) ITEMS INVOLVED: cold overpressure protection system

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.4.4.3

The control requirements for this system dictates that the function being controlled should be secured against ^{accidental} activation ~~by unauthorized personnel~~. Unit 1 has ^{MF} key-operated controls for this system.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Validation of Control room Functions (R-406)

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Operator may omit needed response

k) REVIEW AND RECOMMENDATIONS:

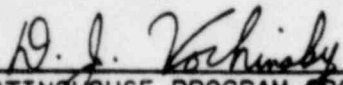
Install keylock switches on Benchboard ^{av.} B as in unit 1.

RT suggests that a keylock switch is preferred, however, if this cannot be installed, an alternative solution would be to install some type of guards to prevent accidental activation.

(NOTE: Unit 2 has different cold overpressure protection system which may not require key locks).


ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

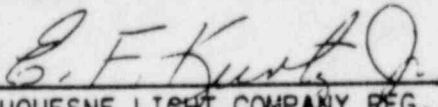

WESTINGHOUSE PROGRAM COORDINATOR

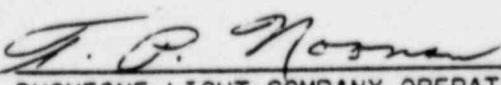
1) REVIEW AND DISPOSITION:

Install as at Unit 1.

Disagree Remartin
Use guard over
control Remartin

 11-15-85
DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 11-15-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER

 11-15-85
DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

L

LABEL CHANGE REQUIRED

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: N. K. F. J. C.

c) HED NO.: 2***-1101

d) REVIEWED BY: M. J. Catullo Jr.
(Westinghouse)

e) DATE: 11/7/84

T. J. V. S.
(Essex)

f) HED TITLE: INADVERTENT OPENING OF ACCUMULATOR DRAIN VALVE

g) ITEMS INVOLVED:

ACCUMULATOR DRAIN VALVE

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.6.1.1

AN ACCUMULATOR DRAIN VALVE WAS INADVERTENTLY OPENED
INSTEAD OF A FILL VALVE DURING THE PROCESS OF FILLING AN ACCUMULATOR.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER: LER Review DLCH R401A

LER 280-81039

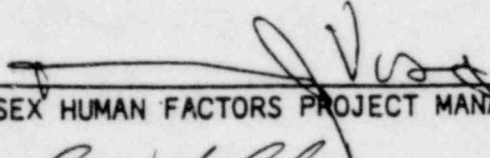
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

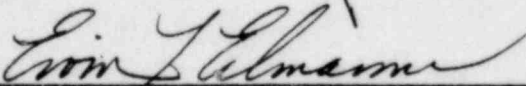
OPERATOR MANIPULATED THE WRONG VALVE [ERROR OF COMMISSION]


k) REVIEW AND RECOMMENDATIONS:

- ~~CHIEF ENGINEER PERSONNEL~~
- ADDITIONAL LABELING OR OTHER ENHANCEMENT TECHNIQUES SHOULD BE IMPLEMENTED TO AID IN DISTINGUISHING FILL VALVES FROM DRAIN VALVES

• Demarcation, hierarchical labeling, and improved component labels will help to avoid this type of event (REF. HED's 2***-1102, 1103)

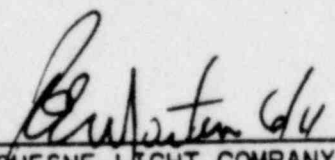

ESSEX HUMAN FACTORS PROJECT MANAGER

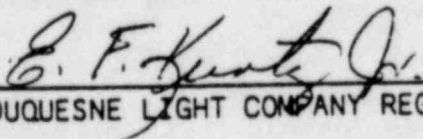

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

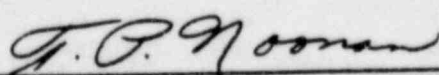

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

OK


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS / 2
PLANT/UNIT

b) ORIGINATOR: J. Downing c) HED NO.: 2***-1103

d) REVIEWED BY: W. J. Catullo
(Westinghouse) e) DATE: 8/3/84

[Signature]
(Essex)

f) HED TITLE: A hierarchical labeling scheme

g) ITEMS INVOLVED: All Control panel labels

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

A hierarchical labeling scheme should be used and ranked. Control panel does not comply with this criterion.
6.6.1.2.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

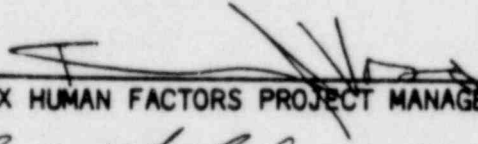
Labels and Location Aids Survey DLCIN R403
TP 6.1 B3.4

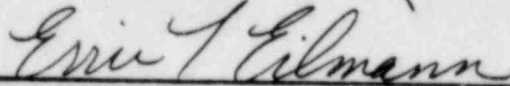
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:


Delay in activation of a correct control or activation of an incorrect control may result.

REVIEW AND RECOMMENDATIONS: use hierarchical labeling
item in accordance with 0700, Paragraph 6.6.1


ok.


ESSEX HUMAN FACTORS PROJECT MANAGER

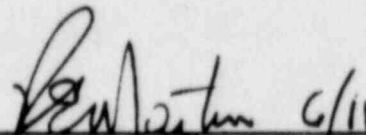

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

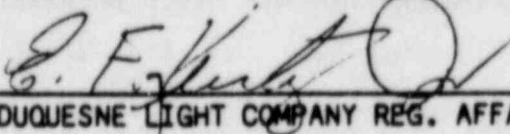

WESTINGHOUSE PROGRAM COORDINATOR

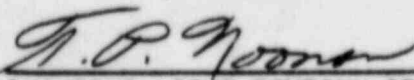
1) REVIEW AND DISPOSITION:



Need additional info. from team as
to plan of action.


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS / 2
PLANT/UNIT

b) ORIGINATOR: J. Downing c) HED NO.: 2###-1105

d) REVIEWED BY: W. J. Catlett Jr e) DATE: 2/3/24
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: No provision made for labels which identify functionally grouped controls or display.

g) ITEMS INVOLVED: All functionally grouped controls and display.

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

Labels do not identify functionally grouped controls or displays. 0700 Paragraph 6.6.3.7a.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

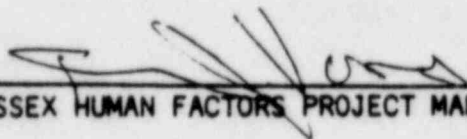
Labels and location aids survey DLCIN R403
TP6.1B3.33

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

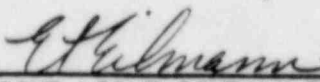
Delay in activation or operation of incorrect controls may result. Delay in observation of correct display, or observation of incorrect display may result.

K) REVIEW AND RECOMMENDATIONS:

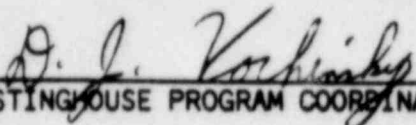
- Functionally grouped controls or display should be identified in accordance with 0700 Paragraph 6.6.3.7a
- Apply hierarchical labeling to identify functionally related groups.



ESSEX HUMAN FACTORS PROJECT MANAGER

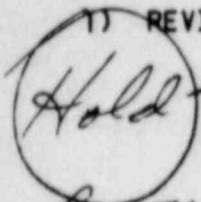


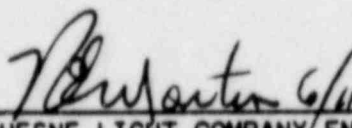
DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER



WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

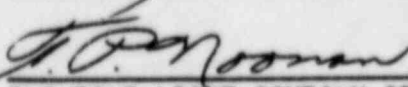
 Hold - Need to identify specific groups or recommended groups before determination can be made



DUQUESNE LIGHT COMPANY ENGINEERING MANAGER



DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER



DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS / 2
PLANT/UNIT

b) ORIGINATOR: J. Downing c) HED NO.: 2***-1107

d) REVIEWED BY: W. J. Catullo
(Westinghouse) e) DATE: 8/3/84

[Signature]
(Essex)

f) HED TITLE: Lines of demarcation not included
to enclose functionally related displays

g) ITEMS INVOLVED:
All benchboards and vertical panels

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:
No lines of demarcation which should be used
to enclose functionally related displays.
6.6.6.2 a (1)


i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:
DLCIN 12423
Labels and Location Aids Survey
• TP6.1 B3.50

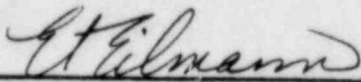
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:
Delay in observation of correct display or observation
of incorrect display may result.

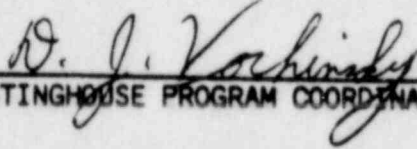
k) REVIEW AND RECOMMENDATIONS:

Lines of demarcation should be used to enclose functionally related displays in accordance with 0700 Paragraph 66.6.22 (1)

OK


ESSEX HUMAN FACTORS PROJECT MANAGER

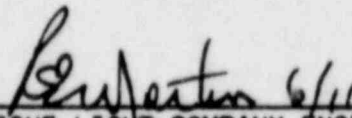

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

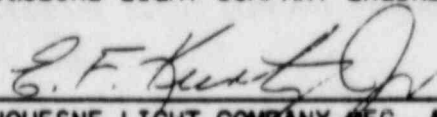

WESTINGHOUSE PROGRAM COORDINATOR

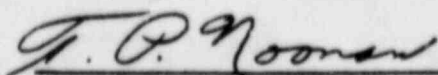
l) REVIEW AND DISPOSITION:

Approve

Recommend demarcation follow the guidance of existing BU-11,


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS / 2
PLANT/UNIT

b) ORIGINATOR: J. Downing c) HED NO.: 2XXX-1108

d) REVIEWED BY: W.J. Catullo Jr e) DATE: 7/3/84
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: Lines of demarcation not included
to enclose functionally related controls

g) ITEMS INVOLVED:
all benchboards and vertical panels

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:
No lines of demarcation which should be used
to enclose functionally related controls
0700 Paragraph 6.6.6.2a(2)

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

DLCIN R403

Labels and Location Aids Survey

TP6.183.51

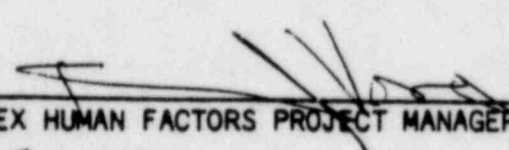
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

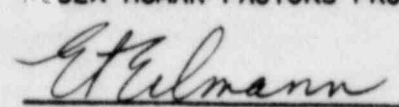
Delay in activation of correct control or operation
of incorrect control may result.

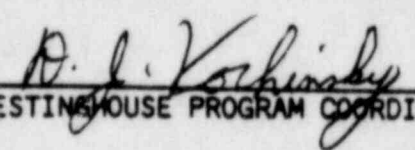
k) REVIEW AND RECOMMENDATIONS:

Lines of demarcation should
be used to ensure functionally related controls
in accordance with 6.6.6.2a(2)


ok :

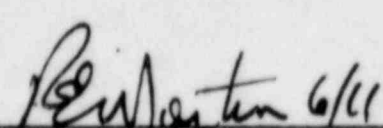

ESSEX HUMAN FACTORS PROJECT MANAGER

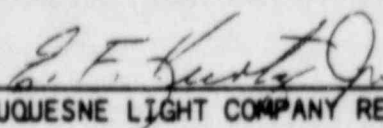

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

 Recommend that demarcation follow guidance
of existing BO-1.


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) BVPS - 2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2XXX-1116

d) REVIEWED BY: D. J. Kitchin e) DATE: 3/28/85
(Westinghouse)

I. Voss
(Essex)

f) HED TITLE: Location aids not available

g) ITEMS INVOLVED: Controls that receive SI signals
~~are~~ are necessary for SLI.

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.6.6.1

The operators performance could be enhanced through the use of location aids such as color coding.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Validation of Control Room Functions (R40)

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Delay of operator response due to
increased search time

k) REVIEW AND RECOMMENDATIONS:

Enhance SLI controls with Yellow

Enhance SI controls with Red

Enhance Feedwater Isolation with Green

"

CIA

"

Orange


"

CIB


"

Blue

Suggest making colors consistent with Unit-1 (i.e., as above)


ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Agree to color coded plastic tags

For each engineered safeguards feature activation signal all the components (pumps, valves, etc.) that the signal effects will have a color-coded placard around the status indicating light. This will aid the operator in determining which condition the component should be in ^{for a given condition} (i.e. Stop, Start, open, closed).

See ^{DLC} letters:

ND2552:0748

ZNCD-03162


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) BVPS - 2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2***-1201 F

d) REVIEWED BY: D. J. Vachinsky e) DATE: 2/19/85
(Westinghouse)

CR Nos. 80, 81, 82, 83

[Signature]
(Essex)

f) HED TITLE: Arrangement of controls or displays
are not logical

g) ITEMS INVOLVED: See Attached

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.8.2.2

Components are not arranged in a logical, left-to-right or top to bottom sequence. They are not arranged to coincide w/ operators expectations.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Validation of Control Room Functions (R-406)


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Operator's response may be incorrect or delayed.

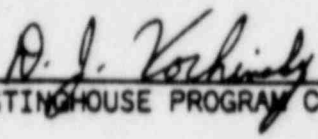
k) REVIEW AND RECOMMENDATIONS:

See attached sheets
for each individual recommendation.

Arrangement should take into consideration the arrangement of corresponding controls in Unit 1. For g) on attached sheets, the arrangement of these controls on the ESP is correct. MCBs should match the ESP arrangement.


ESSEX HUMAN FACTORS PROJECT MANAGER

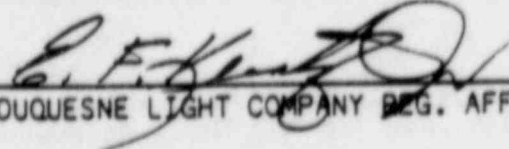

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

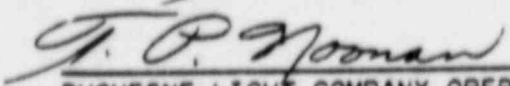

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

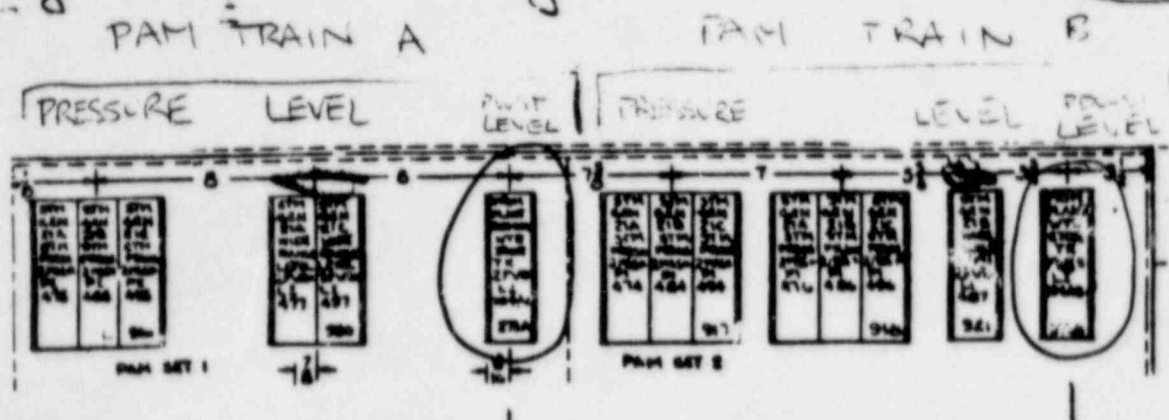
ITEM F LEAVE AS IS; panel is symmetrical for PSM.
all other changes approved

DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 7-25-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

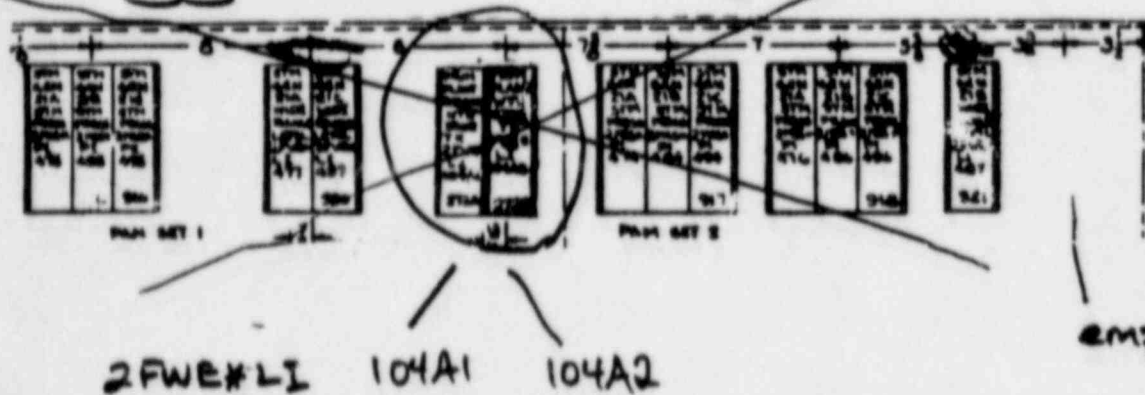
F. Existing PDWST arrangement



Hierarchical labeling should act as a location aid to reduce operator search time.

7/29/85
RT

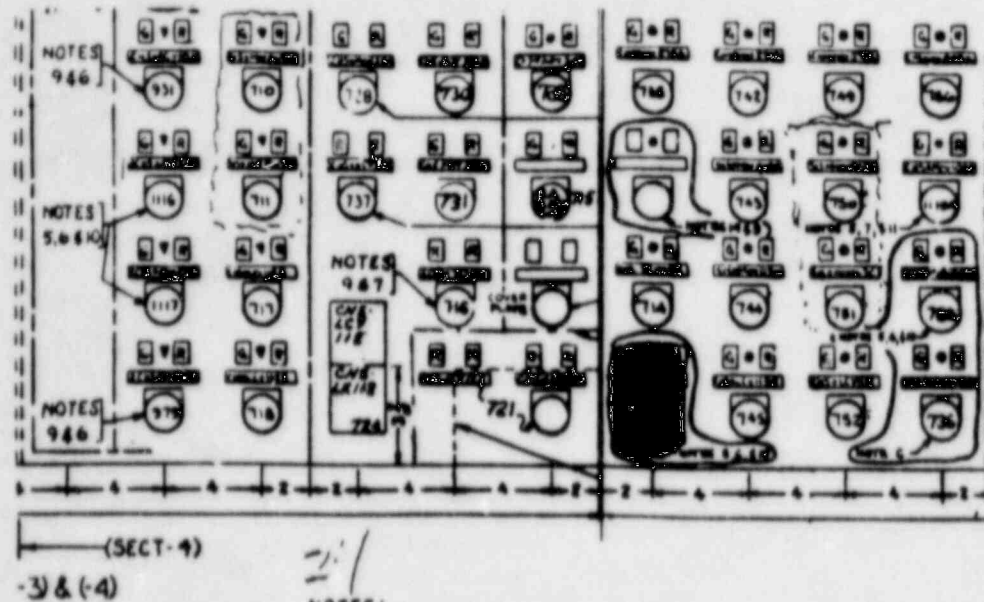
Suggested arrangement



Indicators are separated to satisfy separation criteria (grouped by train). Some type of surface enhancement (e.g. labeling, color-coding) will assist operator. Indicators are separated by PAM Sets, the PAM Sets (2) will be demarcated in some way to further assist operator.

Existing } Cold leg Injection Isolation valves
 e. Arrangement } [2 SIS X MOV 867 A, B, C, D

CR No. 81



710 = B

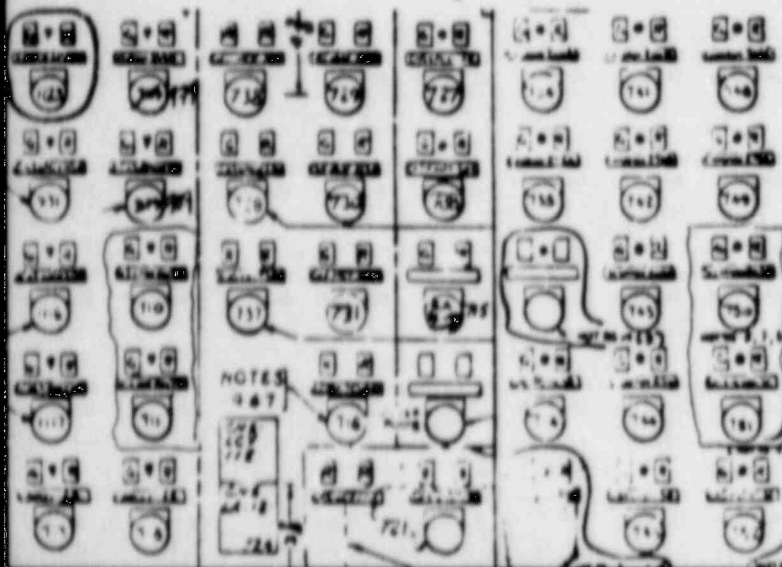
711 = D

750 = A

751 = C

- ✓ Non symmetrical arrangement
- ✓ B/D on left A/C on right

Suggestion: At a minimum, place
 #s 750 + 751 in locations which
 correspond by row to #s 710 + 711.



RT recommends using the
 new arrangement at left.
 This would also solve HED #
 2***-1201 D.

See 2***-1201 D.

a) BVPS - 2
PLANT/UNIT

b) ORIGINATOR: M. Francher

c) HED NO.: 2ABX0201

d) REVIEWED BY:

D. J. Kochinsky
(Westinghouse)

e) DATE: 6/5/85

[Signature]
(Essex)

f) HED TITLE: No location has been designated for
the installation of communication equipment
~~in~~ ASP room.

g) ITEMS INVOLVED: Alternate Shutdown Panel

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

No location has been designated for the installation of communication equipment needed for bringing the plant to a safe shutdown condition. 6.1.1.1 (a)

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

CR Survey

9.2
TP 1.3 ^{9.2} ~~1.3~~ ^{TP}

(R401B)

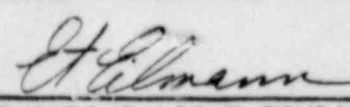
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

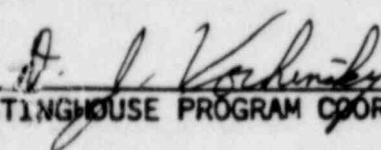
Supervisor/Operator will not be able to communicate outside of ASP area.

K) REVIEW AND RECOMMENDATIONS: Ensure that a location is designated for the appropriate communication equipment. The location should be one easily access by the supervisor.

As suggested above.


ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR


1) REVIEW AND DISPOSITION:

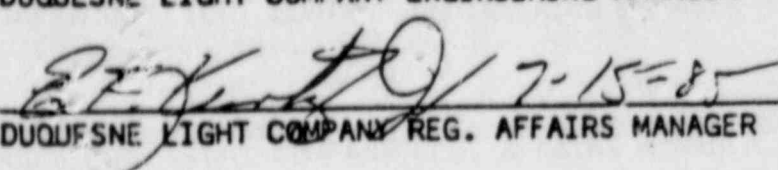
SEE ATTACHMENT:

~~ITEMS 1, 2, STEAM SUPPLY VALVES & FW FLOW INDICATION ARE ADEQUATE TO PROVE PUMP OPERATION~~

~~3, PROCEDURES ARE BEING REVISED TO REFERENCE USE OF TH & TC~~

~~4 & 5, INSTALLATION OF CLOCK OR COMPUTER TIME INDICATION WILL PROVIDE SUFFICIENT INDICATION OF COOLDOWN RATE~~

 10-1-85
DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 7-15-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

Reject
Already
Incorporated
in design

CLARIFICATIONS TO HED NO. 2AB#0201

A LOCATION HAS BEEN DESIGNATED FOR THE INSTALLATION OF COMMUNICATION EQUIPMENT IN THE ASP ROOM. SWEC DRAWING NO. 12241-RE-80L-9B (DATED 12-4-84) SHOWS A COMBINATION WALL HANDSET/SPEAKER AMPLIFIER IS DESIGNED TO BE INSTALLED IN THE ASP ROOM ON THE WALL NEAR THE DOOR TO THE ASP ROOM. A LOUDSPEAKER IS ALSO SHOWN IN THE ASP ROOM.

THE MAXIMUM DISTANCE THE WALL/HANDSET SPEAKER AMPLIFIER COULD POSSIBLY BE LOCATED FROM THE FRONT OF THE ASP IS APPROXIMATELY 8 FEET (IF LOCATED NEAR THE DOOR). SWEC WILL BE INSTRUCTED BY COPY OF THIS HED TO ~~RELOCATE~~ LOCATE HANDSET CLOSE ENOUGH TO THE ASP SO AN OPERATOR CAN USE PHONE AND OPERATE CONTROLS ON THE ASP. IF NECESSARY INSTALL AN EXTRA LONG CORD ON HANDSET.

NO HED ACTUALLY EXISTS SINCE ~~GOVERNMENT~~ COMMUNICATION EQUIPMENT WAS INCORPORATED INTO THE DESIGN.

D. Jones 9-16-85

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: P. CATER (DLC-OPS)

c) HED NO.: 2BC3-3025

d) REVIEWED BY: A. J. Kachinsky
(Westinghouse)

e) DATE: 2/27/85

CR No. 74

[Signature]
(Essex)

f) HED TITLE: STATION AIR COMPRESSOR REMOTE
CONTROL SWITCHES INTERFERE W/ EACH OTHER

g) ITEMS INVOLVED: SAS-P-21A
SAS-P-21B

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.4.1.1
see j) CONTROLS MOUNTED TOO CLOSE


i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER: Reference letter ND2052:0022

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

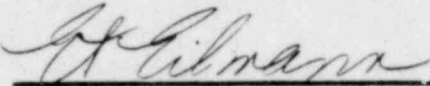
WHEN SAS-P-21A IS IN "PULL TO LOCK" POSITION, SAS-P-21B DOES NOT HAVE ENOUGH CLEARANCE TO GET RED FLAG START POSITION.

k) REVIEW AND RECOMMENDATIONS: INSTALL "T" TYPE CONTROL
HANDLE TO GET ROTATIONAL CLEARANCE.


As recommended above



ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

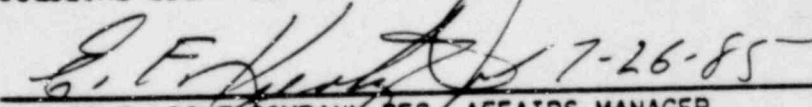


WESTINGHOUSE PROGRAM COORDINATOR

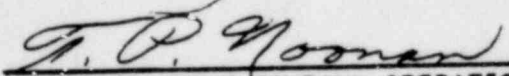
l) REVIEW AND DISPOSITION:

Agree change handled

DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 7-26-85

DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER



DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2ESX-3020

d) REVIEWED BY: A. J. Kochinsky
(Westinghouse) e) DATE: 5/14/85

[Signature]
(Essex)

f) HED TITLE: Controls are located less than 3
inches from the front edge of console

g) ITEMS INVOLVED: 2 SIS * MOV 865 A, B, C
2 CHS * LCV 460 A, B
2 RHS * MOV 702 A, 702A, B
Emergency Generator 2-1 (start).
2-2 (start)

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

Controls are not set back the minimum of 3 inches
from the front edge to protect against accidental
activation. 6.1.2.2 d. (1)

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

C.R. Surveys (R403)


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Possible accidental activation
by operator.

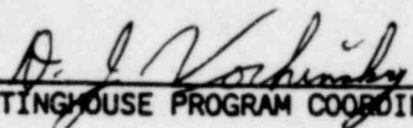
k) REVIEW AND RECOMMENDATIONS:

- 1) relocate these controls
- or 2) provide covers to prevent accidental activation
- or 3) provide a guard rail along the front edge

Plexiglass covers should be provided for ESP controls as in 2) above, especially for times when panel is not in use.

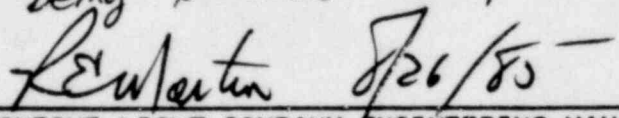

ESSEX HUMAN FACTORS PROJECT MANAGER

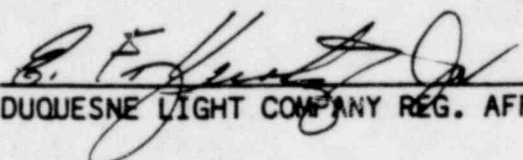

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Change for ESP approved due to ~~inadequacy~~ remoteness of panel. Main control board access is under admin control for access & is manned continuously; therefore only authorized operators have access. (Plexiglas covers for entire benchboard section of ESP are being provided as part of original design). Therefore, the intent of the original design resolves this HED.


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) BVPS-2
PLANT/UNIT

5

b) ORIGINATOR: - M. Francher

c) HED NO.: 2VXX-2007

d) REVIEWED BY: ^{TW}
~~T~~ D. J. Kochinsky
(Westinghouse)

e) DATE: 1/29/85

CR No. 68

~~T~~ [Signature]
(Essex)

f) HED TITLE: setpoints are outside of
the displays range

g) ITEMS INVOLVED:

See Attached list

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.5.1.2 a

Scale units should be consistent with the degree of precision and accuracy needed by the operator

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Verification of task performance
Capabilities, Suitability (R405) 6.2.1.2
Validation (R406)

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

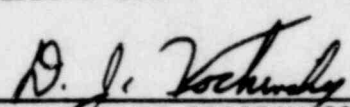
Operator can not receive desired
setpoint information

k) REVIEW AND RECOMMENDATIONS:

Scales should be modified to provide the appropriate range (see attached)


ESSEX HUMAN FACTORS PROJECT MANAGER

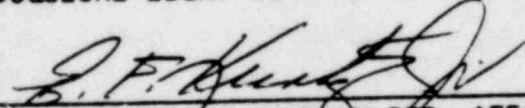

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

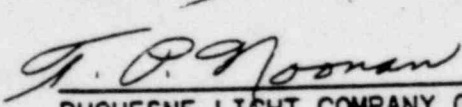

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Agree. top end of scale ~~to~~ must consider values from setpoint study. including 2QPS-LI-102 A & B. (need to cover T.S. required ranges).

DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 7-15-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

Setpoints are outside c + the
displays range.

Items involved

2 QSS - LR 100 RWST level

present scale = 0 - 700 inches, needed values are 729 - 737 inches

2 FNC - LI 102A, 102B Spent fuel pool level

present scale = 0 - 200 inches, needed value is 298 inches

2 RSS - LR 151

Cont Sump level

2 RSS - LI 151A, 151B

Cont Sump level

present scale = 0 - 120 inches

needed values are 203 inches, 140 inches

NOTE: "needed values" are those provided by
the setpoint study

a) EVPS-2
PLANT/UNIT

9

b) ORIGINATOR: M. Francher c) HED NO.: 2VCE-2214d) REVIEWED BY: D. L. Korchinsky e) DATE: 1/21/55
(Westinghouse)

CR No. 65

f) HED TITLE: Expanded scale range is not
needed.
(Essex)g) ITEMS INVOLVED: Condensate Turbine Discharge Pressure.
2CNM PI 101

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

Scale units are not consistent with
the degree of precision needed by the operator
G.5.1.2 a.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:


Verification of task performance capabilities;
Suitability (R405) G.2.1.2

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

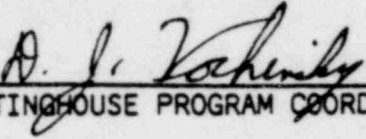
Operators response may be delayed

k) REVIEW AND RECOMMENDATIONS:

0-20 psig $\times 10^2$. Since shut-off criteria is design
CR's felt that the scale should be changed to
0-1000 ^{torr} and the multiplier ~~5~~ ¹ be removed.


ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

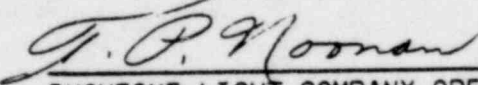

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Agree with HED Recommendation

DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

E

EQUIPMENT CHANGE REQUIRED

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS - 2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2***-1201 A

d) REVIEWED BY: D. J. Vordunsky e) DATE: 2/19/85
(Westinghouse)

CR Nos. 80, 81, 82, 83

[Signature]
(Essex)

f) HED TITLE: Arrangement of controls or displays
are not logical

g) ITEMS INVOLVED: See Attached

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.8.2.2

Components are not arranged in a logical, left-to-right or top to bottom sequence. They are not arranged to coincide w/ operators expectations.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Validation of Control Room Functions (R-406)


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:


Operator's response may be incorrect or delayed.

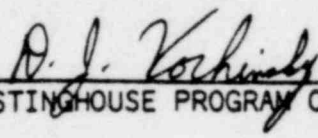
k) REVIEW AND RECOMMENDATIONS:

See attached sheets
for each individual recommendation.

Arrangement should take into consideration the
arrangement of corresponding controls in Unit 1.
For g) on attached sheets, the arrangement of these
controls on the ESP is correct. MCBs should match
the ESP arrangement.


ESSEX HUMAN FACTORS PROJECT MANAGER

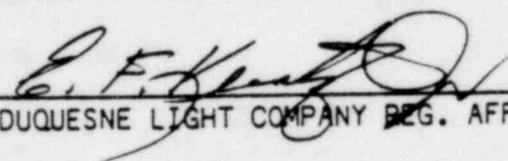

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

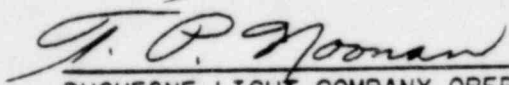

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

ITEM ¹²⁰¹ A F LEAVE AS IS; panel is symmetrical for PAM.
all other changes approved

DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 7-25-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

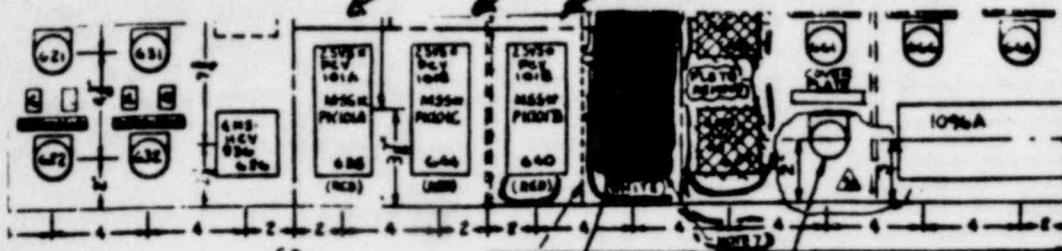
q. Location: BA2, BA3

HED NO.: 2***-1201
A

CR No 83

Existing } Atmospheric Steam Dump Valve Controllers
Arrangement }

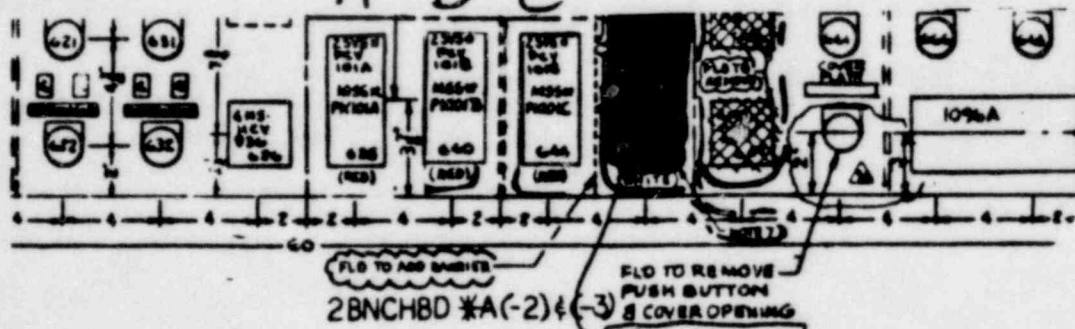
2HSS*PK101 A, C, B



Suggested
Arrangement

2HSS*PK101

A B C



RT suggests rearranging controllers as listed above

a) BVPS - 2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2***-1201B

d) REVIEWED BY: D. J. Vandenby e) DATE: 2/19/85
(Westinghouse)

CR Nos. 80, 81, 82, 83

[Signature]
(Essex)

f) HED TITLE: Arrangement of controls or displays
are not logical

g) ITEMS INVOLVED: See Attached

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.8.2.2

Components are not arranged in a logical, left-to-right or top to bottom sequence. They are not arranged to coincide w/ operators expectations.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Validation of Control Room Functions (R-406)

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Operator's response may be incorrect or delayed.

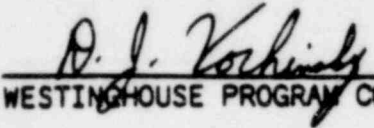
k) REVIEW AND RECOMMENDATIONS:

See attached sheets
for each individual recommendation.

Arrangement should take into consideration the arrangement of corresponding controls in Unit 1. For g) on attached sheets, the arrangement of these controls on the ESP is correct. MCBs should match the ESP arrangement.


ESSEX HUMAN FACTORS PROJECT MANAGER

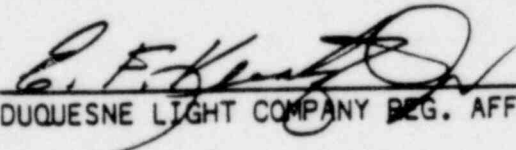

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

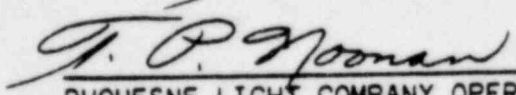

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

ITEM F LEAVE AS IS; panel is symmetrical for PSM.
all other changes approved


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 7-25-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER

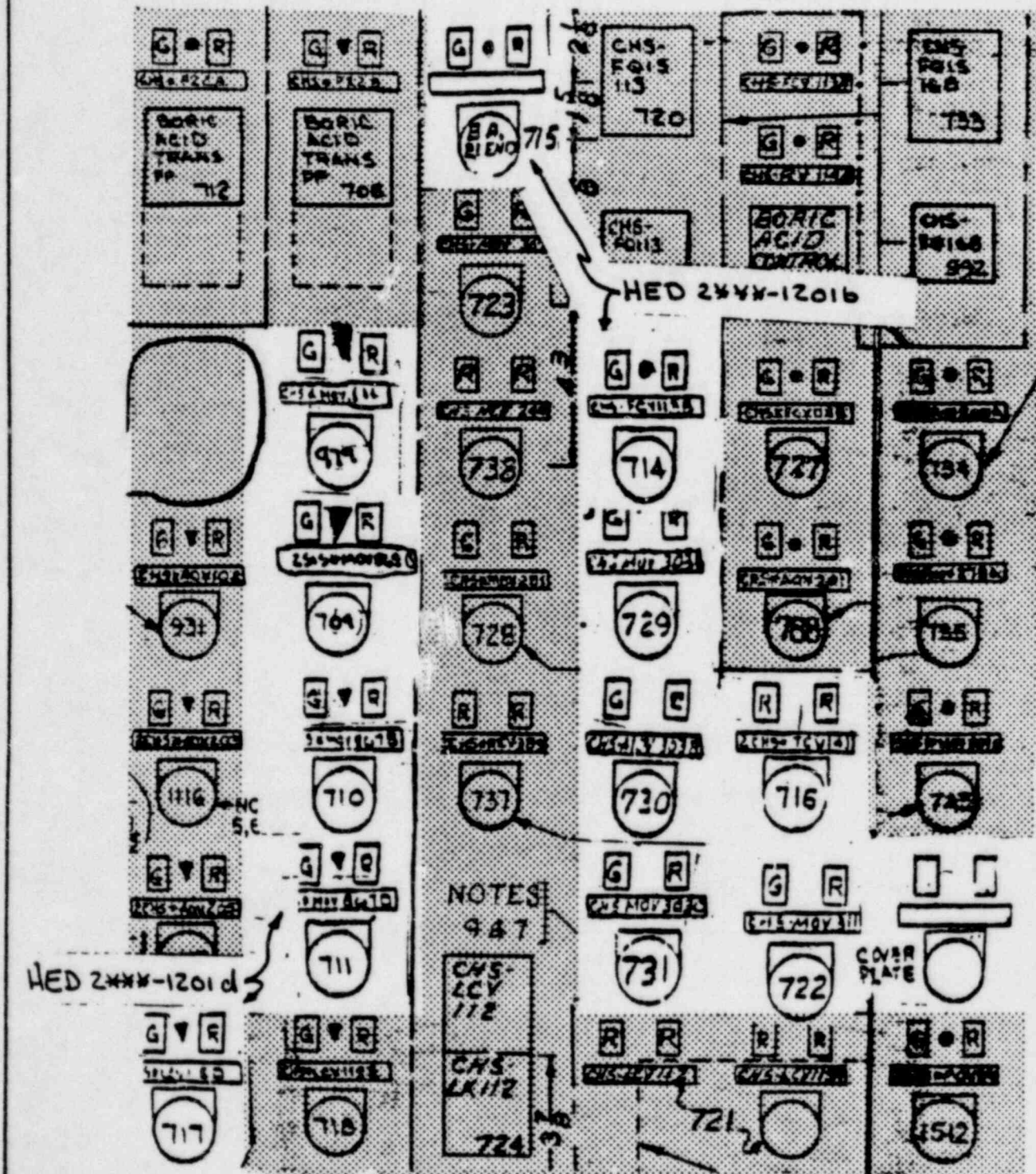

DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

2*** 1201 (b) 1 d

Recommended Arrangement

REFER TO RE-25J AND K

PAGE _____



			TITLE FIGURE 3-1 RECOMMENDED REARRANGEMENT OF SWITCHES					CLIENT	
	BY	DATE						PROJECT	
PREPARED								J.O. NO.	
CHECKED								① ISSUED BY	
APPROVED								DATE	
REVISIONS BY		②	③	④	⑤	⑥	NUMBER		
DATE									

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS - 2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2***-1201D

d) REVIEWED BY: D. J. Voshinsky e) DATE: 2/19/85
(Westinghouse)

CR Nos. 80, 81, 82, 83

[Signature]
(Essex)

f) HED TITLE: Arrangement of controls or displays
are not logical

g) ITEMS INVOLVED: See Attached

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.8.2.2

Components are not arranged in a logical, left-to-right or top to bottom sequence. They are not arranged to coincide w/operators expectations.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Validation of Control Room Functions (R-406)


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Operator's response may be incorrect or delayed.

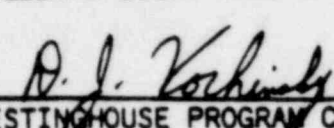
k) REVIEW AND RECOMMENDATIONS:

See attached sheets for each individual recommendation.

Arrangement should take into consideration the arrangement of corresponding controls in Unit 1. For g) on attached sheets, the arrangement of these controls on the ESP is correct. MCBs should match the ESP arrangement.


ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

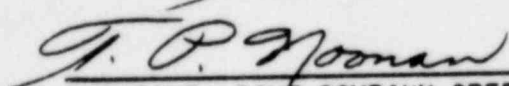

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

ITEM f LEAVE AS IS; panel is symmetrical for PAM.
all other changes approved

DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 7-25-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER

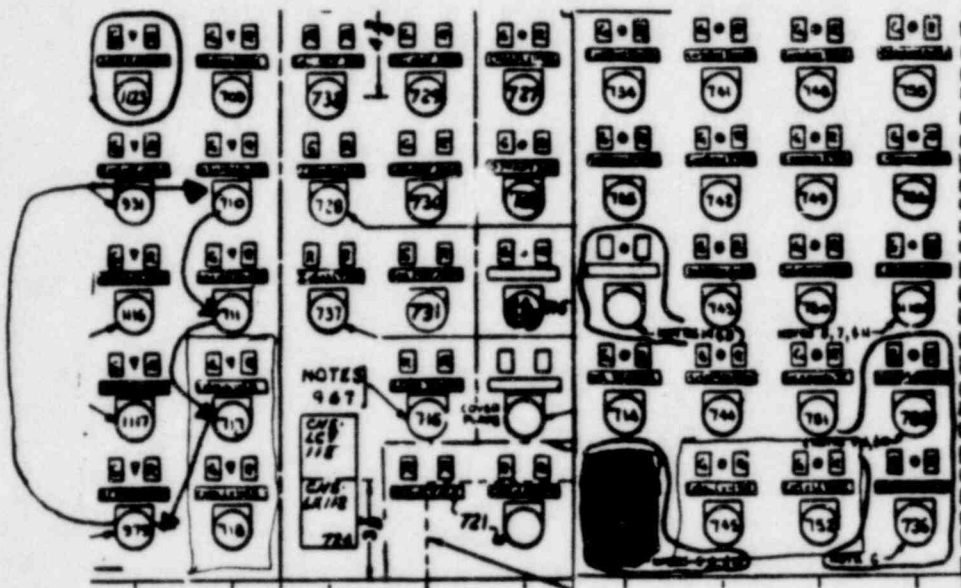

DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

Existing Arrangement

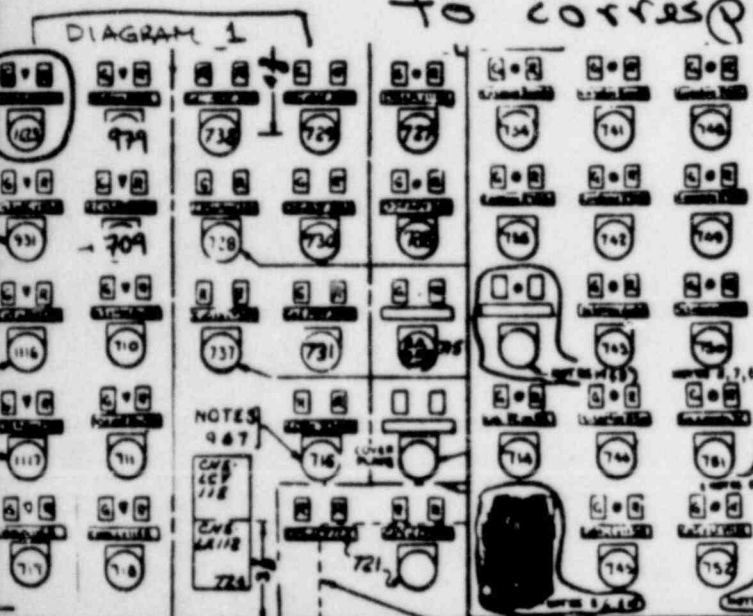
29. Align Charging/HHSI Pump Suction To VCT

- OPEN VCT isolation valves
[2CHS*MOV115C and 115E]
- CLOSE RWST isolation valves
[2CHS*MOV115B and 115D]

Valve#	Label on drawing
115 C =	752
115 E =	718
115 B =	745
115 D =	717



Suggestion! Arrange #s 745+752
to correspond with arrangement of #717&718



RT recommendation: it is suggested that the controls be rearranged as in diagram 1. This involves moving 717 to where 979 is now. moving 979 to where 710 is now. And moving 710 & 711 each down one row in the same column.

a) BVPS - 2
PLANT/UNIT

b) ORIGINATOR: M. Francher

c) HED NO.: 2***-1201 G

d) REVIEWED BY: D. J. Vandenby
(Westinghouse)

e) DATE: 2/19/85

CR Nos. 80, 81, 82, 83

[Signature]
(Essex)

f) HED TITLE: Arrangement of controls or displays
are not logical

g) ITEMS INVOLVED: See Attached

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.8.2.2

Components are not arranged in a logical, left-to-right or top to bottom sequence. They are not arranged to coincide w/ operators expectations.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Validation of Control Room Functions (R-406)

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

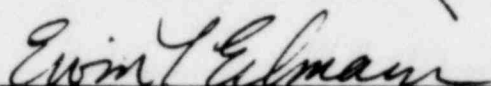
Operator's response may be incorrect or delayed.

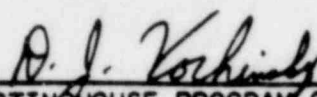
k) REVIEW AND RECOMMENDATIONS:

See attached sheets for each individual recommendation.

Arrangement should take into consideration the arrangement of corresponding controls in Unit 1. For g) on attached sheets, the arrangement of these controls on the ESP is correct. MCBs should match the ESP arrangement.


ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

ITEM F LEAVE AS IS; panel is symmetrical for PSM.
all other changes approved

DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 7-25-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER

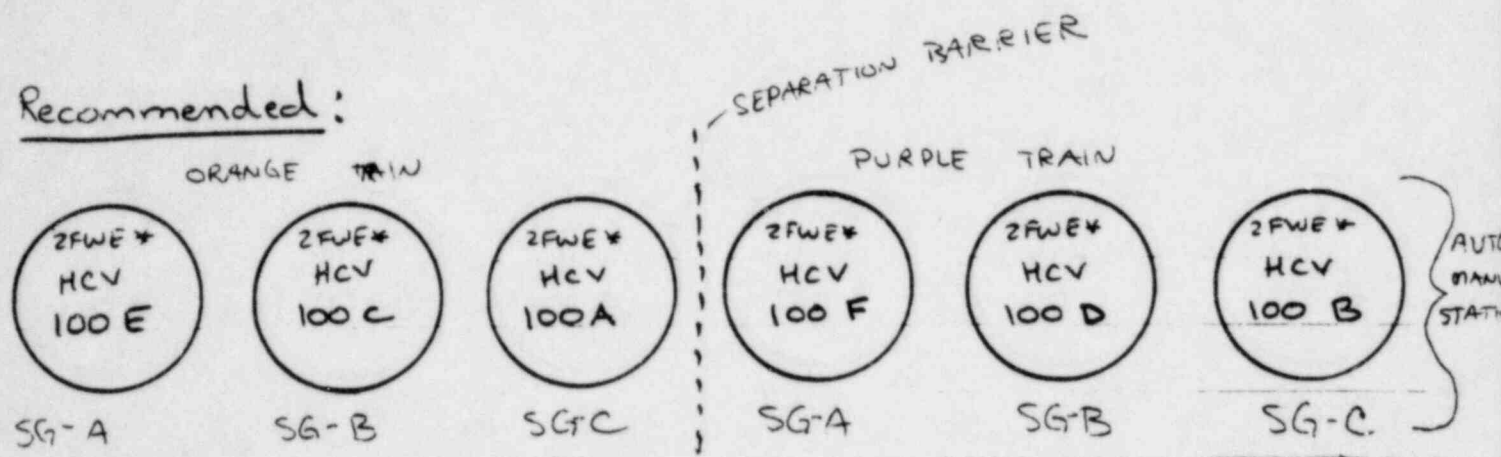

DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HED No. 2***-1201 G

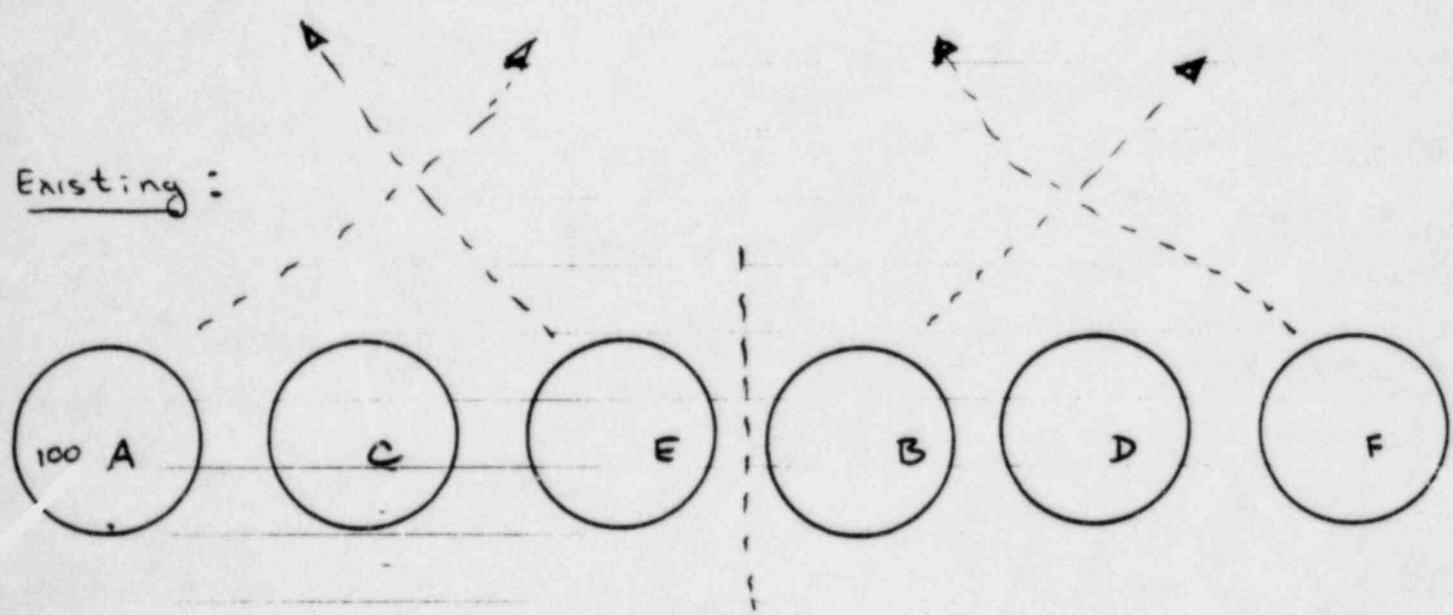
CR No. 82

G. Recommended arrangement for
Aux. Feedwater valve controllers is as shown
below (matches existing ESP arrangement):

Recommended:



Existing:



HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS/2
PLANT/UNIT

7

b) ORIGINATOR: D. J. VOCHINSKY c) HED NO.: 2***-205d) REVIEWED BY: D. J. Vochinsky e) DATE: 1/22/85
(Westinghouse)J. J. Voss
(Essex)f) HED TITLE: MISSING CONTROL ROOM CLOCKg) ITEMS INVOLVED:
CONTROL ROOM CLOCKh) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:
CONTROL ROOM CLOCK DOES NOT EXIST ON THE
MAIN CONTROL BOARD3.7.2.1i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:VERIFICATION OF AVAILABILITY, R405, 6.2.1.1


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

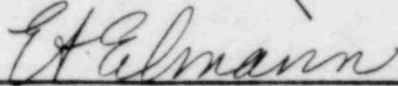
DEVICE DOES NOT EXIST ON THE MAIN CONTROL BOARD TO PROVIDE
INFORMATION NECESSARY TO IMPLEMENT THE FOLLOWING OPERATOR TASKS;ES-1.2, 15; E-1, 21, 22; FR-P.1, 24; ES-1.1, 24; ES-1.2, 21, FR-P.1, 5, 13

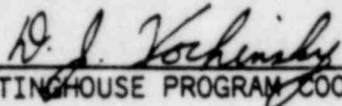
k) REVIEW AND RECOMMENDATIONS:

PROVIDE A TIME OF DAY CLOCK ^{with second hand} ON THE MAIN CONTROL BOARD,

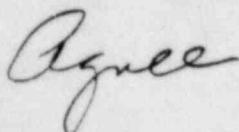
A DIGITAL- CLOCK WOULD BE PREFERRED,

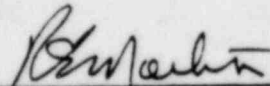

ESSEX HUMAN FACTORS PROJECT MANAGER

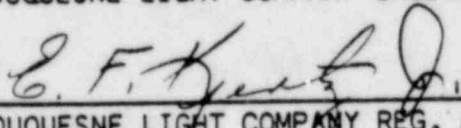

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

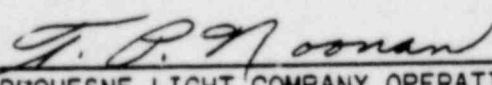

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:




DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2*CX-2217

d) REVIEWED BY: A. J. Vorkind e) DATE: 1/29/85
(Westinghouse)
CR No. 66

[Signature]
(Essex)

f) HED TITLE: Multiscale indicators are used for
measuring AC volts and A.C kilovolts

g) ITEMS INVOLVED: SYNCH VOLTS incoming normal BC3
SYNC VOLTS incoming emergency VCS
:

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.5.1.4 F.

Multiscale indicators should be avoided unless they can be justified as of operational benefit, and precautions are made to avoid operator confusion.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Verification of Task Performance Capabilities;
Suitability (R 405) 6.2.1.2


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Operator's response may be delayed

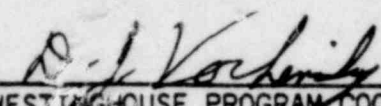
k) REVIEW AND RECOMMENDATIONS:

parameter *...* most commonly used *...*
an operational point of view, should be kept
The other parameter should be taken off the
face of the display

Delete 0-26KV SCALE


ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

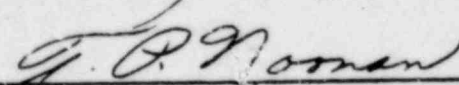

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Incoming & Running Volts should be the same
agree change should be made.

DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 6-21-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2AB*-2017

d) REVIEWED BY: A. J. Voth
(Westinghouse) e) DATE: 5/15/85

[Signature]
(Essex)

f) HED TITLE: Components listed in procedure are
not provided on Alternate Shutdown Panel

g) ITEMS INVOLVED: see list

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 3.8.1 TV
Components are not available on ASP

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

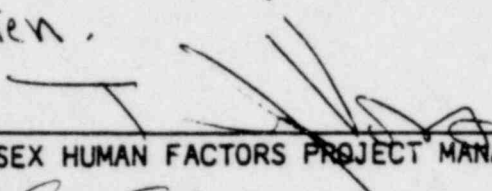
C.R. Surveys (R403) +
Validation of CR Functions (R406)


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

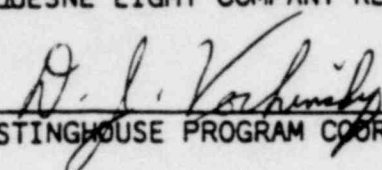
Operator errors due to the
absence of component.

k) REVIEW AND RECOMMENDATIONS: see attached.

Recommend assuming there is a switch or clock available to the operators. Indications are available to ascertain necessary parameters to shut down the plant safely (either on panel or locally in the field). The procedure should be rewritten to reflect specific methods. Procedure walk throughs should be performed when procedure is rewritten.


ESSEX HUMAN FACTORS PROJECT MANAGER

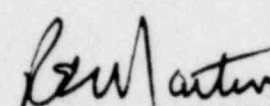

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

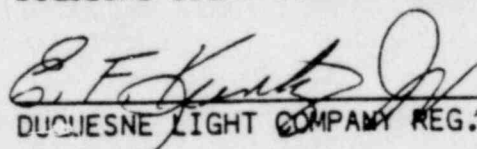

WESTINGHOUSE PROGRAM COORDINATOR

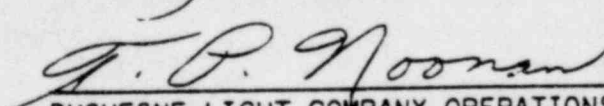
l) REVIEW AND DISPOSITION:

OK for clock & add IR to
ASP assuming wires present.

No cool down rate
meter needed. Run


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 11-14-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

Components listed in procedure are not provided
on Alternate Shutdown Panel

2AB*-2017

NEEDED :
COMPONENT

REVIEW & RECOMMENDATION

Intermediate Range
nuclear power level meter

Provide the A.S.P. with the
necessary equipment.

Clock

Provide the ASP with a clock or
ensure operators wear a watch

Cooldown Rate indication
(100°F/Hr)

Provide the ASP with the necessary equip.

↑
No change
needed JPM

Agree
JPM

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: Jackie Downing c) HED NO.: 2BXX-3403

d) REVIEWED BY: W. P. Catullo Jr. e) DATE: 7/31/84
(Westinghouse)

CR No. 62

T. J. [Signature]
(Essex)

f) HED TITLE: Direction of Movement of Control
does not conform to convention

g) ITEMS INVOLVED:
P.B. Control, Standby Alarm (335) - PNL B32
P.B. Control, Standby Alarm (170) - PNL B33

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:
Directional movement of pushbutton controls
does not follow convention of pull to start
and push to stop - 6.4.2.1a & b

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:
Controls Survey - TP4.1B3.42a & b DLCIN R403
& Validation (R406).

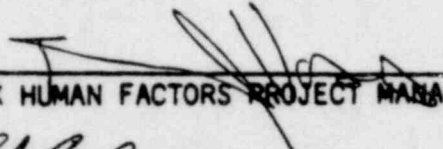
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:
May result in incorrect control movement.
Also, because of control design, control is
more likely to be accidentally activated.

k) REVIEW AND RECOMMENDATIONS:


→ Change control movement to pull to activate and push to stop.

• EXISTING PUSH BUTTONS DEVIATE FROM GUIDELINE AND FROM UNIT 1.

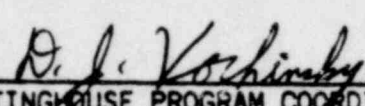
• CHANGE TO RECOMMENDED CONVENTION



ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER



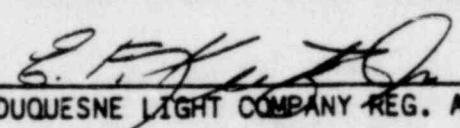
WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

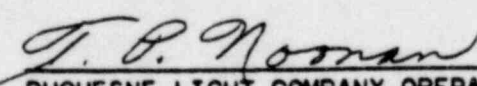
Agree - team should evaluate if label is incorrect or switch is incorrect.
- System should be as BU-1 pull-to-activate

(check elementary)
OK ✓

DUQUESNE LIGHT COMPANY ENGINEERING MANAGER



DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER



DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: M. Francher

c) HED NO.: 2BB2-3301

d) REVIEWED BY: D. J. Vardanyan
(Westinghouse)

e) DATE: 2/19/85

CR No. 69

[Signature]
(Essex)

f) HED TITLE: Rod position controller is inconsistent
with operators expectations

g) ITEMS INVOLVED: Rod position controller

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.4.2.1 (a & b).

The existing control movements (push lever forward to pull rods out, and pull lever to push rods in) does not conform to population stereotypes. Also it is reverse to that of Unit 1.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:


Validation of Control room Functions (R-406)


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Operator may respond incorrectly


k) REVIEW AND RECOMMENDATIONS:

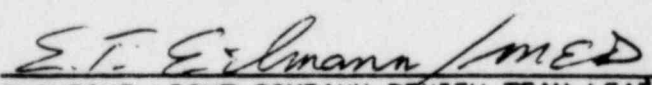
change controller around so it is like Unit 1

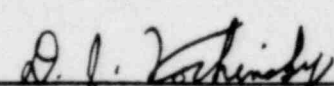
existing: 

change to 

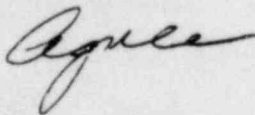
RT recommends make changes as per above


ESSEX HUMAN FACTORS PROJECT MANAGER

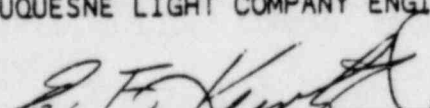

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

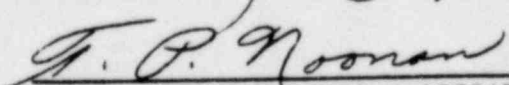

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:



DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 7-15-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2ESX-1001

d) REVIEWED BY: D. J. Vorkhinsky e) DATE: 5/15/85
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: Components listed in procedure are
not provided on E. S. Panel

g) ITEMS INVOLVED: see list

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 3.8.1 Tol
Components are not available on ESP

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:


C.R. Surveys (R403) +
Validation of CR Functions (R406)

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

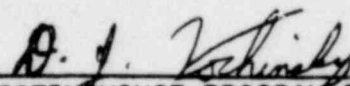
Operator errors due to the
absence of component.

k) REVIEW AND RECOMMENDATIONS: see attached.

Recommend secure watch or clock available to the operator. Indications are to be certain parameters. $T_c + T_H$ can be used to determine T_{avg} , cooldown rate and other means for feedwater control. The procedure should be rewritten to reflect appropriate methods. Procedure walk throughs should be performed when procedure is rewritten.


ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

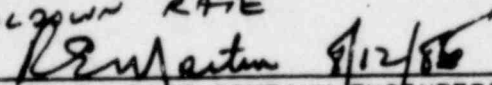
1) REVIEW AND DISPOSITION:


SEE ATTACHMENT:

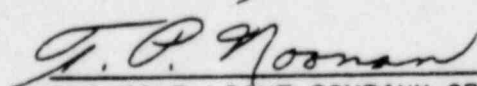
ITEMS 1, 2: STEAM SUPPLY VALVES & FW FLOW INDICATION ARE ADEQUATE TO PROVE PUMP OPERATION.

3: PROCEDURES ARE BEING REVISED TO REFERENCE USE OF T_H & T_c TO DETERMINE T_{avg} .

4 & 5: INSTALLATION OF CLOCK OR COMPUTER TIME INDICATION WILL PROVIDE SUFFICIENT INDICATION OF COOLDOWN RATE


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

Components listed in procedure are not provided
on Emergency Shutdown Panel

2ES*-1001

NEEDED
COMPONENT -

REVIEW & RECOMMENDATION

S.G. Aux F.W. Pump Control
2FWE*P22

Provide the ESP with a S.G. Aux F.W. Pump
2FWE*P22

N/R

Indication of T.D. Aux F.W. pump
(running)

Provide the ESP with the necessary equip.

N/R

Tavg (RCS) (535°F)

Provide the ESP with the necessary equip.

N/R

Emergency Cooldown Rate indication
(100°F/Hr)

Provide the ESP with the necessary equip.

N/R

Clock

Provide ESP with a clock or ensure
operators wear watches.

OK

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS- 2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2ES2-3022

d) REVIEWED BY: D. J. Vorhies e) DATE: 5/15/85
(Westinghouse)

CR No. 72

[Signature]
(Essex)

f) HED TITLE: Control arrangement is not
compatible to operators expectations

g) ITEMS INVOLVED:

Item #	Name Plate
206T	2CHS * LCV 115B
207T	2CHS * SOV 206
208T	2CHS * LCV 115C
209T	2CHS * LCV 115E
210T	2CHS * LCV 115D
211T	2CHS * MOV 330

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.8.2.2 a. b.
Components are not arranged in a continuous alphabetic sequence. Components are not arranged according to operators expectations.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

C.R. Surveys (R403) +

Validation of CR functions (R406)

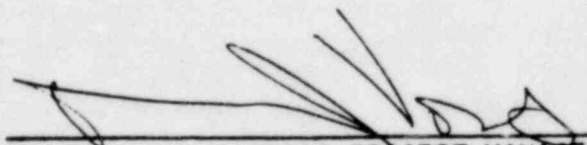
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

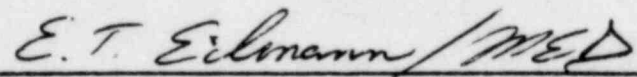
Operator may activate wrong control or may have delay in reacting.

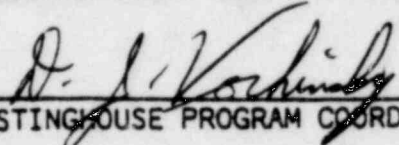
k) REVIEW AND RECOMMENDATIONS:

see attached page

Suggestion would be consistent with (HED) @***-12
(D) regarding MCB in that controls would have
RWST on left + VCT on right, although Tri in
group it would be reversed.


ESSEX HUMAN FACTORS PROJECT MANAGER

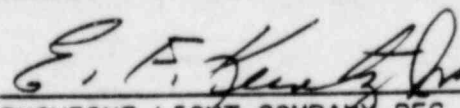

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

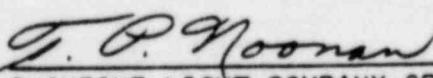

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Agree to implement

DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

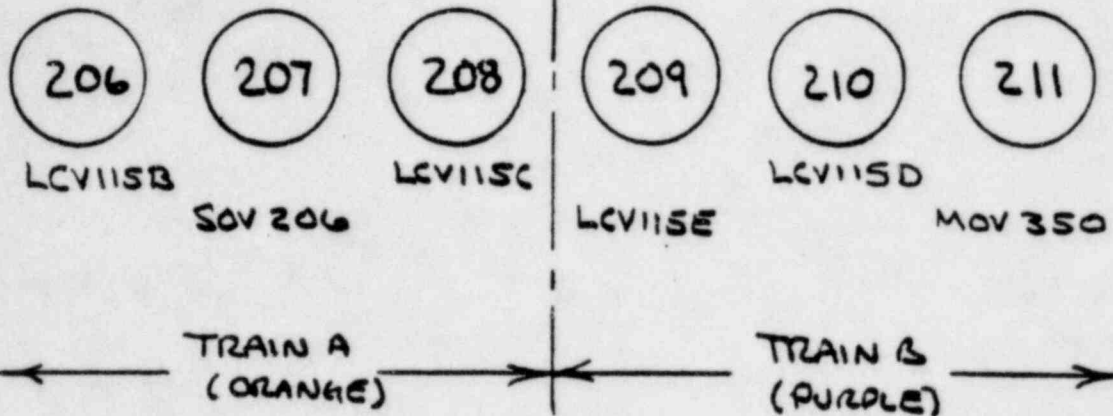
 7-26-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

LEGEND:

ITEM
No.

MARK No.

EXISTING ARRANGEMENTRECOMMENDED ARRANGEMENT

NOTES:

1. All mark numbers preceded by ZCHS*
2. REFER to EMERGENCY SHUTDOWN Panel Section 2
Drawing RE-25DF

		TITLE				CLIENT	
		FIGURE 3-2				PROJECT	
		Recommended Rearrangement of				J.O. NO.	
		Switches				ISSUED BY	
						DATE	
PREPARED	BY	DATE					NUMBER
CHECKED	PEL						
APPROVED							
REVISIONS BY	②	①	③	④	⑤		
DATE							

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2ES4-3023

d) REVIEWED BY: D. J. Vorhies e) DATE: 5/8/85
(Westinghouse)

CR No. 70

[Signature]
(Essex)

f) HED TITLE: Transfer process utilizes two
types of rotary switches

g) ITEMS INVOLVED:

TRANSFER SWITCHES: 2 RHS FK 605B } rotary type
2 RHS HIC 758 B1 } oiltite SW & W. IND. LTS.

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.4.1.1 C.(1)(2)

The type of controls listed are normally anticipated for the adjustment of valves. These controls do not match other controls for the same function.

(oiltite switch used where small J handles are anticipated)

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Control's Survey
TP 4.1B3.6

DLCIN R403

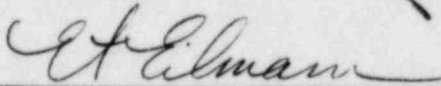
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

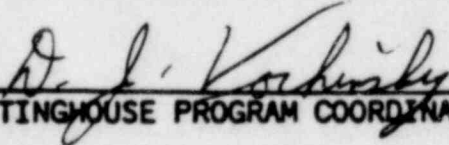
Operator may use wrong control
and/or may have an increase in response time.

k) REVIEW AND RECOMMENDATIONS: replace oiltite switches with transfer oiltite switches to be consistent.

As suggested on 7/2


ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Agree

DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: ²¹⁴2VXX-2014

d) REVIEWED BY: A. J. Krichinsky e) DATE: 5/6/85
(Westinghouse)
CR No. 73

T. H. H. H.
(Essex)

f) HED TITLE: Scales with multipliers are not needed

g) ITEMS INVOLVED:
see attached

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.5.1.2 b.

All displays should indicate values in a form immediately usable by the operator without requiring mental conversion.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Verification of Task Performance Capabilities
- Suitability (R405)

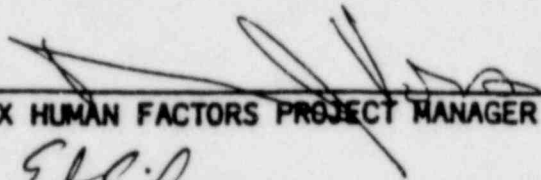
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

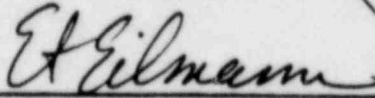
Operators action may be delayed
or incorrect due to mental conversion.

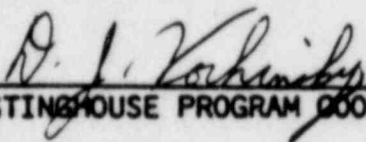
k) REVIEW AND RECOMMENDATIONS:

Ensure that procedures and scales are compatible to eliminate mental conversion. Eliminate the ($\times 10^2$) multipliers (see attached page)

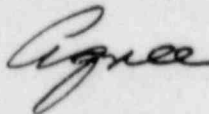
As suggested above.


ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

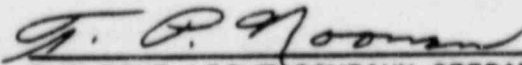

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:



DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

Indicator	scale	Location
Atm Stm Dump SG 21A,B,C 2HSS PI 101A,B,C	0 - 150 x 10 PSIG	VA6
Comp Cool Supply HDR A,B 2CCP FI 117 A1, B1 HIGH RANGE	0 - 700 x 10 GPM	VC5
Comp Cool CLG Supply HDR 2CCP FI 117 A2, B2 LOW RANGE	0 - 20 x 10 ² GPM	VC5
START UP FW Pump Disch Press 2FWS - PI 152	0 - 20 x 10 ² GPM	VC6 -
Stm Gen Feed Manifold 2FWS - PI 155	0 - 20 x 10 ² PSIG	VC6
Stm Gen Stm Press to Aux Feed Pump 2HSS-PI 104A,B,C	0 - 150 x 10 PSIG	VC6
THROT + 1st STAGE 1A, 1B STM PRESS 2HSS - PI 102A, B	0 - 150 x 10 PSIG	VC7
RC Pump - Amps 2RCS - PI 21A,B,C	0 - 120 x 10 Amps	VA9

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO. 2VA6-2010

d) REVIEWED BY: A. J. Kuchinsky e) DATE: 2/19/85
(Westinghouse)

[Signature]
(Essex)

CR No. 64

f) HED TITLE: Expanded scale range is not
needed i.e. scale multiplier is unnecessary.

g) ITEMS INVOLVED: Atmos. Steam dump SG 21A, B, C
2 MSS-PI101 A, B, C

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.5.1.2 a.
Pressure Indicators range from 0-1500 PSIG
Scale (Face) reads 0-150 x 10 PSIG


i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:
Validation of Control room Functions (R406)

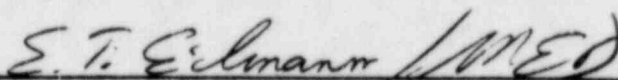
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

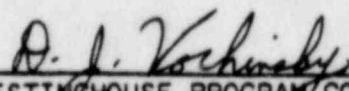
Operators response may be delayed or
may incorrectly read scale.

k) REVIEW AND RECOMMENDATIONS: It is recommended that the existing scale face be changed to 0-1500 psig (~~MF~~ ~~scientific~~ scale multiplier is not needed)


RT recommends as per above.


ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

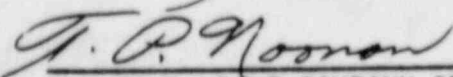

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:



DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 6-21-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS/2
PLANT/UNIT

7

b) ORIGINATOR: D. J. VOCHINSKY c) HED NO.: 2***-3002

d) REVIEWED BY: D. J. Vochinsky e) DATE: 1/22/85
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: MISSING MAIN STEAMLINE ISOLATION MANUAL
INITIATION SWITCH (PUSHBUTTONS)

g) ITEMS INVOLVED:
MAIN STEAMLINE ISOLATION MANUAL INITIATION SWITCH

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:
A MAIN STEAMLINE ISOLATION MANUAL INITIATION SWITCH
DOES NOT EXIST ON THE MAIN CONTROL BOARD

3.7.2.1

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

VERIFICATION OF AVAILABILITY, R405, 6.2.1.1

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:


DEVICE DOES NOT EXIST ON THE MAIN CONTROL BOARD
TO IMPLEMENT THE FOLLOWING OPERATOR TASK: E-0,15

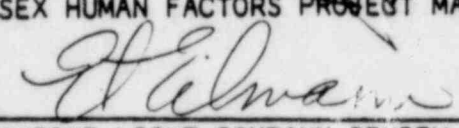
k) REVIEW AND RECOMMENDATIONS:

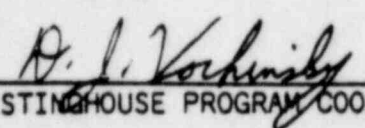
PROVIDE A MAIN STEAMLINE ISOLATION INITIATE SWITCH ON THE MAIN CONTROL BOARD

Active
There are two sets of switches^(pushbuttons) for Main Steamline Isolation initiation, onest for Train A and one set for Train B. Labeling should be added to instruct operator to press both buttons in a given set simultaneously.

CHECK PROCEDURES


ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Panel should be labeled to match
4 STM Isol Pushbuttons


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

CLARIFICATIONS TO HED NO. 2***-3002

SH. 1 OF 4

THE CONTROLS DISCUSSED IN HED NO. 2***-3002 ARE FOUR WESTINGHOUSE OTZ TYPE PUSHBUTTONS IDENTIFIED AS ITEMS 789, 790, 791 AND 792 IN THE "NAMEPLATE ENGRAVING LIST (DATED 11-30-83)" AND DRAWING 12241-RE-25V-6

THE NAMEPLATE LISTS CALLS ITEMS 789 AND 790:

" MAIN STEAMLINE ISOLATION
SYSTEM LEVEL ACTUATION
TRAIN A "

LIKEWISE, ITEMS 791 AND 792 ARE LISTED AS:

" MAIN STEAMLINE ISOLATION
SYSTEM LEVEL ACTUATION
TRAIN B "

THE STATEMENT IN THE "REVIEW AND DISPOSITION" SECTION OF THE HED IS ~~THE~~ VAGUE BUT IMPLIES THE EXISTING NAMEPLATE WORDING IS INCORRECT OR INADEQUATE. THE WORDING LISTED ABOVE, HOWEVER, IS CORRECT AND APPEARS CLEAR. THEREFORE, NO CHANGE IN THE NAMEPLATE WORDING IS RECOMMENDED.

THE "REVIEW AND RECOMMENDATIONS" SECTION OF THE HED RECOMMENDS THAT ~~APPROPRIATE~~ LABELING BE ADDED TO THE BENCHBOARD TO INSTRUCT THE OPERATORS TO PRESS BOTH BUTTONS FOR A GIVEN TRAIN SIMULTANEOUSLY TO INITIATE MAIN STEAMLINE ISOLATION. WORDING TO THIS EFFECT COULD BE ADDED TO THE BOARD. IF OPERATIONS BELIEVES THIS TO BE A WORTHWHILE AID, IN ADDITION TO OPERATOR TRAINING, IT CAN BE ADDED. BESIDES THIS OPERATOR AID OR AS AN ALTERNATIVE TO IT SOME TYPE OF PAINTING OR TAPING OF THE BENCHBOARD SHOULD BE CONSIDERED TO DEMARCATATE THESE

CLARIFICATIONS TO HED NO. Z***-3002

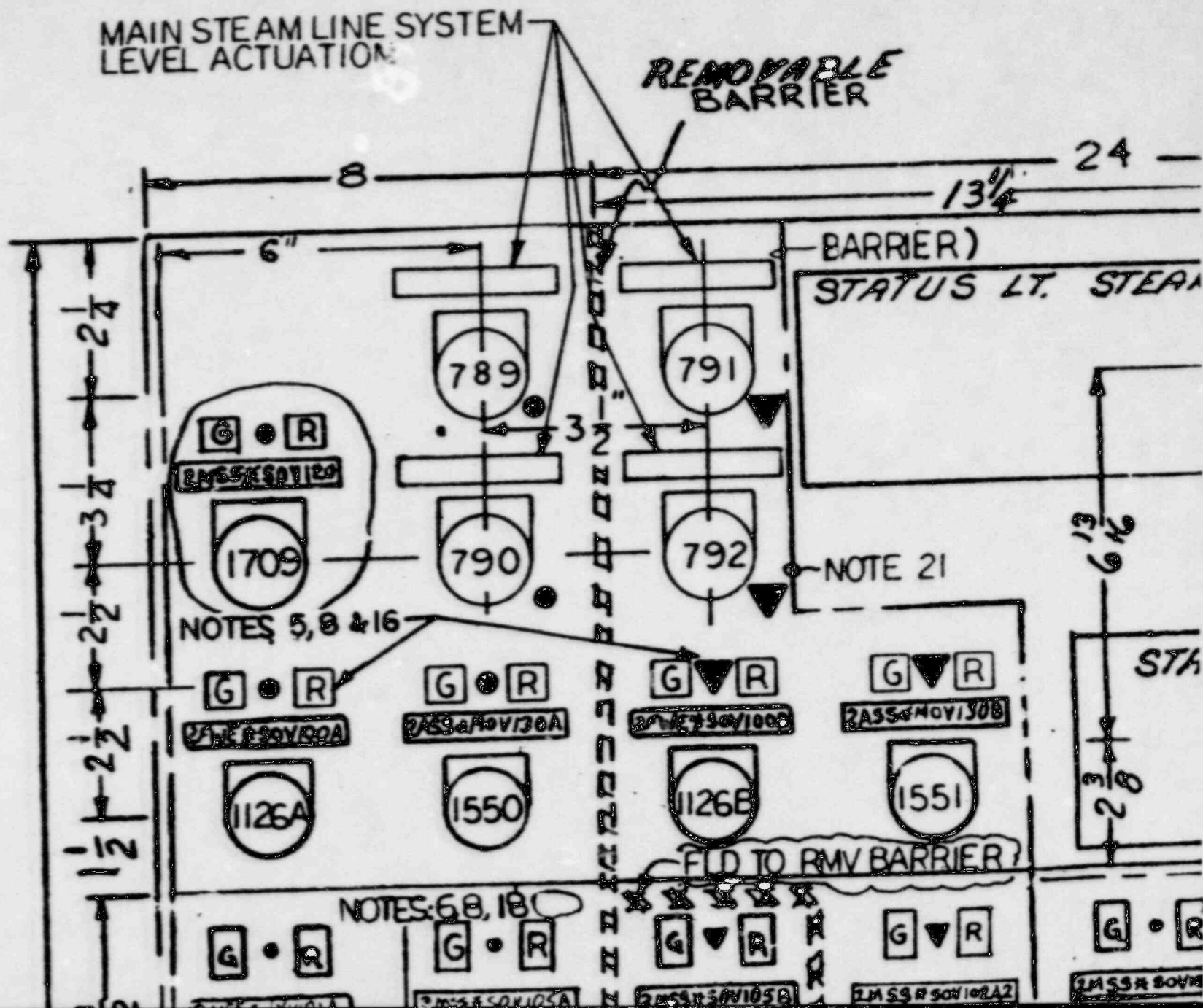
SH. 2 OF 4

CONTROLS. SHEET 3 OF THIS ATTACHMENT SHOWS THE PRESENT ARRANGEMENT OF ITEMS 789, 790 (TRAIN A) AND 791, 792 (TRAIN B). SHEET 4 SHOWS A SUGGESTED DEMARCATING OF THESE CONTROLS USING TAPE TO GROUP THEM AND OFFSET THEM FROM THE REMAINDER OF THE BOARD.

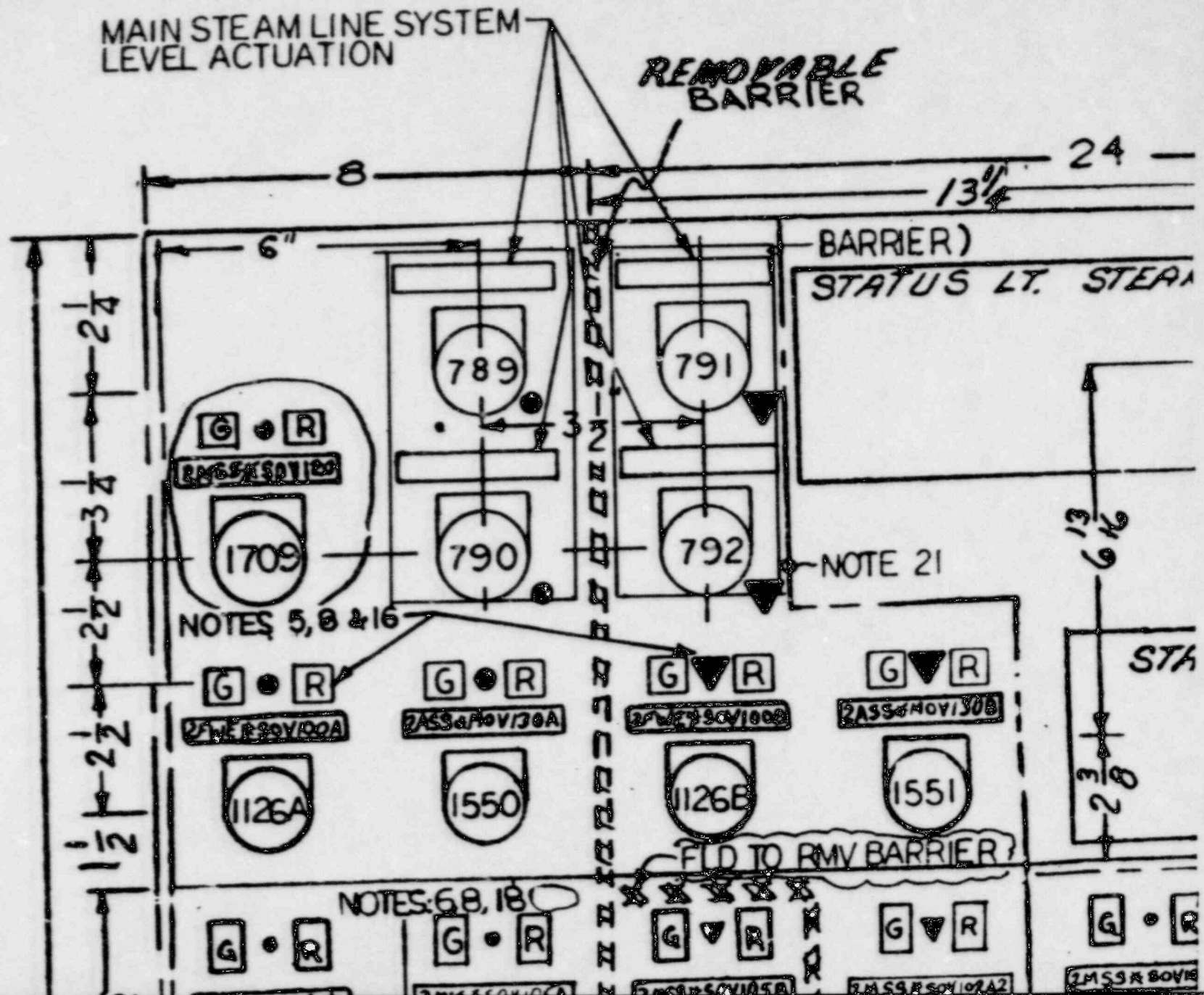
THE CONTROL ROOM REVIEW TEAMS FOR BV-1 AND BV-2 SHOULD ATTEMPT TO MAKE ANY BOARD ENHANCEMENTS FOR THESE CONTROLS AS SIMILAR AS POSSIBLE.

D. Jones 10-23-85

EXISTING ARRANGEMENT OF CONTROLS 789, 790, 791 AND 792
(PART OF HEDRWG. 12241-RE-25V-6)



PROPOSED DEMARCATION LINES FOR ITEMS 789, 790, 791 AND 792



a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: M. Francher

c) HED NO.: 2ABX-1121

d) REVIEWED BY: D. J. Kochinsky
(Westinghouse)

e) DATE: 6/5/85

(Essex)

f) HED TITLE: There is a lack of location aids (hierarchical labeling, demarcation lines, mimic lines, and symbols), on ASP.

g) ITEMS INVOLVED: ASP PANEL

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

Operator Performance can be enhanced through the use of location aids such as demarcation, color and mimics. At present, these are missing from the ASP (6.6.6.1-4)

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

CR Survey TP 6.1 (R403)
Labels + Location Aids

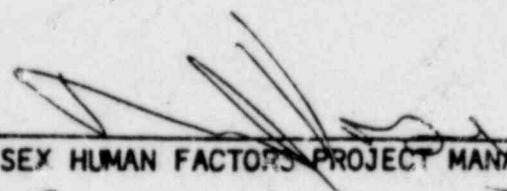
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

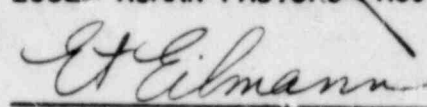
Without proper location aids there is a greater chance of operator error and/or delay in response time.

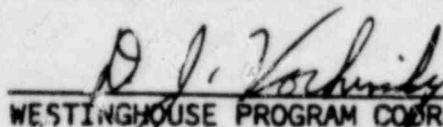
k) REVIEW AND RECOMMENDATIONS:

Apply Permanent labeling and demarcation as recommended in the Stone & Webster HFE Review and in accordance with MCB modifications resulting from the BVPS-2 CRDR.

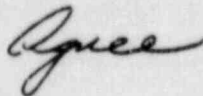
As suggested above.

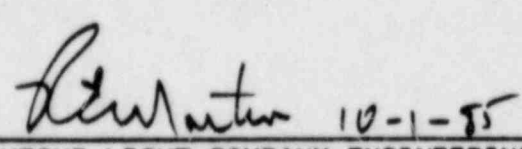

ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:




DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

CLARIFICATIONS TO ZAB#-1121

NOTE THAT THERE HAVE BEEN CHANGES MADE TO THE ASP SINCE THE ISSUANCE OF THE REFERENCED SWEC HFE REVIEW OF THE ASP. (i.e. "ALTERNATE SHUTDOWN PANEL HUMAN FACTORS ENGINEERING REVIEW" DATED 2-28-83). THESE CHANGES INCLUDE THE ADDITION, DELETION OR RELOCATION OF CERTAIN DEVICES ON THE ASP.

THE PROPOSED LABELLING AND DEMARCATION CONTAINED IN THE SWEC HFE REVIEW CAN STILL BE USED AS A GUIDELINE FOR ASP ENHANCEMENT.

A. Sykes 9-17-85

a) BVPS-2
PLANT/UNIT

8

b) ORIGINATOR: M. Franches c) HED NO.: 2VCG-2008d) REVIEWED BY: A. J. Kuchinsky e) DATE: 1/29/85
(Westinghouse)T.J. Voss / MED
(Essex)f) HED TITLE: Meters are not arranged in
a logical order.g) ITEMS INVOLVED: Steam Generator 21A, 21B, 21C
Wide range level
2 FWS LI 477, 487, 497h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.8.2.2

The arrangement of displays is not logical.
They should be arranged in alphabetic sequence

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Verification of task performance capabilities; suitability (R-405) 6.2.1.2
& Validation (R406).

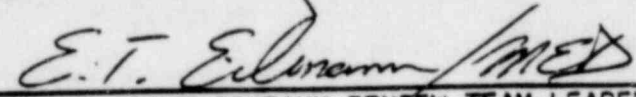
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

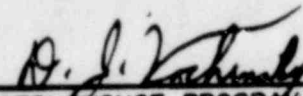
Operators response may be delayed due
to increased search time for display

k) REVIEW AND RECOMMENDATIONS:

~~It is suggested that LI 487 be placed
between LI 477 and 497, if possible. Actual and
suggested drawings are attached.
Above recommendation will violate ^{separation}_{train}
criteria, which groups P.A.M. Indicator Sets by train.
Improved labeling will help.~~

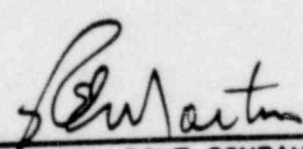

ESSEX HUMAN FACTORS PROJECT MANAGER

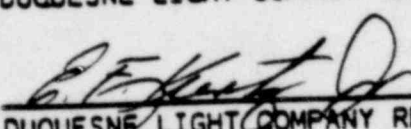

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

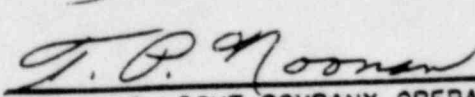

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

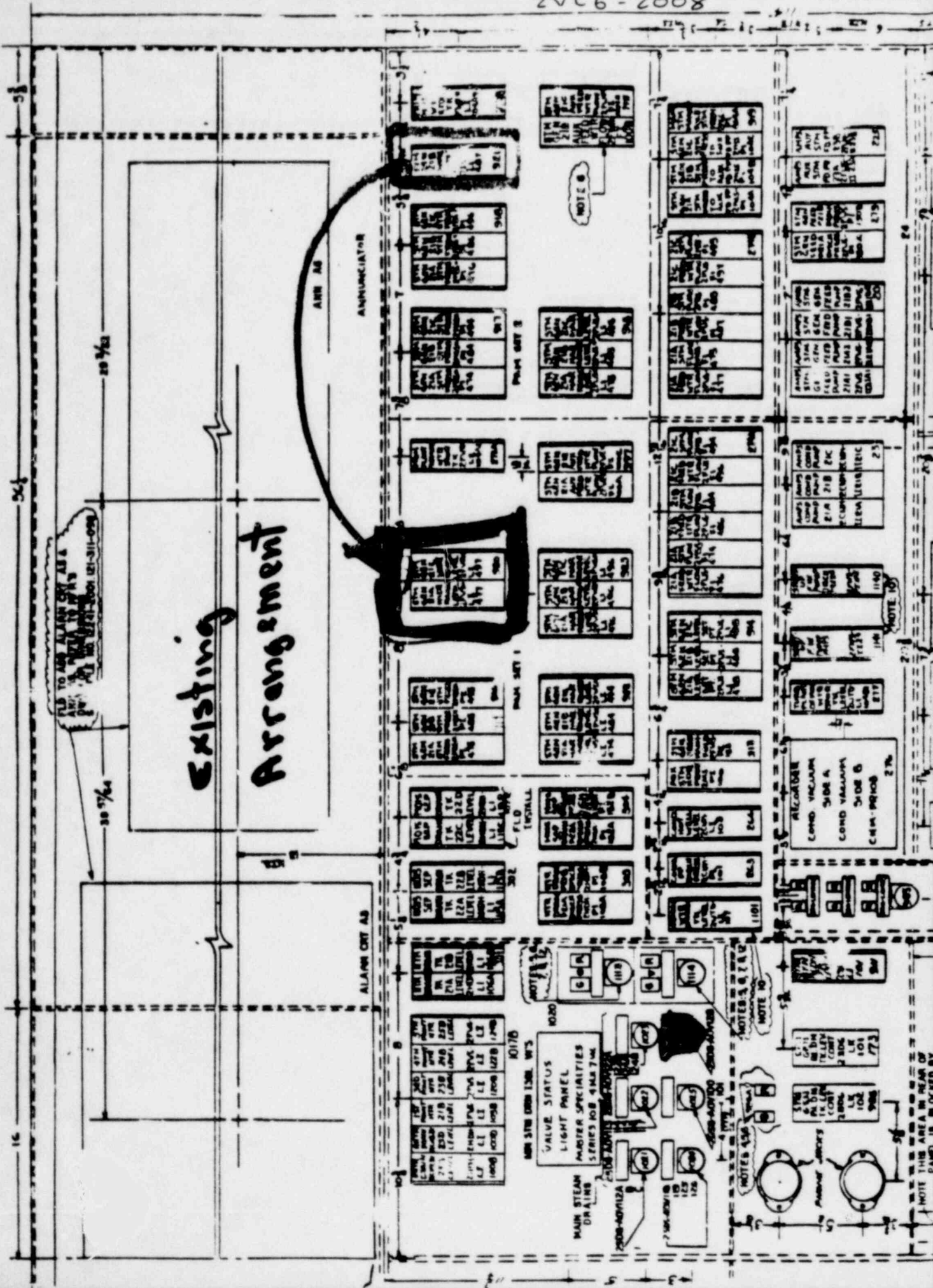
*Agree improve labeling only.
do not move meters*

 10-1-85
DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 7-25-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER





a) BVPS-2
PLANT/UNIT

5

b) ORIGINATOR: M. Francher c) HED NO.: 2***-2213d) REVIEWED BY: G. J. Vochinsky e) DATE: 1/29/85
(Westinghouse)T
(Essex)f) HED TITLE: Setpoints are too precisely defined
to actually be read on scaleg) ITEMS INVOLVED:
see attachedh) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.5.1.2 a

Scale selection - Scale Units are not consistent with the degree of precision and accuracy needed by the operator.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Verification of Task Performance Capabilities, Suitability (R405) 6.2.1.2
& Validation (R406)

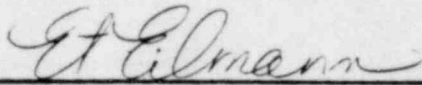
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

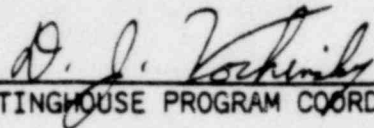
Operator's response may be delayed.

k) REVIEW AND RECOMMENDATIONS:

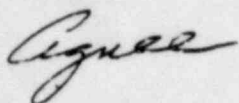
The scale actually seems
adequate. ^{Determine} If the set points ^{in procedures} could ^{be} changed
to the next conservative number that
is readable on the scale (display).
Mark setpoints and normal ranges on indicator scales
so operator can determine potential problems at a glance.

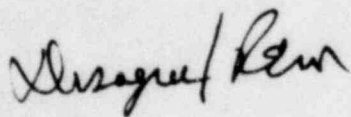

ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

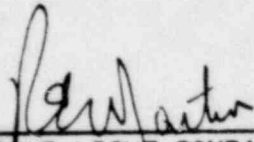

WESTINGHOUSE PROGRAM COORDINATOR


1) REVIEW AND DISPOSITION:

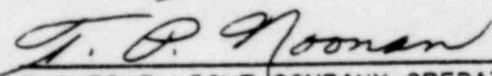




See Sze's comments

 11-12-85
DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 7-15-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

temp are too far away from
to actually be read on existing scale

22222213

RCS - PI 444, 454 ^{MF} graduations of 10 \therefore finest reading = 5 psi
Pressurizer Pressure setpoint is for 1973 psig

RCS - PI 402, 403 graduations of 50 \therefore finest reading = 25 psi
RCS Pressure readings needed for 1736, 2020, 320, 624, 435 psi

RCS - LI 460, 461 2% \therefore 1%
Pressurizer Level readings needed for 22.4% -

RCS - TI 410, 420 10° \therefore 5°
C leg temp readings needed for 242°, 272°
also there are curve readings needed

		NORM	ADVERSE
Criteria	4	245-624	402-617 °F
Requirement Number	(5)	245-624	321-617 °F
	(6)	166-222	186-242 °F

RCS - TI 413, 423 10° \therefore 5°
reading needed for 274 °F

RCS - PI 475, 485, 495 20° \therefore 10°
procedures ask for readings to ending with 5's
other 3 readings to 2, 3, 5, 8

2GIS - LR 100

WTR level

graduations of 10 inches therefore we can read to 5 inches
 readings needed for 44", 24"
 also curve reading between 772.9 - 737.9
 (note scale only goes from 0-700")

2FWE - LR 104A1

10 inches in

5 inches

PRI plot design

reading needed for 24 inches

WTR stor tk

2SIS FI 945, 946

100 gpm in

50 gpm

WTR level

reading needed for 1025 gpm
 curve to be read (39.5 - 585.2)

2SIS FI 940, 943

100 gpm in

50 gpm

WTR

curve to be read (39.9 - 585.2)

✓ also log scale, operator cannot read below 200 gpm accurately

2 FWS - FI 476, 486, 496

2 FWS FI 477, 487, 497

100 gpm in

50 gpm

FW flow

Instrumentation Req table asks for 25 gpm

2FWE *FI 100 A, B, C, D

can't read 2F gpm because there are
log scales (0-100) which have no graduation
between 0-100 gpm

2CHS FR 154 A, B

2CHS: Seal leakoff flow ^{available} minimum reading is .5 gpm
reading required is .2 gpm

Addendum to
Suitability
HED # 2*** - 2213
:

Setpoints are too precisely defined
to actually be read on scale.

RCS W/R Pressure	1849	psig
PDWST level	24, 343	inches
Steamline Pressure	525	psig
Steam Generator NR level	3.5, 4.5, 32.5	%
RCS pressure	181, 183	PSIG
AFW Flow	362	Gpm
Total Feed Flow	362	Gpm
SG pressure	665	PSIG
RWST Level	444	inches
RCP Amps	975	amps
AFW NR level SG	4.5 - 50	% (log scale)

CLARIFICATIONS TO HED NO. 2***-2213

SH.1 OF 3

MOST OF THE SPECIFIC INSTRUMENTS LISTED IN THE HED APPEAR TO BE ADEQUATE IF THE SETPOINTS IN QUESTION CAN BE REVISED WITHOUT ~~IMPACTING~~ IMPACTING THE OPERATION OF THE PLANT. IT APPEARS THAT IN MOST CASES THE SETPOINTS ARE MORE PRECISELY DEFINED THAN IS NECESSARY AND THAT REVISING THE SETPOINTS SHOULD NOT HAVE ANY IMPACT ON PLANT OPERATION. IT IS RECOMMENDED, HOWEVER, THAT THE SELECTION OF THESE (AND ANY OTHER) SETPOINTS BE CO-ORDINATED WITH BV-1 SO THAT ~~WHERE WHERE~~ WHERE APPROPRIATE BOTH BV-1 AND BV-2 WILL HAVE THE SAME SETPOINTS.

FOR THE FOLLOWING INSTRUMENTS THE HED STATEMENTS SUGGEST THAT EITHER THE PRESENT INSTRUMENTS ARE INADEQUATE OR THAT THE HED STATEMENTS ARE A MISINTERPRETATION OF THE ACTUAL OPERATIONAL REQUIREMENTS. THESE INSTRUMENTS ARE:

ZQSS-LR100 SCALE DOES NOT COVER NEEDED RANGE. THIS WAS ALSO ~~RE~~ NOTED IN HED NO. 2V***-2007 AND WILL BE HANDLED AS PART OF THAT HED.

ZSIS # FI 945 AND 946 HED STATES THIS INSTRUMENT MUST BE READ FROM 39.5 ~~TO~~ TO 585.2. THESE NUMBERS WERE PROBABLY OBTAINED FROM ATTACHMENT 3 OF EOP "ECA-1.1". ATTACHMENT 3, HOWEVER, IS APPLICABLE TO STEP 11 OF ECA-1.1 WHICH REQUIRES THE OPERATOR TO OPERATE THE APPROPRIATE NUMBER OF HHSI/CHARGING PUMPS TO PROVIDE AT LEAST THE MINIMUM SI FLOW REQUIRED. ZSIS # FI 945 AND 946 MONITOR DISCHARGE FROM THE LHSI PUMPS. THEREFORE, ~~THE~~ THE HED STATEMENT THAT VALUES

CLARIFICATIONS TO HED NO. 2***-2213

SH. 2 OF 3

FROM 39.5 TO 585.2 GPM MUST BE READ IS INCORRECT. THE EXISTING INSTRUMENT HAS A SQUARE ROOT SCALE FROM 0 TO 5000 GPM. ABOVE 1000 GPM THERE IS A DIVISION FOR EVERY 100 GPM. ~~THESE~~ ^{APPROXIMATELY} A READING A VALUE OF 1025 GPM IS POSSIBLE THEN ALTHOUGH THE SETPOINT MAY HAVE TO BE CHANGED TO EITHER 1000 GPM OR 1050 GPM. NO HARDWARE CHANGE APPEARS NECESSARY.

2 SIS # FT. 940 AND 943

→ THESE INSTRUMENTS INDICATE HHSI FLOW. AS INDICATED IN THE HED (PROBABLY BASED UPON ATTACHMENT 3 OF EOP "ECA-1.1" AND STEP 12 OF THAT PROCEDURE) THE OPERATOR IS REQUIRED TO PROVIDE A "MINIMUM SI FLOW" RANGING FROM 39.9 TO 585.2 (AS A FUNCTION OF TIME). THE EXISTING INSTRUMENTS HAVE A SQUARE ROOT SCALE FROM 0 TO 1000 GPM. ABOVE 200 GPM THERE IS A DIVISION FOR EVERY 20 GPM. BELOW 200 GPM THERE ARE ONLY DIVISIONS FOR 0 AND 100 GPM.

ONE OF THE P STATED PURPOSES OF THE PROCEDURE IS "TO DELAY DEPLETION OF THE RWST BY REDUCING OUTFLOW". IF OPERATIONS INTENDS TO ESTABLISH THE MINIMUM SI FLOW AS APPLICABLE FROM ATTACHMENT 3 OF EOP "ECA-1.1" AND ~~THE~~ ALSO TO THROTTLE THE FLOW TO KEEP THE SI FLOW JUST ABOVE THIS MINIMUM SI FLOW THE EXISTING FLOW INDICATORS MAY BE INADEQUATE. IF OPERATIONS IS ONLY CONCERNED THAT AT LEAST THE MINIMUM SI FLOW IS ESTABLISHED WITHOUT REGARD TO MINIMIZING DRAWDOWN ON THE RWST, THEN THE EXISTING INSTRUMENTATION IS

CLARIFICATIONS TO HED NO. 2***-2213

PROBABLY ADEQUATE. THE ACTUAL OPERATING REQUIREMENTS SHOULD BE REVIEWED BY OPERATIONS STARTUP GROUP. IF MINIMUM RWST DRAWDOWN IS AN OPERATIONAL REQUIREMENT IN THIS CASE A CHANGE REQUEST SHOULD BE SUBMITTED TO INVESTIGATE THIS FURTHER.

INSTRUMENTS (NOT ANY MORE)
 2FWE & FI 100 A, B, C, AND C₂ THESE ~~SOME~~ HAVE SQUARE ROOT SCALES (NOT LOG SCALES).
 (AUX PW FLOW)
 NOTE: LINEAR SCALES RANGING FROM 0 TO 400 GPM HAVE NOW BEEN INSTALLED, MED
 THE FACT THAT THERE IS ONLY ONE GRADUATION BETWEEN 0 AND 100 GPM (ON THE 0 TO 400 GPM SCALE) IS ADDRESSED AND WILL BE DISPOSITIONED AS PART OF HED NO. 2VC6-2218.

2CHS - FR154A AND B THE FACT THAT IT IS DIFFICULT TO READ THE LOW END OF THESE SQUARE ROOT SCALES TO THE REQUIRED DEGREE OF ACCURACY IS ADDRESSED AND WILL BE DISPOSITIONED AS PART OF HED NO. 2VA9-2403.
 (RCP No. 1 SEAL WTR. LEAKOFF)

ADDITIONAL CLARIFICATIONS:

- 1) 2RCS - 410 AND 420 LISTED ON THE HED SHOULD BE 2RCS & TI 410 AND 420 OK
- 2) THE LAST ENTRY ON THE PAGE MARKED "APPENDUM TO SUITABILITY HED # 2***-2213" CALLED "APW NR LEVEL" DOES NOT MAKE SENSE, SINCE IT IS REFERRING TO MEASURING THE LEVEL OF A FLOW!. THE CORE TEAM SHOULD CHECK INTO WHAT INSTRUMENT WAS OF CONCERN.

↳ This was checked; required reading is 'Steam Generator Marion Range level', MED.

D. Jones 10-31-85

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2XXX-2220

d) REVIEWED BY: D. J. Vorhies e) DATE: 5/3/85
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: Setpoints are not readable
on scales.

g) ITEMS INVOLVED: see attached list;

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.5.1.2 a.
Scale selection - scale units are not consistent with degree
of precision and accuracy needed by operator.

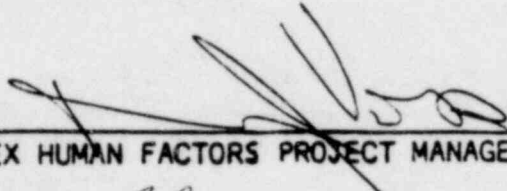
i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER: Verification of Task Performance Capabilities
- suitability (R405)
MF

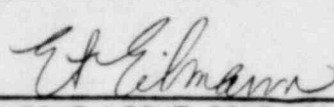
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

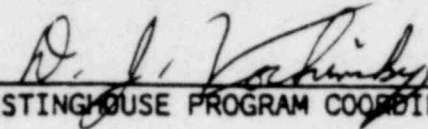
Operators response may be delayed
or incorrect.

k) REVIEW AND RECOMMENDATIONS: Setpoints could be marked on scales as appropriate. Also, rounding of setpoints to the next conservative number is suggested.

As suggest above.


ESSEX HUMAN FACTORS PROJECT MANAGER

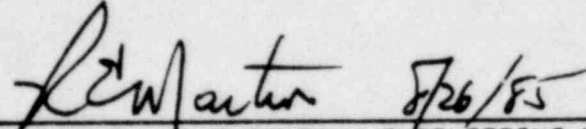

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

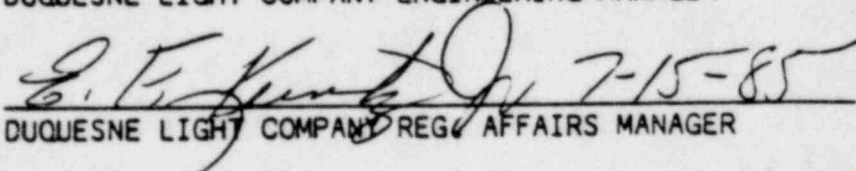

WESTINGHOUSE PROGRAM COORDINATOR

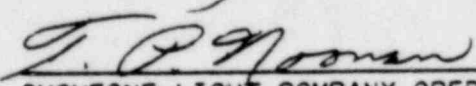
1) REVIEW AND DISPOSITION:

Agree - No action

Set point values should not be defined to ^{nearest} 0.1 %, ~~which is the intent~~ Agreed, setpoints should be rounded as suggested by this HED. ^(MED)


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

2***-2220

;

RCS Cold leg temp ($^{\circ}\text{F}$) 222 $^{\circ}$

2RCS - TI 410, 420

SG Pressure (psig)

1035

525

142

2HSS*PI 475, 485, 495

1075

275

Atmospheric Pressure

WR RCS Pressure (psig)

360

2RCS *PI 402, 403

SG NR level

54.1%

2FWS*LI 474, 484, 494

PRZR level

57.4%

2RCS*LI 459A, 460, 461

RCP CCP sys return Flow ($^{\circ}\text{F}$) <124 $^{\circ}$

2CCP - TI 105 A, B, C

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS/2
PLANT/UNIT

b) ORIGINATOR: J. Downing c) HED NO.: 2444-1109

d) REVIEWED BY: W. J. Catullo e) DATE: 8/3/84
(Westinghouse)

T. Woods
(Essex)

f) HED TITLE: Coordinate Axes of large matrices
not labeled for identification

g) ITEMS INVOLVED: see attached sheet.

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:
Large matrices of similar components should have the coordinate axes labeled for identification of any single component within the grid. Matrices of status lights do not comply with this requirement. 6.8.3.2d(1)

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Labels and Location Aids Survey

TP6.1B3.64

DLCIN R403

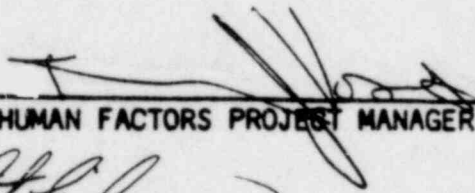
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Delay in observation of proper component or observation of incorrect component may result from this discrepancy.

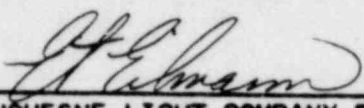
k) REVIEW AND RECOMMENDATIONS:

I investigate the requirements for labeling the coordinate axes of status light panels and determine the feasibility of labeling these axes.

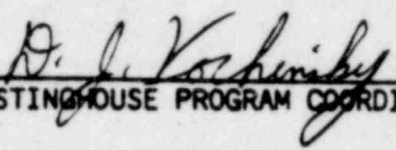
- Unit 1 has ~~an~~ alpha-numeric labels on the coordinate axes of all status light panels; recommend the same for Unit 2.



ESSEX HUMAN FACTORS PROJECT MANAGER



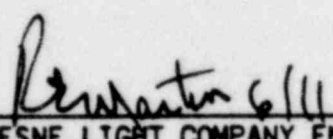
DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER



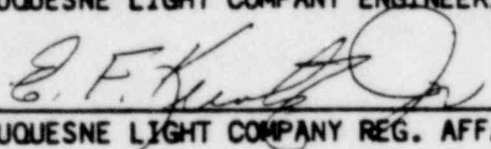
WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

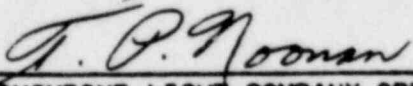




DUQUESNE LIGHT COMPANY ENGINEERING MANAGER



DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER



DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HED #

HED# 2444-1109

Status - light panels:

man actuation sys. INOP TRAIN A	(1069)	PNL BA3
man actuation sys. INOP TRAIN B	(1070)	PNL BA3
main stm dnn isolation status	(1020)	PNL VC4
Extract stm / str heater isolation valve status	(1019)	PNL VC5
stm bypass system status	(18)	PNL BC
stm gen trip signal status	(19)	PNL BC
stm gen trip signal status	(47)	PNL BC
Primary Plant Parameters	(308)	PNL BB
Reactor Coolant pump status	(465)	PNL BA4

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS/2
PLANT/UNIT

b) ORIGINATOR: N. KFOURY c) HED NO.: ~~2XXX~~-1111

d) REVIEWED BY: *W. P. Catullo*
(Westinghouse) e) DATE: JULY 23, 1984

[Signature]
(Essex)

f) HED TITLE: INCONSISTENCY OF TERMS, ABBREVIATIONS AND ACRONYMS

ACROSS LABELING; NOT ADMINISTRATIVELY CONTROLLED.

g) ITEMS INVOLVED: SEE ATTACHED LIST for samples

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

INCONSISTENT USE OF TERMS, ABBREVIATIONS AND ACRONYMS
BETWEEN LABELS IN CR AND AT EMERGENCY SHUTDOWN PANEL;
APPROACH LIST NOT ADMINISTRATIVELY CONTROLLED. G.L.3.3. a.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER: CONVENTIONS SURVEY TP8.1-B4(1):(2) DL CIN R40
DELAYS SURVEY TP5.1B3.13

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

MAY CAUSE DELAYS AND/OR ERRORS IN OPERATOR RESPONSES.

k) REVIEW AND RECOMMENDATIONS:

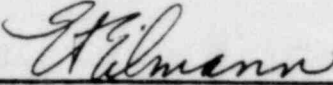
- 1) REENGRAVE INCONSISTENT LABELS TO CONFORM TO THE APPROVED LIST OF TERMS, ACRONYMS, AND ABBREVIATIONS.
- 2) ENSURE ADMINISTRATIVE CONTROL OF APPROVED LIST

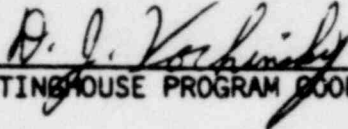
OK

2/11/85

Verification of suitability data collection process also suggested this HED.

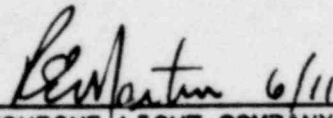

ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

OK Consistent Labelling & nomenclature will exist and appropriate nomenclature will be in Admin. Manuals.


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

LACK OF CONSISTENCY ACROSS LABELS

EXAMPLES

APPROXIMATELY 25% OF ALL LABELS
ARE INCONSISTENT

ITEM NO.	BOARD SECTION	PLATE TYPE	ENCRAVING
1. 3B	VC-8	BW3	SYNCH VOLTS INCOMING EMER.
4B	VC8	BW3	SYNCHRONIZING VOLTS RUNNING EMER.
2. 11	EC-3	BW3	MAIN GENERATOR-2 FREQUENCY
12A	BC-3	BW-3	EMER GEN 2-2 4 KV BUS 2DF AMPS
3. 78	EC-1.	PB3	21C SG MAINFEED REG CONTROL 2FWS + FCV498 DC2-06
7A	EC-2	PB3	STM GEN 21A MAIN STM VLV BYPASS VLV 2MSS + SOV102A2
4. 133	EC-2	BW3	MAIN TURBINE EMERGENCY OC BEARING OIL PUMP 2TML - P215
134	EC-2	BW3	TURB EH FLUID PUMP 2TMB - P209A
5. 795B-2	VA-5		REACTOR CONTMT PRESSURE 2LMS + P1953
196 A	VA-5	BW3	REACTOR CONTAINMENT TOTAL PRESSURE 2CVS - P1101A1
6. 1091	EC-1	BW3	STEAM GENERATOR START-UP FEED PUMP 2FWS - P24
1093	EC-1	BW3	STM GEN START-UP FO PUMP AUX LUBE OIL PUMP

ITEM NO.	BOARD SECTION	PLATE TYPE	ENGRAVING
7. 217	EMERGENCY SHUTDOWN PANEL	PB3	PRESSURE/TEMP HEATERS BACKUP GROUP B ARCA # H2B BT 2P
219	EMERGENCY SHUTDOWN PANEL	BW3	PEER AUX SPRAY ISOLATION VALVE 2CAS & MOV 311 21
8. 102	BUILDING SERVICE CONTROL PANEL	BW3	SER BLDG CHARG FILT 255A DEWYE VALVE 2FAW - SIV 226
105	BUILDING SERVICE CONTROL PANEL	BW3	SERV BLDG HOSE STATION ISOLATION VALVE 2FAW - SOV 223

ABBREVIATIONS USED THAT ARE NOT ON THE ABBREVIATIONS LIST APPROXIMATELY 1%

ABBREVIATION	ITEM NO.	BOARD SECTION	PLATE TYPE
SERV	188A	DC-3	BW3
CROM	453	DB 4	BW3
MIN	564	BA-2	OB3
SVC	581	CA-2	PB3
SEL	593	CA-2	PB3
DEBORAT	738	CA-4	—
SGC	837A-2	VA-8	BW1
SWE	905	VA-6	BW1
FPW	124	BUDG SERVICE CONT PNL	BW3

INCORRECT ABBREVIATIONS

APPROXIMATELY 1%

INCORRECT	ON LIST	ITEM NO.	BOARD SECTION	PLATE TYPE
CONTMT	CNMT	281-1	VA-6	BW1
EMERG	EMER	529	BA-2	PB3
SAFETY INJECT	SI	902F-2	VA-6	BW1
STM GEN	SG	1516	BA-1	PB3

a) BVP-2
PLANT/UNIT

5

b) ORIGINATOR: M. Francher c) HED NO.: 2xxx-1113d) REVIEWED BY: D. J. Vachinsky e) DATE: 1/12/55
(Westinghouse)[Signature]
(Essex)f) HED TITLE: Some labels are incorrectg) ITEMS INVOLVED:
see attached listh) PROBLEM DESCRIPTION AND 070C PARAGRAPH NUMBER: 6.6.1.1

Some Controls, displays and other equipment items that must be located, identified or manipulated are not appropriately or clearly labeled to permit rapid and accurate human performance.

1) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Verification of task performance capabilities; Sensitivity (R405) 6.2.1.2

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:


Operator response may be detained

k) REVIEW AND RECOMMENDATIONS:

All labels should be corrected as listed

on attachment

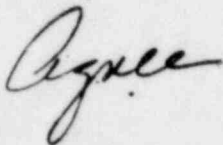
- HED 2***-1111 recommends relabeling in accordance with an approved list of terms, abbreviations and acronyms. This HED reinforces that recommendation.

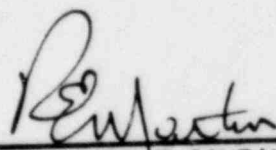

ESSEX HUMAN FACTORS PROJECT MANAGER

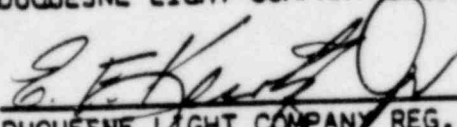

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

l) REVIEW AND DISPOSITION:



 10-24-85
DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 6-21-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

VC5 2FNC - LI 102A, B → Label says A
should be B

VC5 2FWE - LR 104A
label reads " PRE " Plant Demin Wtr Star TK
should read " PRI "

VC8 2SIS - FI 943 ^{on mockup} label reads " BORON INJ HDR
should read HH INJ HDR

VC6 AFW 2FWE * FI 100A, B, C1, C2

labels read	100 B2	100 B	100 C2	100 C2
should read	100 A	100 C1	100 B	100 C2

VC4 2CHS * SOV 206 = label on plans and ECP but,
2CHS * AOV 206 = label on panel

VC3/VC4 2CCP * P21C Primary Comp Cooling Wtr pump
- there are two of the above #'s although we cannot tell which
- this is OK, a pump has a control for each train

VC4 label reads Emergency Generator 2-2 Gov Speed
- but the switch is for a voltmeter

BA2

BA3 2 RHS * MCV 701B, 701A

this is a values (both trains)
- there are two of each of these Markin's found on
- the panels - although the markings are not the same as the original drawings

Verification OF Suitability

HED #

Title

Z*** - 1113

Some labels are incorrect

- ① labels on [2S15*MOV867A, C] say: Refueling Water Storage Tk
↓
[2S15*MOV867B, D] say: Refueling Water Storage Tank
these should be ^{changed} ~~made~~ to match (i.e., Tank or Tk)

- ② Existing: Emergency Boratron AOV 206
label

should be: Alternate Emergency Boratron SOV 206

- ③ Existing: Boric Acid to charging pump suction MOV 350
label

should be: Emergency Boratron MOV 350

Labeling problems

2xxx-1113

✓ control = "Main Feed Pump"
meter = "Stm Gen Feed pump"

✓ control = "Aux Feed Pump"
meter = "Stm Gen Aux Feed pump"

✓ Procedure asks for
bypass valve [2CNS - MOV105]
but label reads [2CNM - MOV106]

✓ ~~Spent Fuel Pool level~~
~~label reads "A"~~
~~but should be "B"~~

✓ label reads "Quench pump"
should read "Quench Spray Pump"

existing label reads: "Moisture separator reheater steam supply valve"

Procedure reads: "Reheater flow control block valves"
[2MSS-MOV 100A, B]

Diesel Output breakers

exist as "2E10, 2F10" this is correct, see HED-2xxx-1115

~~labels should read "2E9, 2F9" to make them consistent w/ Unit 1~~

BBB4 label reads "Chemical Addition pump [2QSS-P23]"

should read "Chemical Addition Tank recirc. pump"

BBA1 2QSS * SOV 100A, 101A, 102A.

label reads: Chemical Injection pump discharge

should read: Chemical Addition pump discharge

label reads "standby service water pumps"
operators like "Auxiliary service water pumps"

THE FOLLOWING COMMENTS, ^{CLARIFICATIONS} AND CORRECTIONS APPLY TO THE INDIVIDUAL ITEMS LISTED ON THE REFERENCED HED:

1. THE NAMEPLATE LISTING (i.e. "NAMEPLATE ENGRAVING LIST" DATED 11-30-83) FOR ITEM 908B-1 SHOULD READ 2FNC-LI 102B. MAKE CORRECTION.

3. THE NAMEPLATE LISTING FOR "2SIS * FI943" (ITEM 1008) IS

"
HIGH HEAD
SAFETY INJECTION FLOW A
2SIS - FI943"

THESE WORDING APPEARS ADEQUATE EXCEPT THAT THIS IS A PAM INSTRUMENT AND AN ASTERISK SHOULD APPEAR IN THE MARK NO. INSTEAD OF A DASH. THE SAME COMMENT APPLIES TO ITEM 1009. NOTE THESE INSTRUMENTS ARE ON VERTICAL BOARD SECTION A8 NOT A6.

2. THE NAMEPLATE LIST FOR ITEM 1015, 2FWE-LR104A1, READS:

"
PRIMARY GRADE WATER
STORAGE TANK LEVEL
2FWE-LR104A1"

THE APPLICABLE MAIN CONTROL BOARD FRONT VIEW DRAWING, 12241-RE-25A, ALSO REFERS TO "PRIMARY GRADE WATER ... LEVEL". OTHER DOCUMENTS, INCLUDING APPLICABLE FLOW DRAWING 12241-RM-45B REFER TO THIS TANK, 2FWE * TK210, AS "PRIMARY PLANT DEMINERALIZED WATER STORAGE TANK". THE PREFERRED NAME SHOULD BE USED ON THE MCB AND

AN ATTEMPT TO STANDARDIZE THE USE OF THIS PREFERRED NAME ON ALL BV-2 PROJECT DOCUMENTS SHOULD BE MADE.

4. THE NAMEPLATE LIST AND DRAWING 12241-RE-25R, ITEMS 997 AND 998, ARE THREE POINT INDICATORS FOR 2FWE # FI 100A, 100B AND 100C AND 2FWE # FI 100AZ, 100BZ AND 100CZ, RESPECTIVELY. THIS IS CORRECT AND NO CHANGES ARE NEEDED.
5. THE NAMEPLATE LIST HAS ITEM 786 AS "2CHS # AOV206". THIS IS INCORRECT SINCE THIS VALVE IS A DIRECT ACTING SOLENOID VALVE. CHANGE NAMEPLATE LIST TO "2CHS # SOV206".
6. THIS EQUIPMENT, 2CCP # PZIC, IS A SWING PUMP WHICH CAN BE POWERED FROM EITHER THE ORANGE OR PURPLE TRAINS. THEREFORE, THERE ARE TWO CONTROLS FOR 2CCP # PZIC ON THE MCB. NO CHANGE NEEDED.
7. THE NAMEPLATE LIST HAS ITEM 217 AS "EMERGENCY GENERATOR 2-2 GOVERNOR SPEED". THIS SWITCH IS A GOVERNOR CONTROL USED TO CONTROL THE EMERGENCY DIESEL ENGINE SPEED. ANY NAME WHICH CONVEYS THIS MEANING TO THE OPERATOR SHOULD BE ACCEPTABLE. AGREEMENT WITH EXISTING BV-1 TERMINOLOGY FOR THIS CONTROL SHOULD BE CONSIDERED. TWO POSSIBLE NAMES ARE:
"EMERGENCY GENERATOR 2-2
SPEED CONTROL"
OR
"EMERGENCY GENERATOR 2-2
GOVERNOR CONTROL"

ITEM 182 WHICH IS THE SAME CONTROL FOR EMERGENCY DIESEL GENERATOR 2-1 USES THE LATTER TERM. THE TERMS FOR ITEMS 182 AND 217 SHOULD BE IN AGREEMENT.

8. 2RHS#MOV 701B AND 2RHS#MOV 701A. SEE ~~ITEM~~ ITEM 6 ABOVE.
NO CHANGE NEEDED.

9. LABELS FOR 2SIS#MOV 867A&C AND 2SIS#MOV 867B&D. ATTEMPT TO STANDARDIZE USE OF TANK OR TK WHERE POSSIBLE. DON'T SEE THIS INCONSISTENCY AS IN ANYWAY CONFUSING TO THE OPERATORS, HOWEVER.

10. & 11. THE PRESENT TITLE FOR ITEM 786 IN THE "NAMEPLATE ENGRAVING LIST (DATED 11-30-83)" IS: "EMERGENCY BORTION

2CHS#AOV 206 "

ITEM 764 IN THE SAME LIST IS CALLED: " ~~CHS~~

" CHARGING PUMPS SUCTION VALVE

FROM BORIC ACID TANKS

2CHS#MOV 350 "

ITEM 786 IS IN ERROR SINCE THAT VALVE IS STRICTLY SOLENOID OPERATED (I.E. MARK NO. IS 2CHS#SOV 206).

THE TITLES USED IN THE NAMEPLATE LIST ARE CONSISTENTLY USED ON OTHER BV-2 DOCUMENTS.

CHANGING TO THE TITLES SUGGESTED IN THE HED: "ALTERNATE EMERGENCY BORTION" (FOR ITEM 786) AND "EMERGENCY BORTION" (FOR ITEM 764) HAS MERIT IF THAT IS THE MANNER IN WHICH THE BV-2 OPERATORS WILL UTILIZE THESE VALVES AND/OR THE CORRESPONDING BV-1 VALVES HAVE BEEN IDENTIFIED BY THOSE TITLES.

12. ITEMS 66 AND 67, THE CONTROLS FOR THE TWO STEAM GENERATOR FEEDWATER PUMPS ARE LISTED IN THE NAMEPLATE LIST AS:

" 21A MAIN FEED PUMP

ZFWS-P21A "

AND

" 21B MAIN FEED PUMP

ZFWS-P21B "

THIS LABELLING WAS AT THE REQUEST OF THE DLC/SUG UPON REVIEW OF THE PREVIOUS VERSION OF THE NAMEPLATE LIST. THE PREVIOUS LABEL FOR ITEM 66 WAS:

" STM GEN FEED PUMP

ZFWS-P21A "

THIS PREVIOUS LABELLING WAS IN AGREEMENT WITH THE ^{ASSOCIATED} METER LABELS, WAS THE "OFFICIAL" NAME OF THE EQUIPMENT AND DID NOT REPEAT THE "21A" PORTION OF THE MARK NO. IN BOTH LINES OF THE NAMEPLATE. FROM A HUMAN FACTORS ASPECT IT IS RECOMMENDED THAT THE PREVIOUS LABELLING BE USED FOR CONSISTENCY.

3. ITEMS 223 AND 224 IN THE NAMEPLATE LIST READ (FOR ITEM 223):

" 23A AUXILIARY FEEDWATER PUMP

ZFWE # P23A "

THIS LABELLING WAS REQUESTED BY THE DLC/SUG UPON REVIEW OF THE

PREVIOUS VERSION OF THE NAMEPLATE LIST. FROM A HUMAN FACTORS ASPECT IT IS NOT NECESSARY TO REPEAT THE "23A" PORTION OF THE MARK NO. ON THE NAMEPLATE AND THE NAMEPLATE SHOULD ^{REFER} ~~REVIEW~~ TO THE STEAM GENERATORS. A RECOMMENDED LABEL WOULD BE:

" SG AUXILIARY FEEDWATER PUMP
2FWE X P23A "

14. NAMEPLATE LIST ITEM 44 ^{is} :

" CONDENSATE SPILL VLV BYPASS
2CNS - MOV105 "

THIS LABELLING IS CORRECT. THE APPLICABLE MCB FRONT VIEW DRAWING (12241-RE-25U) HAS THE INCORRECT ~~IN~~ MARK NO. FOR ITEM 44 (i.e. 2CNM-MOV105). DRAWING 12241-RE-25U WILL BE CORRECTED, NO OTHER ACTION NECESSARY.

15. ITEMS 561 AND 605 ARE LISTED AS "QUENCH PUMP" ON THE NAMEPLATE LIST AND OTHER PROJECT DOCUMENTS. SOME BV-2 DOCUMENTS INCLUDING THE PSAR REFER TO 2QSS*P21A & 2QSS*P21B AS "QUENCH SPRAY PUMPS". RECOMMEND BV-1 AND BV-2 USE A COMMON TITLE (WHICHEVER IS PREFERABLE). ~~QUENCH~~
~~SPRAY PUMPS~~ ~~FOR~~ NOTE THAT IF TITLE FOR ITEMS 561 & 605 IS CHANGED ITEMS 561, 563, 606 AND 607 SHOULD ALSO BE REVISED ACCORDINGLY. (THESE ARE DISCHARGE AND SUCTION VALVES FOR THE PUMPS).

16. ITEMS 110 AND 111 ON NAMEPLATE LIST. ITEM 110 READS:

" MOISTURE SEPARATOR REHEATERS
H21 A&C STEAM SUPPLY VALVE
2M33 - MOV 100A "

ITEM 111 IS FOR H21 B&D. RECOMMEND THAT BV-1 AND BV-2 USE IDENTICAL NAMES FOR THESE VALVES IF THE SYSTEMS ARE IDENTICAL. THE NAME USED IN THE ~~THE~~ "PROCEDURE", ~~THE~~ (MOISTURE SEPARATOR) REHEATER FLOW CONTROL BLOCK VALVE" SEEMS AN ACCEPTABLE ALTERNATIVE.

17. EMERGENCY DIESEL OUTPUT BREAKERS ARE 2E10 AND 2F10. NO CHANGE NEEDED.

18. NAMEPLATE LIST ITEM 406 READS:

" CHEMICAL ADDITION PUMP
2QSS-P23 "

DISAGREE THAT NAME BE EXPANDED TO "CHEMICAL ADDITION TANK RECIRCULATION PUMP".

19. 2QSS*SOV100A, 101A AND 102A (ITEMS 1502, 1503, AND 1504). LABELS FOR THESE ITEMS WITH REFERENCE TO CHEMICAL INJECTION PUMPS IS CORRECT. ITEMS 1501 AND 150⁵~~8~~ (2QSS*P24A AND 2QSS*P24B) SHOULD READ "CHEMICAL INJECTION PUMP" NOT "CHEMICAL ADDITION PUMP". ~~NAMEPLATE~~ NAMEPLATE LISTING SHOULD BE CORRECTED.

20. HED SUGGESTION IS TO CHANGE TITLE OF "STANDBY SERVICE WATER PUMPS" TO "AUXILIARY SERVICE WATER PUMPS". THE PRESENT TITLE FOR THESE PUMPS (2SWE#P21A AND 2SWE#P21B) HAS BEEN CONSISTENTLY USED ON BV-2 DOCUMENTS.

IN SUMMARY, I DISAGREE WITH THE STATEMENT ON THE HED SECTION K) "REVIEW AND RECOMMENDATIONS" THAT "ALL LABELS SHOULD BE CORRECTED AS LISTED ON ATTACHMENT" SINCE IN SEVERAL CASES THERE IS NOT SUFFICIENT JUSTIFICATION GIVEN THAT THE CHANGE WOULD BE AN IMPROVEMENT EITHER BY BEING MORE TECHNICALLY CORRECT AND/OR BEING CONSISTENT WITH ESTABLISHED TERMINOLOGY ON BV-1. ALSO, IN SOME CASES THE STATEMENT ^{IN THE HED} ~~DOES NOT~~ ^{DOES} NOT AGREE WITH THE LISTING IN THE "NAMEPLATE ENGRAVING LIST (DATED 11-30-83)" WHICH THE CONTROL ROOM REVIEW TEAM SHOULD BE USING AS THE BASIS FOR COMPARISON (AND AS WHAT PRESENTLY "OFFICIALLY" EXISTS ALTHOUGH IN PRELIMINARY FORM).

SOME OF THE RECOMMENDED CHANGES IN THE HED MAY BE JUSTIFIED. ~~THE~~ THE REVIEW TEAM SHOULD VERIFY WITH BV-1 WHETHER THESE CHANGES ARE IN AGREEMENT WITH BV-1 TERMINOLOGY FOR THE IDENTICAL COMPONENT, ESPECIALLY IN THOSE CASES WHERE THE EXISTING BV-2 TERMINOLOGY IS TECHNICALLY CORRECT.

D. Guco 10-21-85

a) BUFS
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2***-1115

d) REVIEWED BY: A. J. Vachinsky e) DATE: 3/28/85
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: Incorrect labeling on control board

g) ITEMS INVOLVED: see review + recommendations for list of items.

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.6.3.1 a.
6.6.3.2 a.

The ~~listed~~^{new} existing labels do not correspond to an operators expectations of how the listed items should be labelled.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Validation of Control Room Functions (R406)

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Delayed or incorrect response from operator

K) REVIEW AND RECOMMENDATIONS:

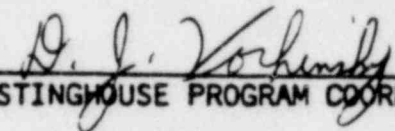
- ① change: "Chemical ^{addition} ~~injection~~ pumps" to "Chemical ^{injection} ~~addition~~ pumps"
- ② change: "~~REST~~ Chemical ^{addition} ~~injection~~ pumps" to "^{Quench Spray} ~~REST~~ Chemical addition pumps"
- ③ change: OCB 92⁴, OCB 83, to ~~OCB 85⁴, OCB 81⁴~~ ^{OCB 94⁴, OCB 85⁴}
- ④ change: 2E10 & 2F10 to 2E9 & 2F9

①+② should be changed.

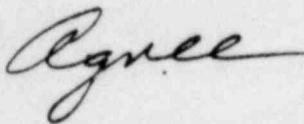
④ should not be changed (2E10 & 2F10 are involved). Changing them would cause problems between Unit 2 and Unit 1, e.g. a T.

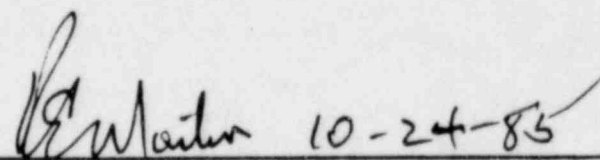

ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:


Agree


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

CLARIFICATIONS TO HED No. 2***-1115

SH. 1 OF 4

IN RESPONSE TO THE FOUR ITEMS LISTED UNDER "REVIEW AND RECOMMENDATIONS" THE FOLLOWING COMMENTS APPLY:

1. PUMPS "2QSS# P24A AND 2QSS# P24B" ARE CONSISTENTLY REFERRED TO AS "CHEMICAL INJECTION PUMPS" ON BV-2 DOCUMENTS (i.e. FSAR, DRAWINGS AND SYSTEM DESCRIPTIONS). THE "NAMEPLATE ENGRAVING LIST" (DATED 11-30-83), ITEMS 1501 & 1505, INCORRECTLY LIST THESE PUMPS AS "CHEMICAL ADDITION PUMPS". THE NAMEPLATES SHOULD READ "CHEMICAL INJECTION PUMPS". OK, ^{IMED}
2. IT IS NOT CLEAR WHAT PUMPS ARE BEING REFERENCED. IT APPEARS THAT THIS IS ANOTHER REFERENCE TO THE PUMPS DISCUSSED ABOVE IN WHICH CASE THE COMMENT IS IN ERROR AND NO CHANGE IS NEEDED. PLEASE VERIFY. THE PUMP REFERENCED IS THE 2QSS-P23^(ITEM 406) PUMP. THE PRESENT LABEL READS "CHEMICAL ADDITION PUMP" IT SHOULD READ "QUENCH SPRAY CHEMICAL ADDITION PUMP", WITH APPROPRIATE ABBREVIATIONS.
3. OCB 92 AND OCB 83 POSITION INDICATING LIGHTS (RED FOR CLOSED, WHITE FOR OPEN) WERE ITEMS 198 AND 196, RESPECTIVELY, ON THE MAIN CONTROL BOARD FRONT VIEW DRAWING 12241-RE-25W-4 AND THE NAMEPLATE ENGRAVING LIST (DATED 11-30-83). DUE TO THE MODIFICATION OF THE 138KV OFFSITE POWER SUPPLIES TO BV-2 IMPLEMENTED DURING THE BV-1 REFUELING OUTAGE IN OCT. THRU DEC., 1984 OCB 92 AND OCB 83 ARE NO LONGER ASSOCIATED WITH BV-2. DRAWING 12241-RE-25W-5 SHOWS ITEM ¹⁹⁸ ~~198~~ IS NOW OCB 94 WHICH IS THE OFFSITE POWER SUPPLY FROM 138KV BUS 2 IN THE SWITCHYARD. ITEM 196 IS NOW OCB 85 WHICH IS CONNECTED TO 138KV BUS 1 IN THE SWITCHYARD. ALSO ITEM 1661 WAS ADDED FOR THE NEW "DISCONNECT SWITCH 89-2A" WHICH IS A MOTOR OPERATED DISCONNECT SWITCH ON THE ~~NEW~~ 138KV SIDE OF

CLARIFICATIONS TO HED NO. 2*** -1115

SH. 2 OF 4

SYSTEM STATION SERVICE TRANSFORMER 2A. SUGGEST THAT THE MIMIC BUS ASSOCIATED WITH ITEMS 1661 AND 196 SHOWN ON DRWG. 12241-RE-25W-5 BE MODIFIED (SIMILAR TO THE ATTACHED SKETCH ON THE FOLLOWING PAGE) TO REFLECT THAT ITEM 1661 IS PHYSICALLY CONNECTED TO OCB 85 AND IS NOT PHYSICALLY CONNECTED DIRECTLY TO 138KV BUS 2.

4. BREAKERS 2E16 AND 2F10. NO CHANGE REQUIRED.

D. Gues 10-4-85

CLARIFICATIONS TO HED No. 2444 - 1115
(SH. 3 OF 4)

SUGGESTED

4160V BUS 2A
TRANS 2A
AMPS

9A

4160V BUS 2A
TRANS 2A
AMPS

9C

4160V BUS 2A
TRANS 2A
AMPS

9E

4160V BUS 2A
TRANS 2C
AMPS

9B

4160V BUS 2C
TRANS 2C
AMPS

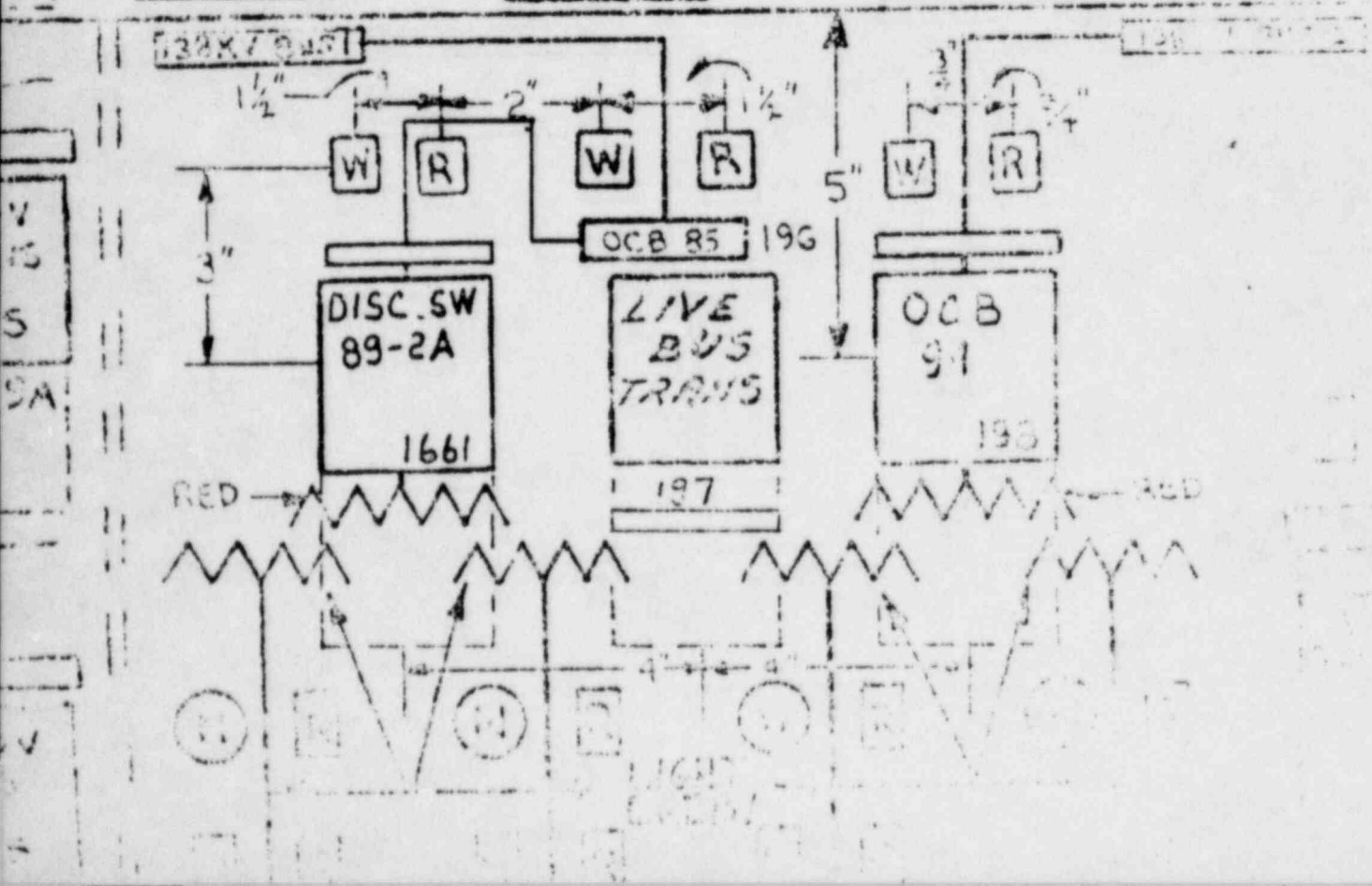
9D

4160V BUS 2C
TRANS 2D
AMPS

9F

4160V BUS
TRANS 2
AMPS

9



CLARIFICATIONS TO HED No. 2444-1115
(SH. 4 OF 4)

EXISTING (12241-RE-25W-5)

4160V BUS 2A
TRANS 2A
AMPS
9A

4160V BUS 2B
TRANS 2B
AMPS
9C

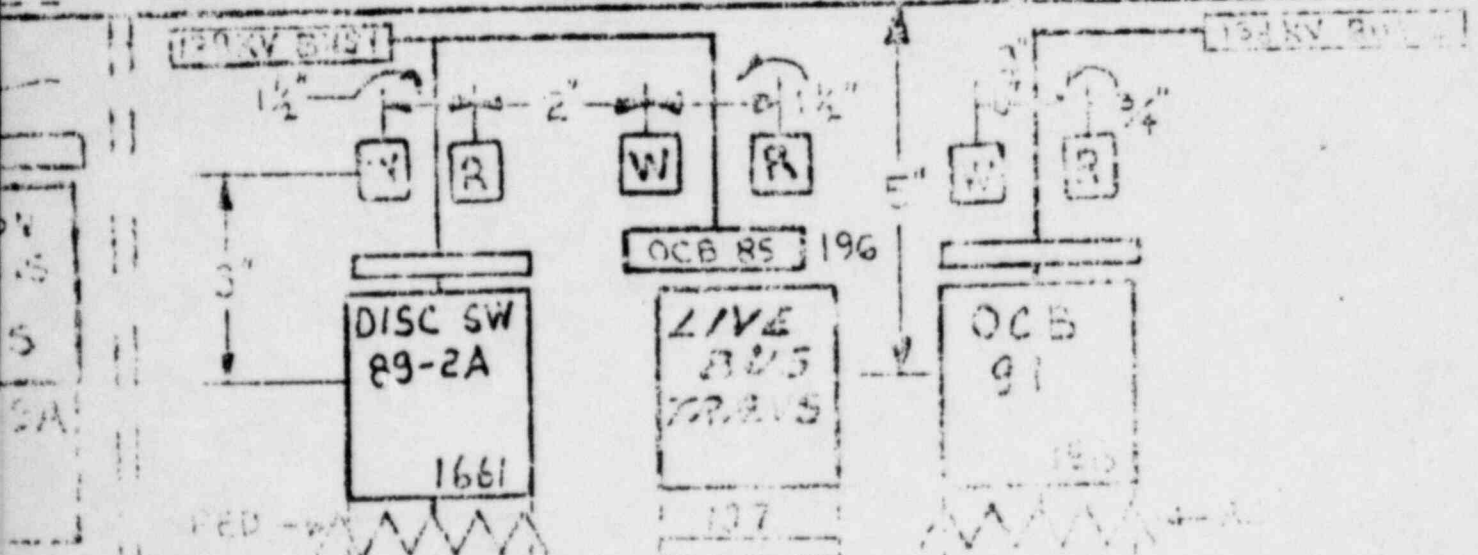
4160V BUS 2C
TRANS 2C
AMPS
9E

4160V BUS 2A
TRANS 2C
AMPS
9B

4160V BUS 2B
TRANS 2C
AMPS
9D

4160V BUS 2C
TRANS 2D
AMPS
9F

4160V BUS 2C
TRANS 2E
AMPS



ON VOI TO

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS -2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 211-11 ¹⁷

d) REVIEWED BY: D. J. Kuchinsky
(Westinghouse) e) DATE: 5/1/85

[Signature]
(Essex)

f) HED TITLE: Process controllers and some valves are
missing labeling for range

g) ITEMS INVOLVED: All process controllers; - including those on E.S.P.
throttle valves; 1,2,3,4;
governor valves: 1,2,3,4.

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.6.1.1

Labels are needed to permit rapid and accurate human performance. Display scales read 0-100%; but there is no labeling indicating which endpoint represents valve open - or valve closed.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Verification of ~~Con~~_{MF} Task Performance Capabilities
- Suitability (R405)

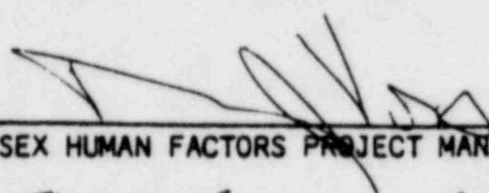
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

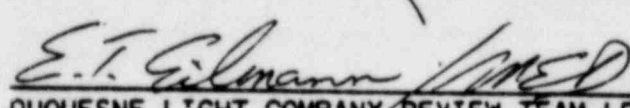
May result in operator error or
increased response time.

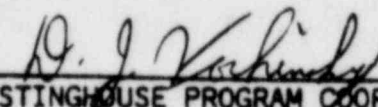
k) REVIEW AND RECOMMENDATIONS:

Ensure that proper labeling is installed as appropriate. Labeling should indicate which end of scale is open and which is closed.

As suggested above, remove throttle and governor may not need locking since these are direct set.


ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

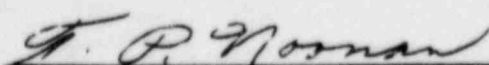

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

approved

 11-15-85
DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 11-14-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) BVPS-2

PLANT/UNIT

b) ORIGINATOR: M. Francherc) HED NO.: 2ES1-1119d) REVIEWED BY: D. J. Vakhinsky
(Westinghouse)e) DATE: 5/15/85[Signature]
(Essex)f) HED TITLE: Demarcation and Summary labeling
should be added to ESP.g) ITEMS INVOLVED: 2MSS * SOV 105 A,B,C,D,E,F

Item No's

107, 110, 109, 108T, 108, 111, 112, 111T

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

6.6.6.2

one pushbutton transfer covers three valves. Lines of demarcation should be present to enclose functionally related controls

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:


C. R. Surveys (R403)

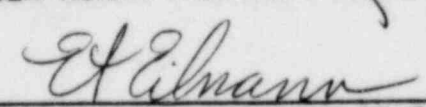
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

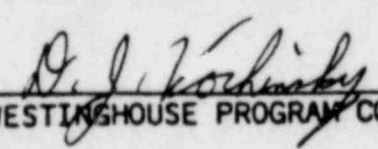
Operators action may be delayed

k) REVIEW AND RECOMMENDATIONS: The existing arrangement could be enhanced with demarcation lines as shown on attached page. Summary labeling should be added as appropriate. Demarcation is not practical in this case recommendation is AS suggested ~~above~~, on the attached.

↑
2
4/11


ESSEX HUMAN FACTORS PROJECT MANAGER

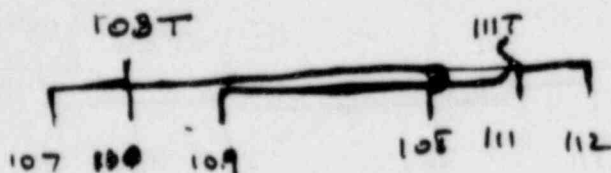

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

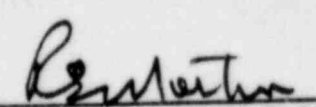
1) REVIEW AND DISPOSITION:

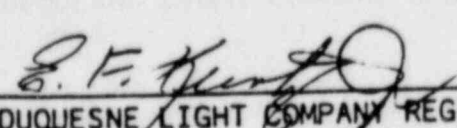
Agree

See clarification attached



Place Tags under Push buttons.

 10-1-85
DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 7.15.85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

CLARIFICATIONS TO HED No. 2ES1-1119

THE DEMARCATION LINES RECOMMENDED IN THE HED ARE INCORRECT. ITEM NO. 108T IS THE TRANSFER PUSHBUTTON FOR 2MSS & SOV 105 A, C AND D WHICH CORRESPONDS TO ITEMS 107, 109 AND 108 ON THE ESP. ITEM NO. 111T IS THE TRANSFER PUSHBUTTON FOR 2MSS & SOV 105 B, E & F WHICH CORRESPONDS TO ITEMS 110, 111 AND 112 ON THE ESP.

WITH THE ARRANGEMENT OF THESE DEVICES ON THE ESP THE USE OF DEMARCATION LINES IS IMPRACTICAL. RECOMMEND THAT NAMEPLATES BE ADDED FOR THESE TWO TRANSFER PUSHBUTTONS (ITEMS NO. 108T AND 111T) ~~LISTING~~ WHICH DEVICES ARE ASSOCIATED WITH THE PUSHBUTTONS.

EXAMPLE : " TRANSFER ^{CONTROL} ~~FOR~~ FOR
2MSS & SOV 105 A, C AND D "

NOTE SWEC WILL CORRECT DRAWING 12241-RE-25DE FOR THE DESCRIPTION OF ITEMS 108T AND 111T.

A. Jones 9-17-85

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS / 2
PLANT/UNIT

b) ORIGINATOR: J. Downing c) HED NO.: 2E++-1104

d) REVIEWED BY: W. J. Catullo e) DATE: 8/3/84
(Westinghouse)

T. [Signature]
(Essex)

f) HED TITLE: Labels not consistently placed
above components.

g) ITEMS INVOLVED: see attached sheet.

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

Labels not consistently placed above the
panel elements they describe.

6.6.2.1a

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Labels and Location Aids

DLCIN R403

TP 6.1 B3.9

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

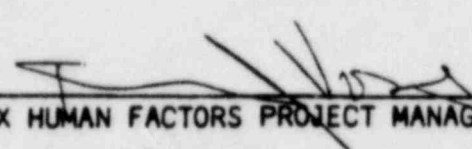
Delay in operation of correct control or
delay in observation of correct display
may result.

k) REVIEW AND RECOMMENDATIONS:

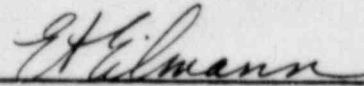
Determine the feasibility of
putting all labels above the appropriate
control or display.

See attached. The first 3 listed are ok.

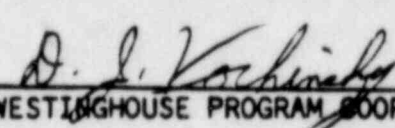
The rest should have labels above the described
component (if there is room) to avoid confusion.



ESSEX HUMAN FACTORS PROJECT MANAGER



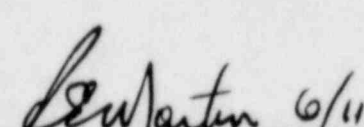
DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER



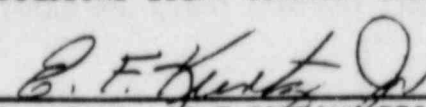
WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

OK



DUQUESNE LIGHT COMPANY ENGINEERING MANAGER



DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER



DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HED #

(continued)

OK	Diesel gen 2-1 speed indicator	(171A)	PnL BC4
	Diesel gen 2-2 speed indicator	(171B)	PnL BC4
	Rods out indicator	(318A)	PnL BB2
move label	Intermediate Range display	(378A)	PnL BB3
	Source Range display	(378B)	PnL BB3
	Four part flux indicator	(313)	PnL BB2
	Six part temp. indicator	(315)	PnL BB2
	Two part temp. indicator	(316)	PnL BB2
	one part speed indicator	(317)	PnL BB2
	Reactor Coolant pump status Lt Panel	(465)	PnL BA4
	Safeguards sys. status Lt Panel	(464)	PnL BA1
	Gen watts indicator	(307)	PnL BB1

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS - 2

PLANT/UNIT

b) ORIGINATOR: MADELINE RYABY

c) HED NO.: 28** - 2302

d) REVIEWED BY:

W. J. Catullo Jr
(Westinghouse)

e) DATE: OCT. 11, 1984

f) HED TITLE:

BY (Essex)
ENGRAVING WITHIN

A Legend ~~has~~ positioned so that top line of information
STATUS LIGHTS

is too high and difficult to read.

g) ITEMS INVOLVED: STATUS LIGHTS

LEGEND PUSHBUTTONS ON BENCHBOARD SECTIONS, ESPECIALLY,
VC6 + VC7.

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

PRINTED INFORMATION IS PLACED TOO HIGH ON LEGEND
LIGHTS SO THAT TOP LINE IS DIFFICULT TO READ
6.5.3.3a(2)

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

DISPLAYS SURVEY TP 5.1 B3 7

DLCIN R403


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

MISREADING LEGENDS OR DELAY IN READING LEGENDS

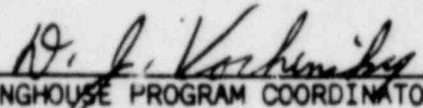
k) REVIEW AND RECOMMENDATIONS:

^{LIGHTS}
~~PUSHBUTTONS~~ SHOULD BE RE-LABELLED WITH WORDING
CENTERED WHICH SHOULD PROVIDE SPACE AT TOP AS WELL
AS BOTTOM. LABELS SHOULD BE NO MORE THAN
THREE LINES.

ok


ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

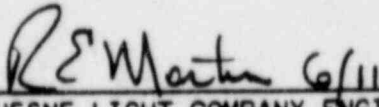
1) REVIEW AND DISPOSITION:

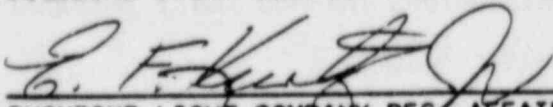
3 Line is not a guide of 0700.
lettering should be spaced in center with
emphasis on conveying information
approve

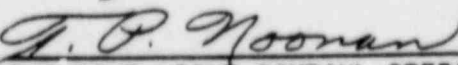
MINORITY OPINION:

Suggest disapproval
Status lights rarely
used

Rem


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 5-31-81
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) PVDC 2
PLANT/UNIT

b) ORIGINATOR: IDENTIFIED PART-2 c) HED NO.: 2BA4-2502

d) REVIEWED BY: *[Signature]* e) DATE: 8/10/84
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: MORE THAN FOUR DIGITS ON DRUM COUNTERS
WITHOUT USING GROUPING OR COMMAS

g) ITEMS INVOLVED:
DRUM COUNTERS ON PANEL:
BA-4(720, 991, 733, 992)

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:
DRUM COUNTER CONTAINS MORE THAN FOUR DIGITS WITH OUT
GROUPING OR SEPARATED BY COMMAS OR DECIMAL POINT.
6.5.5.1a(3)

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

DISPLAYS SURVEY TP 5.11 B3.51

DLCIN R403


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

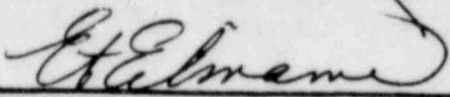
CAN RESULT IN A DELAY OR INCORRECT READING
OF THE DRUM COUNTER

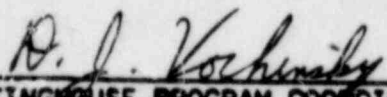
k) REVIEW AND RECOMMENDATIONS:

GROUP THE DIGITS ON THE DRUM COUNTER
BY COMMAS, DECIMAL POINTS, OR ADDITIONAL
SPACES OK

SEE UNIT #1 HED 416


ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER



WESTINGHOUSE PROGRAM COORDINATOR

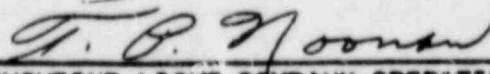
1) REVIEW AND DISPOSITION:

Resolution to be consistent w/ UNIT #1
Labeling study

7/21/85 - RT strongly agrees
that ~~X~~ drum counters need
to have decimals, commas, or
additional spaces as necessary
For both Unit 1 & 2, therefore
keeping them consistent.


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

CLARIFICATIONS TO HED. NO. ZBA4-2502

THE NAMEPLATE LIST (DATED 11-30-83) HAS ITEM 992 LISTED AS:

" BORIC ACID TO BLENDER
TOTAL MAKEUP FLOW
ZCHS-FQ168 "

DELETE THE WORD "TO" IN THE FIRST LINE. TOTAL MAKEUP FLOW
FROM THE "BORIC ACID BLENDER" IS BEING MEASURED.

AS A RELATED ITEM, ITEM 855 IS LISTED IN THE NAMEPLATE LIST AS:

" BORIC ACID TO
BLEND SYSTEM
ZCHS-FR113 "

THIS RECORDER HAS TWO INPUTS. ONE IS FOR BORIC ACID FLOW TO THE BLENDER.
THE OTHER IS FOR ~~FROM~~ MAKEUP FLOW FROM THE BLENDER. THE PRESENT
TITLE IS THEREFORE NOT ENTIRELY ACURATE. AN ALTERNATIVE NAMEPLATE
COULD BE:

" BORIC ACID BLENDER
ZCHS-FR113 "

WITH THE PEN IDENTIFICATION ON THE FACE OF THE RECORDER SIMILAR
TO:

- BORIC ACID TO BLENDER
- MAKEUP FROM BLENDER

D. Gues 10-3-85

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2ES*-1118

d) REVIEWED BY: D. J. Vachinsky e) DATE: 5/9/85
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: Temporary labels are not placed
above the panel element(s) they describe

g) ITEMS INVOLVED: Emergency Shutdown Panel
- all components

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.6.2.1 a.
labels should be placed above the panel element(s)
they describe.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Labels Survey

DLCIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

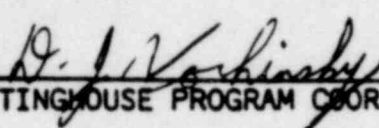
An Operator may not be able to read a label
when his hand is on the control.

k) REVIEW AND RECOMMENDATIONS: When permanent labelling is affixed, the labels should be placed ^{or} ~~ade~~ above the panel element(s) they describe.

As suggest for 12 (number) (element),


ESSEX HUMAN FACTORS PROJECT MANAGER

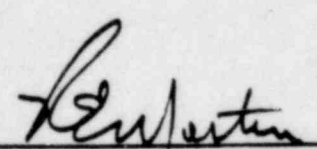

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

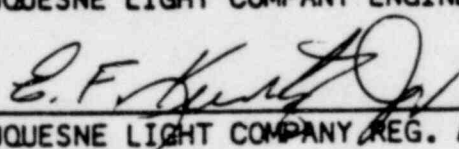

WESTINGHOUSE PROGRAM COORDINATOR

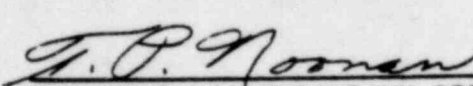
1) REVIEW AND DISPOSITION:

Agree

Install perm. labels above element.

 10-1-85
DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 7-15-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

CLARIFICATIONS TO HED NO. CES# - 1118

THE ESP FRONT VIEW DRAWINGS (SWEC DRAWING 12241-RE-25DE, -25DF, -25DG AND -25DH) SHOW THAT NAMEPLATES ARE DESIGNED TO BE ABOVE THE CONTROL DEVICES. THE TEMPORARY LABELS PLACED ON THE ESP BY FIELD PERSONNEL DO NOT CORRESPOND TO THE DRAWING NAMEPLATE LOCATIONS.

THE PERMANENT NAMEPLATES WILL BE ABOVE THE PANEL DEVICES.

D. Lyne 9-16-85

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS - 2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2ESX-11.0

d) REVIEWED BY: D. J. Vorkhinsky e) DATE: 5/14/85
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: Nameplates are identical for
different controls.

g) ITEMS INVOLVED: 2RHS*MOV 702A-

2RHS*MOV 701B-

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.6.3.6

The nameplates are identical, a means of coding should be used to reduce the probability of selecting the wrong control.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

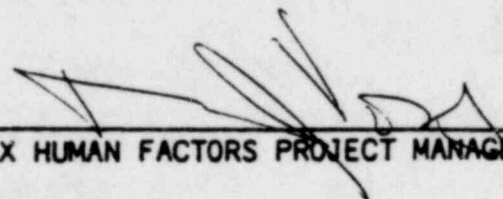
Control Room Survey (R403)

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

An operator may select the wrong control.

k) REVIEW AND RECOMMENDATIONS: The nameplates should be changed such that they will be distinguishable from one another.

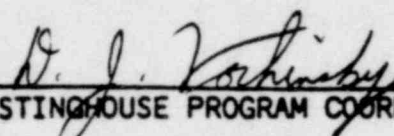
Suggested to change the nameplates so that they are distinguishable from one another.



ESSEX HUMAN FACTORS PROJECT MANAGER



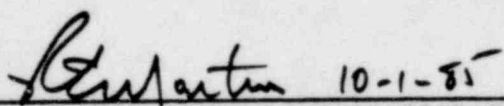
DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER



WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

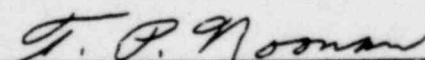
Agree

 10-1-85

DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 7-26-85

DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER



DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

CLARIFICATIONS TO HED No. RESX-1120

THE PRELIMINARY "NAMEPLATE ENGRAVING LIST" DATED 11-30-83 CONTAINS A PROPOSED FORMAT AND COLOR CODING SCHEME FOR NAMEPLATES ON THE MAIN CONTROL BOARD, EMERGENCY SHUTDOWN PANEL AND ALTERNATE SHUTDOWN PANEL. THE CONTROL ROOM REVIEW TEAM SHOULD ADDRESS THESE PROPOSALS ON A GENERIC BASIS AND WITH BV-1 SHOULD AGREE ON A SPECIFIC FORMAT FOR COLOR CODING AND LABELLING OF NAMEPLATES.

THE PROPOSED NAMEPLATES FOR 2RHS#MOV702A AND 2RHS#MOV701B (TWO EACH) ON THE ESP, AS LISTED IN THE "NAMEPLATE ENGRAVING LIST", WOULD BE COLOR CODED ~~TO~~ TO REFLECT THE POWER SOURCE USED (I.E. ORANGE OR PURPLE) AND WOULD INCLUDE THE SPECIFIC MOTOR CONTROL CENTER FROM WHICH POWER IS SUPPLIED.

THE COMMENTS INCLUDED IN THIS HED FOR 2RHS#MOV702A AND 2RHS#MOV701B ~~W~~ ALSO APPLY TO ANY OTHER EQUIPMENT WHICH IS CAPABLE^{LE} OF BEING POWERED FROM EITHER THE ORANGE OR PURPLE TRAINS AND HAS CONTROL DEVICES ON THE MCB OR ESP.

D. Gues 9-17-85

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS 2
PLANT/UNIT

b) ORIGINATOR: N. KFOUR Y

c) HED NO.: 2VXX-1112

d) REVIEWED BY: M. J. Catullo Jr
(Westinghouse)

e) DATE: 7/31/84

T. J. [Signature]
(Essex)

f) HED TITLE: INCONSISTENCY OF ANNUNCIATOR TILE ABBREVIATIONS
AND ACRONYMS

g) ITEMS INVOLVED: SEE ATTACHED LIST for samples

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

ANNUNCIATOR TILE ABBREVIATIONS AND ACRONYMS ARE
NOT CONSISTENT WITH APPROVED LIST AND WITH THOSE
USED ELSEWHERE IN THE CONTROL ROOM. 6633 a.


i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER: CONVENTIONS SURVEY TP-81-87-1. DLCIN R403

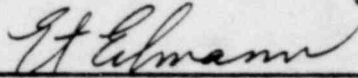
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

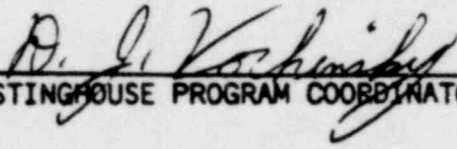
MAY CAUSE DELAYS AND/OR ERRORS IN OPERATOR RESPONSE.

k) REVIEW AND RECOMMENDATIONS:

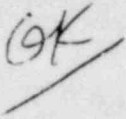
- 1) RE-EVALUATE INCONSISTENT LABELS TO CONFORM TO THE APPROVED LIST OF TERMS, ABBREVIATIONS AND ACRONYMS.
- 2) MAINTAIN ADMINISTRATIVE CONTROL OF APPROVED LIST.
- 3) Change "Secondary" to "Turbine Plant" on tiles A6-3A & 3B.

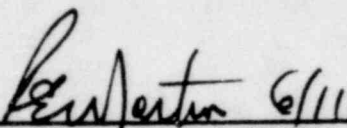

ESSEX HUMAN FACTORS PROJECT MANAGER

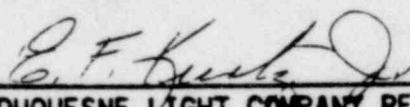

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:




DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

INCORRECT ABBREVIATIONS

ANN # 1%

ON ANNUNCIATOR	ON-LIST	LOCATION
FD WTR	FW	ANN A5
STM GEN	SG	ANN A6

STM GEN A
LEVEL
LOW - LOW
REACTOR TRIP

SG A LOW LEVEL/
LOOP A FD WTR
FLOW LOW
REACTOR TRIP

LOCATION

ANN A5

STM GEN B
LEVEL
LOW / LOW
REACTOR TRIP

SG B LOW / LEVEL
LOOP B FD WTR

ANN A5

ABBREVIATIONS AND FULL WORDS

LOCATION

LOOP
OVERTEMPERATURE
AT

LOOP
OVERTEMP AT
AUTO-TURB RNBK
BLOCK ROD W/D

ANN A4

TURB BLDG
MAIN STEAM PIPE
CHASE DEWGE
VALVE OPERATION

TURB BLDG MAIN
STEAM PIPE CHASE
FIRE PROT
SYSTEM TROUBLE

ANN 10

NOT ON LIST

RNBK ANN A4
APUMS ANN A4
PROT ANN A9, A10.

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2VA9-2406

d) REVIEWED BY: D. J. Kuchinsky e) DATE: 5/6/85
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: Displays for same parameter are not compatible

g) ITEMS INVOLVED: RCP lower bearing temperature
2 RCS - TR 448 A, B

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.5.1.5 d., 6.5.4.2 b.

When two displays of the same parameter must be compared, scales should be compatible in numerical progression and ^{MF} ~~scale~~ scale organization. The scales are, for: 448 A = 50 - 300°F

Also, recorders are not reliable, points of temperature print over one another. for 448 B = 0 - 300°F

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Verification of Task Performance Capabilities
- Suitability (R405)

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:


May result in operator misreadings
and/or delay of response

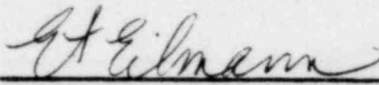
k) REVIEW AND RECOMMENDATIONS:


Change scales so that they are compatible.

Scales are correct. Recorders are multi-point. One records motor temps, the other bearing temps. Supplemental labels should be added identifying points and thereby differentiating recorders.

Also, suggest adding points to process computer or frequent maintenance and repair of recorder print heads


ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

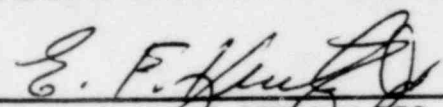

WESTINGHOUSE PROGRAM COORDINATOR

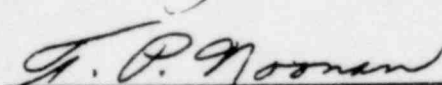
1) REVIEW AND DISPOSITION:

Proper labeling needs to differentiate points
of Recorders

7/29/85 - RT Agrees w/ above


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

CLARIFICATIONS TO HED 2VA9-2406

2RCS-TR448A RECORDS VARIOUS TEMPERATURES FOR EACH RCP. THESE SIGNALS ARE FROM RTDs. THE VARIABLES MONITORED FOR EACH RCP ARE:

- A. PUMP LOWER BEARING TEMPERATURE
- B. NO.1 SEAL WATER LEAKOFF TEMPERATURE
- C. MOTOR STATOR WINDING TEMPERATURE

2RCS-TR448B RECORDS MOTOR BEARING TEMPERATURES FOR EACH RCP. THESE SIGNALS ARE FROM THERMOCOUPLES. THE VARIABLES MONITORED FOR EACH RCP ARE:

- A. UPPER THRUST BEARING
- B. LOWER THRUST BEARING
- C. UPPER RADIAL BEARING
- D. LOWER RADIAL BEARING

ALL THESE VARIABLES ARE ALREADY INPUT TO THE PROCESS COMPUTER. THE COMPUTER POINTS HAVE THEIR OWN RTD AND THERMOCOUPLE DETECTORS AT THE RCPs.

THE TWO RECORDERS PROVIDE DIFFERENT INFORMATION AND NO COMPARISON BETWEEN SCALES IS REQUIRED. PRESENTLY, NO LABELLING EXISTS ON THE VERTICAL BOARD FOR THESE RECORDERS. THIS WILL BE ADDED LATER FOR THE IDENTIFICATION OF INDIVIDUAL RECORDER POINTS.

RECOMMENDED MAINTENANCE ON RECORDERS PER MANUFACTURER INSTRUCTIONS SHOULD BE KEPT RECORDERS IN ~~RELIABLE~~ ~~GOOD~~ ~~WORKING~~ RELIABLE CONDITION. CHECK WITH BV-1 ON TYPE AND FREQUENCY OF ANY PROBLEMS ENCOUNTERED.

D. Jones 9-13-85

a) BVPS - 2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 28B12215

d) REVIEWED BY: D. J. Kochinsky e) DATE: 1/30/85
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: Related indicator meters out of order

g) ITEMS INVOLVED: Pressurizer level RCS-LI 459A, 461, 460
I III II

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: The arrangement of displays are not logical. The three related displays are ^{NOT} in ~~the~~_{MF} numeric sequence (6.2.2)

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER: Verification of Task Performance Capabilities; Suitability (R405) 6.2.1.2

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

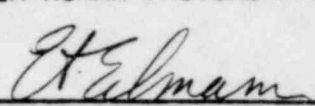
Operators response may be delayed.
or wrong meter may be read
(indicator)

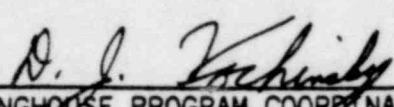
K) REVIEW AND RECOMMENDATIONS:

these level indicators be rearranged in order if possible.

NOTE: if not possible (due to violating separation criteria) then Pressurizer level recorder switch (Item 324) should be changed to match order of indicators. i.e., indicators proceed from ~~left~~ ^{right} to ~~right~~ ^{left} channel I - III - II; selector switch ^{for recorder} is I - II - III, change to I III II.


ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

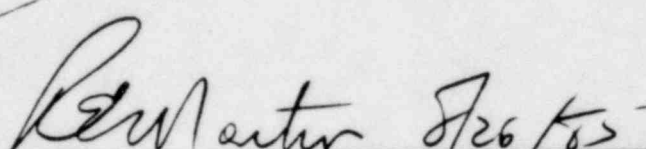

WESTINGHOUSE PROGRAM COORDINATOR

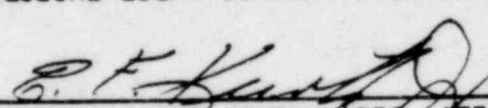
1) REVIEW AND DISPOSITION:

Item No. 325 which now reads:
Change label on "PZR LEVEL Recorder Channel selector" to ~~RT level control~~
No other action, Item 324 is OK.

7/29/85 - RT recommends
new label read:

PZR LEVEL INDICATOR
CHANNEL SELECTOR


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

P

PROCEDURE CHANGE REQUIRED

a) BVPS/2
PLANT/UNIT

b) ORIGINATOR: D. J. VOCHINSKY c) HED NO.: 2***-3006

d) REVIEWED BY: D. J. Vochinsky e) DATE: 1/23/85
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: MISSING CONTAINMENT INSTRUMENT AIR DRYER
SWITCH

g) ITEMS INVOLVED:
CONTAINMENT INSTRUMENT AIR DRYER START/STOP SWITCH
(2IAC-DRY21)

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:
A CONTAINMENT INSTRUMENT AIR DRYER START/STOP SWITCH
DOES NOT EXIST ON THE MAIN CONTROL BOARD

3.7.2.1

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

VERIFICATION OF AVAILABILITY, R405, 6.2.1.1


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

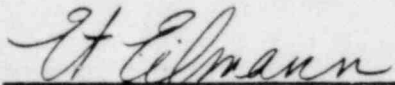
DEVICE DOES NOT EXIST ON THE MAIN CONTROL BOARD
TO PROVIDE THE CONTROL NECESSARY TO IMPLEMENT THE
FOLLOWING OPERATOR TASKS: E-0, 38; ES-1.1, 5; E-3, 11.

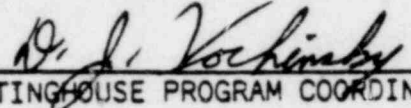
k) REVIEW AND RECOMMENDATIONS:

PROVIDE A CONTAINMENT INSTRUMENT AIR DRYER SWITCH
ON THE MAIN CONTROL BOARD.

It is possible to get instrument air to the containment
without the air dryer being on. Air Dryer switch
is available on a local panel. Procedure will be
modified to say "local panel".

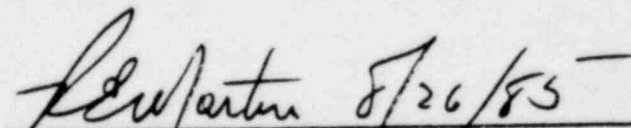

ESSEX HUMAN FACTORS PROJECT MANAGER

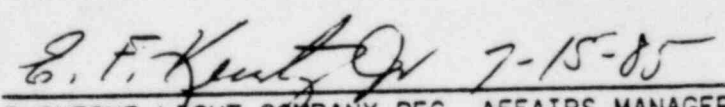

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Agree No expt. chgs. req'd.

 8/26/85
DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 7-15-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: M. Francher

c) HED NO.: 2ABX-3207

d) REVIEWED BY: J. J. Kochinsky
(Westinghouse)

e) DATE: 5/15/85

[Signature]
(Essex)

f) HED TITLE: Control switches for pumps
are missing targets.

g) ITEMS INVOLVED:

All pump control switches on ASP

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.5.1.1 b. 6.4.1.1 a.

The current pump switches do not have targets, which the procedures ask for.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

C.R. Surveys (R403)

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Operator may incorrectly adjust the pump control switch or his action may be delayed.

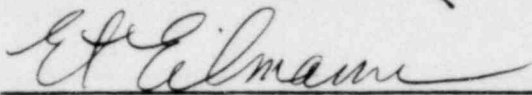
k) REVIEW AND RECOMMENDATIONS: Ensure that both procedures and equipment are in agreement with each other by either 1) Providing pump switches with targets

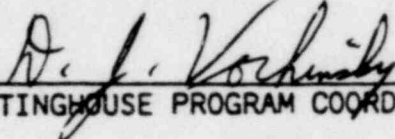
or -

2) changing procedures to agree with available equipment. Suggest determining if switch targets are required and to provide targets or modify procedure as appropriate.

• New procedure will omit reference to targets, switches are OK.


ESSEX HUMAN FACTORS PROJECT MANAGER

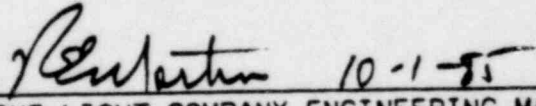

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

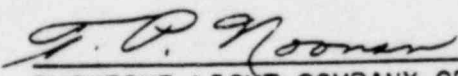
1) REVIEW AND DISPOSITION:

Agree

Change procedure only.

 10-1-85
DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 7.26.85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVP-2
PLANT/UNIT

6

b) ORIGINATOR: M. Francher c) HED NO.: DB-3206

d) REVIEWED BY: D. C. Vorkensky
(Westinghouse) e) DATE: 1/30/85

I. J. Vorkensky
(Essex)

f) HED TITLE: Switch positions missing on
controllers

g) ITEMS INVOLVED: 2BDG*ACV 10CA1, B1, C1
SC1 Blowdown Isolation valves

4KV ACB 42A, 142A, 242^B, 342^B

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.4.1.1 a. (1)

Controls are not adequate for the functions they perform, they do not provide a sufficient range of control.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Verification of task performance capabilities, suitability (R405) 6.2.1.2


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

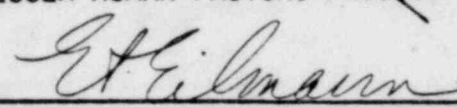
Operator may adjust control incorrectly.

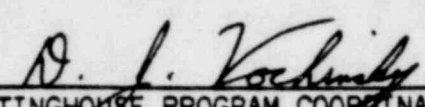
k) REVIEW AND RECOMMENDATIONS:

~~are required to have a "pull to lock" position. The "pull to lock" components should be replaced with "pull to lock" type components.~~
The 4KV ACBS have no "pull to lock" position on the component. These should be replaced with "pull to lock" type components.

SEE ATTACHED

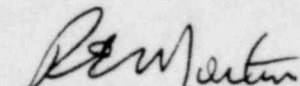

ESSEX HUMAN FACTORS PROJECT MANAGER

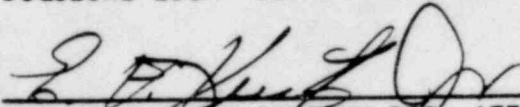

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

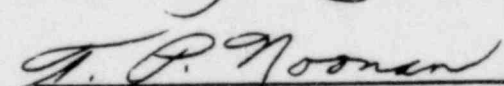

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

No plant changes required - procedures to be investigated. No within DEADR scope


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

- Throttling of S/G Blowdown is done locally, procedure should clarify this.
- 4KV ACB 42A, 142A, 242B, 342B do not require "pull-to-lock", procedure (E-1, ATTACH. 1) should be changed.

a) BVPS-2
PLANT/UNITb) ORIGINATOR: M. Francher c) HED NO.: 2BA*30/4d) REVIEWED BY: D. L. Vachinsky e) DATE: 3/19/85
(Westinghouse)[Signature]
(Essex)f) HED TITLE: Valve controllers cannot be
set for a pressure setpointg) ITEMS INVOLVED: Atmospheric Steam dump valve controllers
[2 HSS * PK101A, B, C]h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.4.1.1 a(1)(2)

This control is not adequate for the function it is supposed to perform. It can be set for "percent open" but a PSIG value cannot be set on controller.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Validation of Control Room Functions (R406)

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Operator may respond incorrectly

k) REVIEW AND RECOMMENDATIONS: Currently, to monitor (control) pressure requires an operator to be present full time.

The controllers should be exchanged for controllers that allow the operator to dial in a pressure and set to auto maintain.

RT review: Stone + Webster is review further. They believe controllers can be set for a specific pressure value. Recommend that S+W verify way in which controllers work. Also recommend label plates be added which correlate pressure to setpoint setting. If controllers cannot be set to maintain a specific pressure value, above recommendation for exchanging controller should be considered.

Procedure will be reworded to delete implication that valves can be set to a specific pressure setpoint.

R. Woods
ESSEX HUMAN FACTORS PROJECT MANAGER

J. Hilman
DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

D. J. Vochinsky
WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Agree; procedure clarification

The review team continues to recommend that the controllers be exchanged for controllers that allow the operator to dial in a pressure set point. In addition to present controllers not providing auto pressure control, the controllers are located on Benchhead Section A2/A3 and pressure indicators are on Vertical section C6.

7-29-85

W. Martin 10-25-85
DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

E. E. Smith 7-26-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER

T. P. Noonan
DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

CLARIFICATIONS TO HED 2BA*-3014

THE CONTROLLERS FOR THE ATMOSPHERIC STEAM DUMP VALVES DO ALLOW AN OPERATOR TO SET AND MAINTAIN A PRESSURE WHEN THE CONTROLLER IS PLACED IN AUTOMATIC. SEE ATTACHMENT 2 FOR EXPLANATION OF CONTROLLER OPERATION. TO OBTAIN A DIRECT READING OF THE PRESSURE SETPOINT SELECTED, ~~IN~~ A SUPPLEMENTAL SCALE GRADUATED IN PSIG COULD BE PLACED NEXT TO THE SETPOINT SCALE (GRADUATED IN 0 TO 100%) OF THE CONTROLLER, IF DESIRED.

THERE ARE PRESSURE INDICATORS FOR "ATMOSPHERIC STEAM DUMP STEAM GENERATOR PRESSURE" ON THE VERTICAL BOARD SECTION A6 DIRECTLY ~~IN~~ BEHIND THE ATMOSPHERIC STEAM DUMP VALVE CONTROLLERS. THE PRESSURE INDICATORS ARE ITEMS 879 A, B & C ON SWEC DRAWING 12241-RE-25B WITH MARK NUMBERS 2MSS-PI 101 A, B & C. THESE INDICATORS ARE ~~NOT~~ NOT CLASS 1E, BUT THEY DO RECEIVE THEIR SIGNAL FROM THE SAME CLASS 1E PRESSURE TRANSMITTERS THAT ^{FEED} THE ATMOSPHERIC STEAM DUMP VALVE CONTROLLERS. THE PRESSURE INDICATORS ~~ARE~~ LOCATED ON VERTICAL BOARD SECTION C6 ^{REFERENCED IN THE HED} ARE CLASS 1E POST ACCIDENT MONITORING INSTRUMENTS WHICH ARE FED THEIR SIGNALS FROM A DIFFERENT SET OF CLASS 1E PRESSURE TRANSMITTERS.

D. Gues 9-23-85

ATTACHMENT 2 TO HED 2BAM-3014

2MSS*PT101A,B,C provide individual 4-20ma signals to the process cabinets. There, the 4-20ma signal is converted to a corresponding 0-10VDC signal, by the loop power supply card, for use internally within the process cabinets. Additionally, the setpoint driver card continuously generates a 0-10VDC setpoint signal and adjusts it's output when it receives a digital increase/decrease signal from the remote M/A station. The controller card receives both the process signal and the setpoint signal, compares them, and generates a control signal output to the output driver card. The output driver card, in turn, converts the 0-10VDC control signal to a 4-20ma control signal which is the output from the process cabinets to the control valve. In this case 2SVS*PCV101A,B,C

The important point in all this, is that since the controller card compares the setpoint to the process signal, and not to valve position, the setpoint is defined as the control point expressed as a percentage of the overall process range (ie. When you adjust the setpoint you are not adjusting valve position, you are adjusting at what percentage of the transmitter ^{Calibrated} range you want the pressure to be controlled at.)

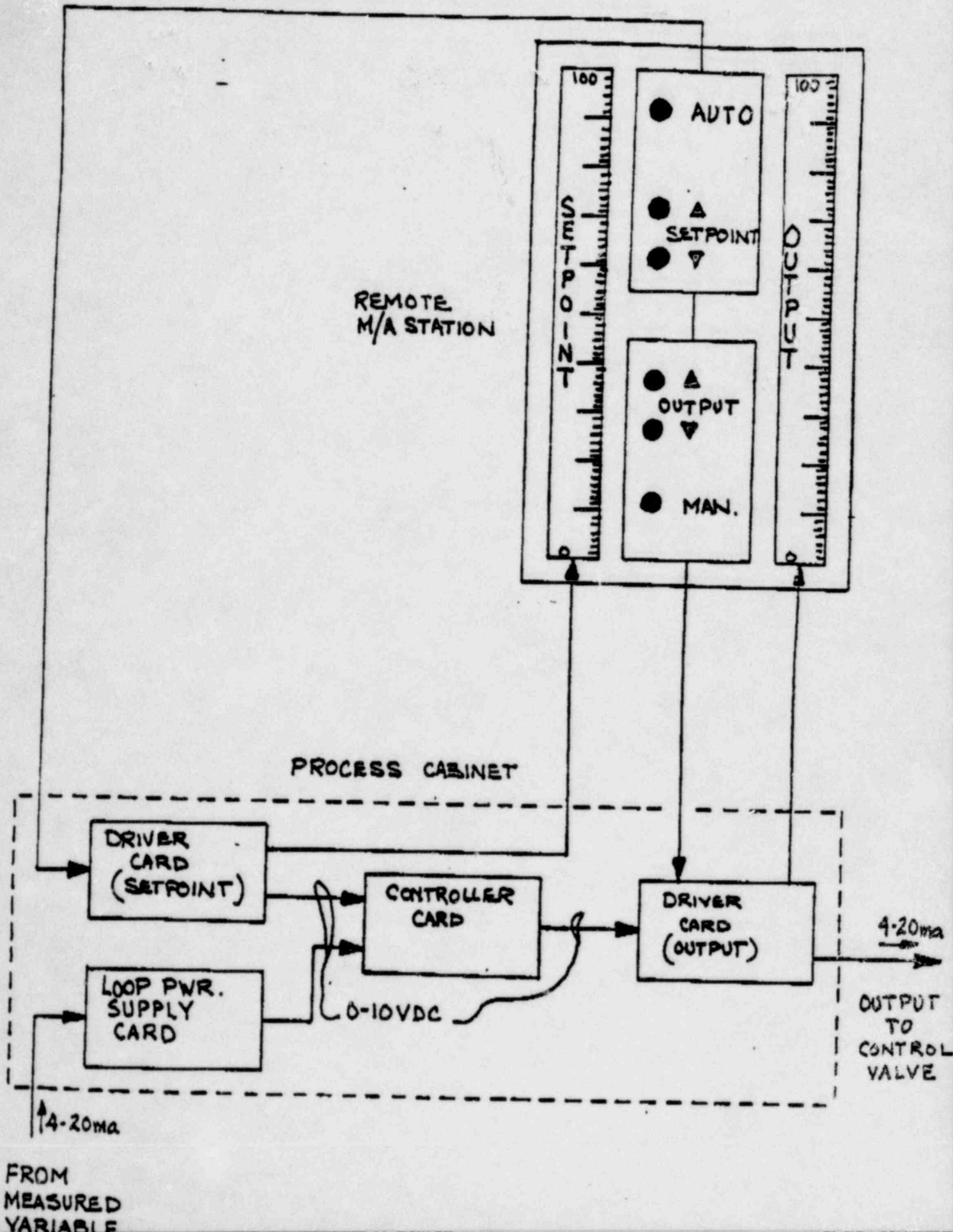
* note: although the setpoint, as indicated on the M/A station, is not expressed in process units (ie. PSIG) it can easily be determined as shown below:

Example:

Transmitter range \rightarrow 0-1500 PSIG

Setpoint \rightarrow 55%

Control point $\rightarrow (.55) \times (1500 \text{ PSIG}) = 825 \text{ PSIG}$



HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) SVPS-2
PLANT/UNIT

18

b) ORIGINATOR: M. Francher c) HED NO.: 2844-32 ⁰⁵~~06~~

d) REVIEWED BY: R. J. Vorkinsky
(Westinghouse) e) DATE: 1/28/85

J. Essex
(Essex)

f) HED TITLE: Speed Selection is missing from control

g) ITEMS INVOLVED:

2 CHS * P22A, 22B Boric Acid Txfr Pumps

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

6.4.1.1 a(1) The above control is not adequate for the function it performs. It does not provide a sufficient range of control.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Verification of Task Performance Capabilities
Suitability (R405), & Validation (R406)

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:


Operator may adjust control incorrectly

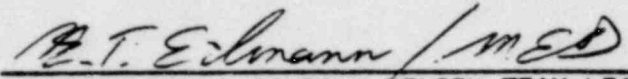
k) REVIEW AND RECOMMENDATIONS: (MAIN CONTROL BOARD)

~~Control should be replaced by~~

~~variable speed motor~~

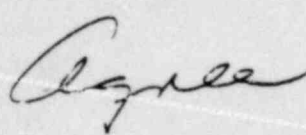
Upon further investigation we found that Burn And Transfer Pumps ^{on UNIT 2} are not variable speed, therefore procedure will be revised to eliminate reference to "fast" speed.

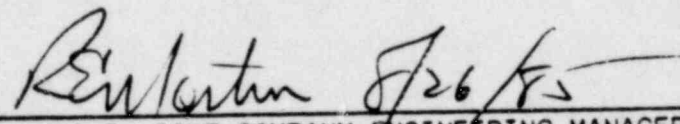

ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

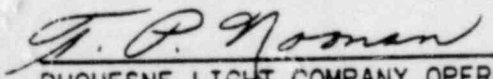

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

 No Change req'd


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 7-15-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2ES2-3208

d) REVIEWED BY: A. J. Vorhies
(Westinghouse) e) DATE: 5/15/85

[Signature]
(Essex)

f) HED TITLE: Pump control switch does not
provide speed selection. (see HED No. 2BA4-3205)

g) ITEMS INVOLVED:

2CHS * P22A, 22B Boric acid Transfer Pumps

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.4.1.1a (1)

The above control is not adequate for the function it performs. It does not provide a sufficient range of control.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

C.R. Surveys (R403)

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Operator may adjust control incorrectly

k) REVIEW AND RECOMMENDATIONS:

(EMERGENCY SHUTDOWN PANEL)

~~see attached~~

Control Function and procedure should agree.
That is if pumps have two speeds, a fast speed
and a slow speed. The pumps are not put
in a slow speed mode on the fast speed test.
The test is done at 1150 RPM. Each.

RT: Pumps are single speed, there "Fast"
should be deleted from procedure.

do not

ESSEX HUMAN FACTORS PROJECT MANAGER

E. Elman

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

D. J. Vochin

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Agree

No change req'd

R. M. Minter 8/26/85

DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

E. F. Kuntz 7-15-85

DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER

T. P. Moran

DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2VC6-2218

d) REVIEWED BY: G. J. Vochinsky e) DATE: 3/25/85
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: Setpoint cannot be read at low
(Sp Root)
end of logarithmic scale

g) ITEMS INVOLVED: Aux Feed Flow indicators
[2FWE x FI 100B, 100C2]
also FI-100A
FI-100A2, B2, & C2

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.5.1.2 a.
Scale selection - scale units are not consistent
with the degree of precision and accuracy needed
by the operator.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:
Validation of Control Room Functions (R406)^{MP}

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Operator may respond incorrectly

k) REVIEW AND RECOMMENDATIONS:

There is only one demarcation line between 0 and 100 gpm. This mark cannot be assumed to be 50 gpm. since the scale is logarithmic. It has already been recommended that procedure should be changed to "maintain feed flow of 100 gpm" (EOP validation). In addition scale should be modified to a ^{top}nonlinear 0-~~100~~ gpm scale or a narrow range indicator should be installed.

Review team recommends as ~~per~~ above.

modifying procedure to read "maintain feed flow of 100 gpm" is sufficient to resolve this HED. ~~OSUG~~ OSUG has agreed to modify procedure.

T. Wood
ESSEX HUMAN FACTORS PROJECT MANAGER

C. Helman
DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

R. J. Vochinsky
WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Agree
Disagree Rev

See D. Squel's
Comments

R. W. Smith 11-12-85
DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

E. F. Kuntz 11-17-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER

J. P. Noonan
DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

CLARIFICATIONS TO HED NO. 2VCG-2218

THE REFERENCES TO "LOGRITHMIC" SCALES IN THE HED SHOULD READ " SQUARE ROOT" SCALES.

BASED UPON THE STATEMENT IN THE "REVIEW AND RECOMMENDATIONS" SECTION OF THE HED THAT OSUG HAS AGREED TO MODIFY THE EOP TO MAINTAIN A FEED FLOW OF 100 GPM, THE SQUARE ROOT INDICATORS WITH A 0 - 400 GPM RANGE ARE ADEQUATE.

AGREE THAT A LINEAR SCALE (0-400GPM) OR A NARROW RANGE SCALE IS NOT NECESSARY, BASED UPON ABOVE STATEMENTS.

D. Jones 10-31-85

NOTE:

NEW AUX. FEED FLOW INDICATORS HAVE BEEN INSTALLED IN THE CONTROL ROOM. THEY READ 0-400 GPM ON A LINEAR SCALE AT INCREMENTS OF 10 GPM. THEREFORE ANY READING ABOVE 20 GPM THAT IS A MULTIPLE OF 5 CAN BE READ ON THESE INDICATORS.

M. Deffin 11/19/85

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: - M. Francher c) HED NO.: 2XXX - 3018

d) REVIEWED BY: D. J. Kochinsky
(Westinghouse) e) DATE: 5/6/85

T. Vora
(Essex)

f) HED TITLE: Position labels not consistent with
terms used in element tables

g) ITEMS INVOLVED: see attached list

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.4.1.1 a / 6.5.1.4 e.

The position labels on the controls listed are not the same as the position terms given in the element tables

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER: Verification of Task Performance Capabilities
- Suitability (R405)

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Operators actions may be delayed
or may choose wrong position.

K) REVIEW AND RECOMMENDATIONS: of concern on this list are:

- 1) Are Standby and Auto the same in meaning for LHSI pumps
- 2) Is there a need for a Standby position with the Diesel Generator
(This is an automatic function in the Diesel Generator)

Although the other terms differ, the meanings are the same.
Examples: Trip vs Stop; Open vs Trip (breakers); Run vs Start.
For these, it should be ensured that the procedures agree with the board labeling.

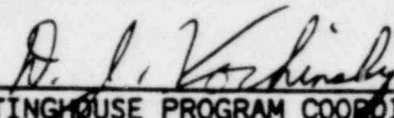
As per above,



ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER



WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Procedures will use same nomenclature
to assure labels agree w/procedure

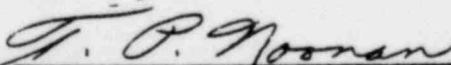
Change procedure words
leave labels as is.

 10-1-85

DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 7-15-85

DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER



DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

Information or Control Requirement	Required	Actual	MCB Location	
Main Generator Output Breaker PCB-352; 362	Open, Closed	Trip; Closed	C3	
Main Generator Excitation Breaker ACB-41	Open; Close	Trip; close	C3	
FW pumps 2FWS-P21A,B	Trip	stop	C1	
LHSI pump switches ^{2SIS*} P21A,B	Stop/Standby	stop/start/Auto	A2	
Bus 2AE supply breaker ACB- 2A10 ^{2A10} , 2E7	open; closed	Trip; closed	C3, C4	
Bus 2DF supply breaker ACB-2D10, 2F7	open; closed	Trip; closed	C3, C4	
Controls to restore offsite power	open; close	(Breakers) Trip; close	C3/C8	
iesel generator output breakers 2E10; 2F10	open; close	Trip/close/ Pull to Lock	C3/C4	
Charging/HHSI pumps 2CHS*P21A,B,C	run / stop	start/Auto/stop	A4	

Information or Control Requirement	Required	Actual	MCB Location
RCP Switches 2RCS - P21 A, B, C	Trip	Stop/Auto/start	A4
Make up Stop valve switch	Open/Close	stop/start	A4
Make up Control switch	Open/Close	stop/start	A4
Controls/Switches for Diesel Generators	stand by, run, stop	start pushbutton stop pushbutton	e3, C4
Breaker Switches to supply offsite power to Emer. busses	open/close	Trip/close	
Boric Acid Makeup valve position	open/close	start/stop	A4
Reactor coolant makeup controls	open/close	start/stop	

NO CHANGE REQUIRED

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2CIC-0301

d) REVIEWED BY: D. J. Vorkindy e) DATE: 3/26/85
(Westinghouse)

T. Wood
(Essex)

f) HED TITLE: Keyboard slope is less than minimum limit

g) ITEMS INVOLVED: Process Computer Keyboard

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.7.1.4 g.
Keyboard slope is approximately 12.5° from horizontal
Guideline limits allow between 15 and 20 degrees

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER: Control Room Surveys (R403)
Computer Systems TP 7.1 B1-2

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

With increased time, errors and fatigue
will occur.

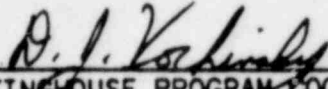
k) REVIEW AND RECOMMENDATIONS: Replace existing keyboard with one that has a keyboard slope within the 15-20 degrees boundary

RT recognizes above discrepancy but justifies no action since the operators are not expected to spend any long periods of time at the keyboard.

• NO ACTION

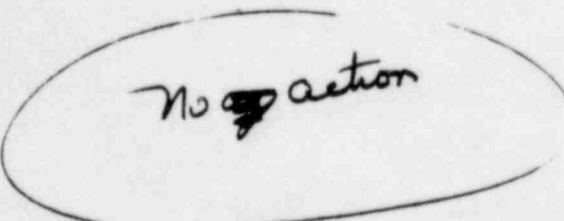

ESSEX HUMAN FACTORS PROJECT MANAGER

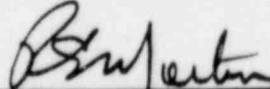

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

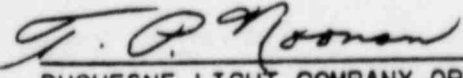
1) REVIEW AND DISPOSITION:

RT agree 12/9/85




DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 6-21-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BIPS-2
PLANT/UNIT

b) ORIGINATOR: N. KFOURY

c) HED NO.: 2***-1102

d) REVIEWED BY: M. J. [Signature]
(Westinghouse)

e) DATE: 11/8/84

[Signature]
(Essex)

f) HED TITLE: "A" SI ACCUMULATOR DRAINED BELOW THE T.S. MINIMUM

g) ITEMS INVOLVED:

"A" SI ACCUMULATOR TEST VALVE ON DISCHARGE LINE

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 46.1.1

"A" SI ACCUMULATOR WAS DRAINED TO A LEVEL BELOW THE T.S. MINIMUM AS A RESULT OF AN OPERATOR OPENING A TEST VALVE ON A DISCHARGE LINE.

Controls, displays, and other equipment items that must be located, identified or manipulated should be appropriately and clearly labeled to permit rapid and accurate human performance.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER: LER 280-82072

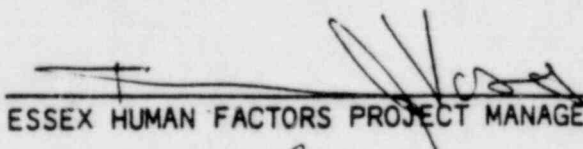
LER Review DLC IN R401A

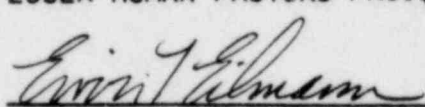
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

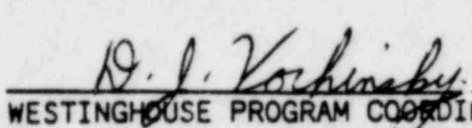
OPERATOR ERROR RESULTED IN THE TEST VALVE BEING OPENED [ERROR OF COMMISSION]

k) REVIEW AND RECOMMENDATIONS:

- ~~Implement~~ LABELING AS PER NUREG-0700 GUIDELINE 6.6.1.1
 - Addressed in labeling scheme (REF. HED's 2***-1101, 1103)
- No Action specific to this HED.

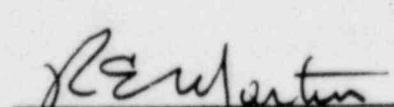

ESSEX HUMAN FACTORS PROJECT MANAGER

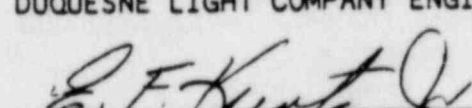

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

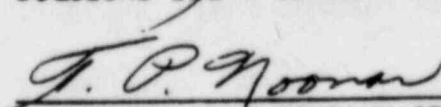

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

OK No action


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS / 2
PLANT/UNIT

b) ORIGINATOR: J. Downing c) HED NO.: 2XXX-1106

d) REVIEWED BY: W. J. Catullo Jr. e) DATE: 2/3/84
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: Dark characters not provided on
light background to prevent loss of readability due
to dirt.

g) ITEMS INVOLVED:
All component labels

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

To prevent loss of readability because of dirt,
dark characters should be provided on
a light background. The labeling does not comply
with this paragraph.

1) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

DLCIN R403

Labels and Location Aids Survey

TP6.1133.39

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

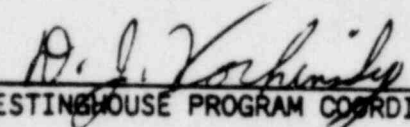
If lettering obscured by dirt, operation of incorrect
controls or delay in activation of correct
controls may result. Observation of incorrect
display or delay in observation may result.

k) REVIEW AND RECOMMENDATIONS:


- Signage should be changed to a night background with dark characters
- Recommend black lettering on white background.


ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

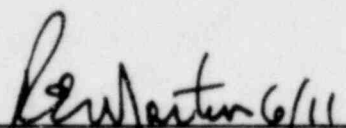

WESTINGHOUSE PROGRAM COORDINATOR

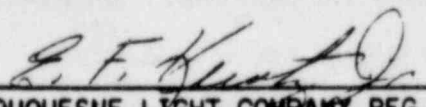
l) REVIEW AND DISPOSITION:

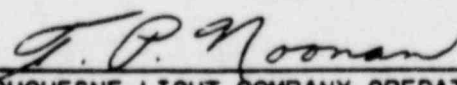
 Sufficient contrast exists based on BV-1 experience. As per normal housekeeping, board is routinely cleaned.

7/24/85 - RT recommends

black lettering on white background based on O700 guidelines. Note: RT understands that signs have not been ordered as of 7/24/85.


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BV PS/2
PLANT/UNIT

b) ORIGINATOR: J. Downing c) HED NO.: 2444-1110

d) REVIEWED BY: [Signature] e) DATE: 7/3/84
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: Large matrices not
subdivided by appropriate demarcation

g) ITEMS INVOLVED: see Attached Sheet

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

Large matrices of status lights are not
subdivided by appropriate demarcation.
6.8.3.2d (2)

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Labels and Location Aids

DLCIN R403

TP6.1B3.65


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Delay in observation of appropriate status
light or observation of incorrect status
light.

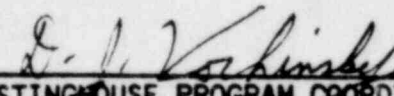
k) REVIEW AND RECOMMENDATIONS: Investigate the feasibility of using demarcation lines on status light panels.

Demarcation lines are not appropriate on status light panels.

NO ACTION


ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

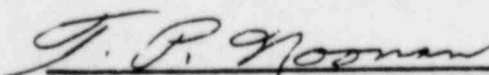

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Agree (No Action)


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 11-15-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER

 11-15-85
DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HED #

HEL#2***-1110

Status light panels:

11x8	man actuation sys. INOP TRAIN A	(1069)	PNL BA3
4x8	man actuation sys. INOP TRAIN B	(1070)	PNL BA3
4x8	main stm dnn isolation status	(1020)	PNL VC6
11x14	Extract stm wtr heater isolation valve status	(1019)	PNL VC5
4x8	stm bypass system status	(18)	PNL BC2
4x7	stm gen trip signal status	(19)	PNL BC2
11x12	stm gen trip signal status	(47)	PNL BC2
4x24	Primary Plant Parameters	(308)	PNL BB1
4x7	Reactor Coolant pump status	(465)	PNL BA4

1. The first experiment

2. The second experiment
3. The third experiment
4. The fourth experiment
5. The fifth experiment

6. The sixth experiment
7. The seventh experiment
8. The eighth experiment
9. The ninth experiment
10. The tenth experiment

11. The eleventh experiment
12. The twelfth experiment
13. The thirteenth experiment
14. The fourteenth experiment
15. The fifteenth experiment

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2***-1114

d) REVIEWED BY: A. J. Kochinsky e) DATE: 3/19/85
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: Abbreviations or Acronyms are not
consistent

g) ITEMS INVOLVED:

Unit 1

CCR

CCT

Unit 2

CCP

CCS

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.6.3.3 a.

Inconsistent use of Abbreviations and Acronyms between Unit 1 and Unit 2; Approved list not administratively controlled.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Validation of Control Room Functions (R406)


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

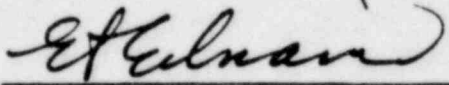
May cause delays and/or errors
in operators responses.


- K) REVIEW AND RECOMMENDATIONS: (1) Re-engineer consistent 'back' to conform to the approved list of terms (Acronyms)
(2) Ensure administrative control of the aforementioned system Acronyms.

suggest that - an approved list for Unit 1 and an approved list in Unit 2. Differences should be pointed out in training. Operators should be able to adapt up to specific problem cited. That is, i.e. P for Component Water Primary and CCS for Component Cooling Water Secondary vs Component Cooling Water Reactor and Component Cooling Water Turbine.

NO ACTION
a Unit 1 - Unit 2 team has been assembled to establish consistency. NO ACTION

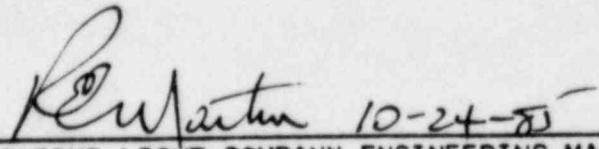

ESSEX HUMAN FACTORS PROJECT MANAGER

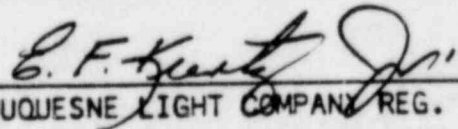

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

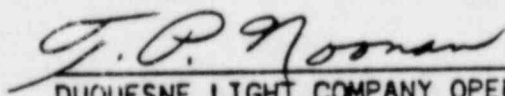

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:


No Action


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 7-15-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVSP/a
PLANT/UNIT

1407

b) ORIGINATOR: CE WILSON

c) HED NO.: 2V** - ~~2004~~

d) REVIEWED BY: D. J. Kochinsky
(Westinghouse)

e) DATE: 11-26-84

T
(Essex)

f) HED TITLE: DISPLAYS EXCEED MAXIMUM HEIGHT LIMITATIONS

g) ITEMS INVOLVED: SEE ATTACHED LIST

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.1.2.5 b.(1)

Numerous displays exceed the maximum
recommended height of 70".

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

Control Room Survey, T.P. 1.2 & 1.1.1.4
Anthropometrics

DLCIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Inability to accurately view & read displays in
appropriate and timely manner.

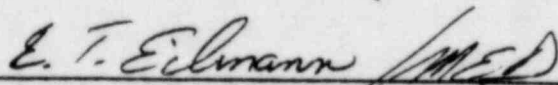
k) REVIEW AND RECOMMENDATIONS:

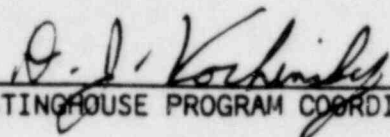
A study assessing the impact of the "too high" displays on operator performance is recommended. Any displays which require frequent or precise readings should be moved such that they are between 50 and 65 inches from the floor [6.1.2.5 b(2)].

These displays are readable from normal operating position. Also, there is no where to move them.

NO ACTION


ESSEX HUMAN FACTORS PROJECT MANAGER

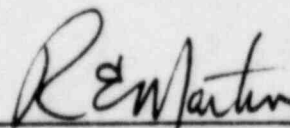

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

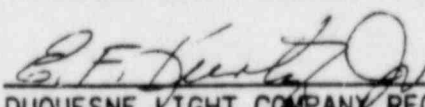

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Agree

No action

 11-15-85
DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 11-15-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER

 11-15-85
DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

2VXX-1407

DUGWESNE, BEAVER VALLEY - 2, TP-1.2, LIST 1.4, PART III (VERTICAL PANELS)

DISPLAYS EXCEEDING MAXIMUM
HEIGHT LIMITS

THESE DISPLAYS ARE
PLACED MORE THAN
70 INCHES ABOVE
THE FLOOR. THIS
LIST APPLIES TO
CRITERIA 6.1.2.5b.(1).

A-5

ENTIRE TOP ROW OF DISPLAYS

A-6

ENTIRE TOP ROW OF DISPLAYS

A-7

ENTIRE TOP ROW OF DISPLAYS

A-8

ENTIRE TOP ROW OF DISPLAYS

A-9

ENTIRE TOP ROW OF DISPLAYS

B-6

ENTIRE TOP ROW OF DISPLAYS

C-5

ENTIRE TOP ROW OF DISPLAYS
ENTIRE TOP ROW OF "EXTRACTION STM ISOLATION VVS &
FEEDWATER HTR ISOL VV STATUS" INDICATOR LIGHT PANEL
#1019

C-6

ENTIRE TOP ROW OF DISPLAYS
 ENTIRE TOP ROW OF "MAIN STEAM DRAIN ISOLATION
 VALVE STATUS" INDICATOR LIGHT PANEL
 #1020

C-7 & C-8ITEM NO.NAME PLATE

249

TURBINE SPEED VALVE & ROTOR POSITION RECORDER

558

TURBINE EH IND PANEL (UPPER 50%):

STATUS

LIMITS

MONITORS

} INDICATORS

THROTTLE VALVE POSITION

GOVERNOR VALVE POSITION

GOV CONTROL

VALVE POSITION LIMIT

} METERS

ENTIRE TOP ROW OF AMP & VOLT METERS

C-9

ENTIRE TOP ROW OF VOLT METERS

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) PS-101
BV SR-2
PLANT/UNIT

b) ORIGINATOR: T.J. Voss c) HED NO.: 2BXX-1401

d) REVIEWED BY: W. J. Catullo e) DATE: 6/26/54
(Westinghouse)

T. J. Voss
(Essex)

f) HED TITLE: Controls on Benchboards Outside the Reach Limits

g) ITEMS INVOLVED:
Controls in attached list.

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.1.2.2 d.(2) + 6.1.2.2c.
The listed controls are located outside the extended functional reach of the 5th percentile female. They are also outside the functional reach of the 95th percentile male (see attached benchboard profile diagram).

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Control Room Survey, Anthropometrics

TP 1.2BS.1.1

DLCIN 13403


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

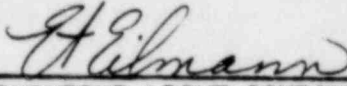
Inability to reach necessary controls without excessive effort.

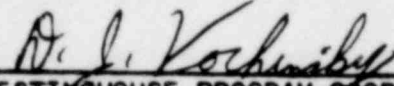
k) REVIEW AND RECOMMENDATIONS:

From attached list, determine which controls effect operation or plant safety to the extent that they should be located lower on the benchboard. Ensure such controls are located no more than 25 inches from the front edge of the console.

- TESTED WITH A 5TH PERCENTILE FEMALE OPERATOR (STEPHANIE LYONS, 5'-2"), SHE COULD REACH ALL CONTROLS WITHOUT TROUBLE.
- RECOMMEND NO ACTION.

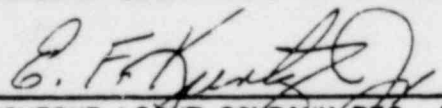

ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

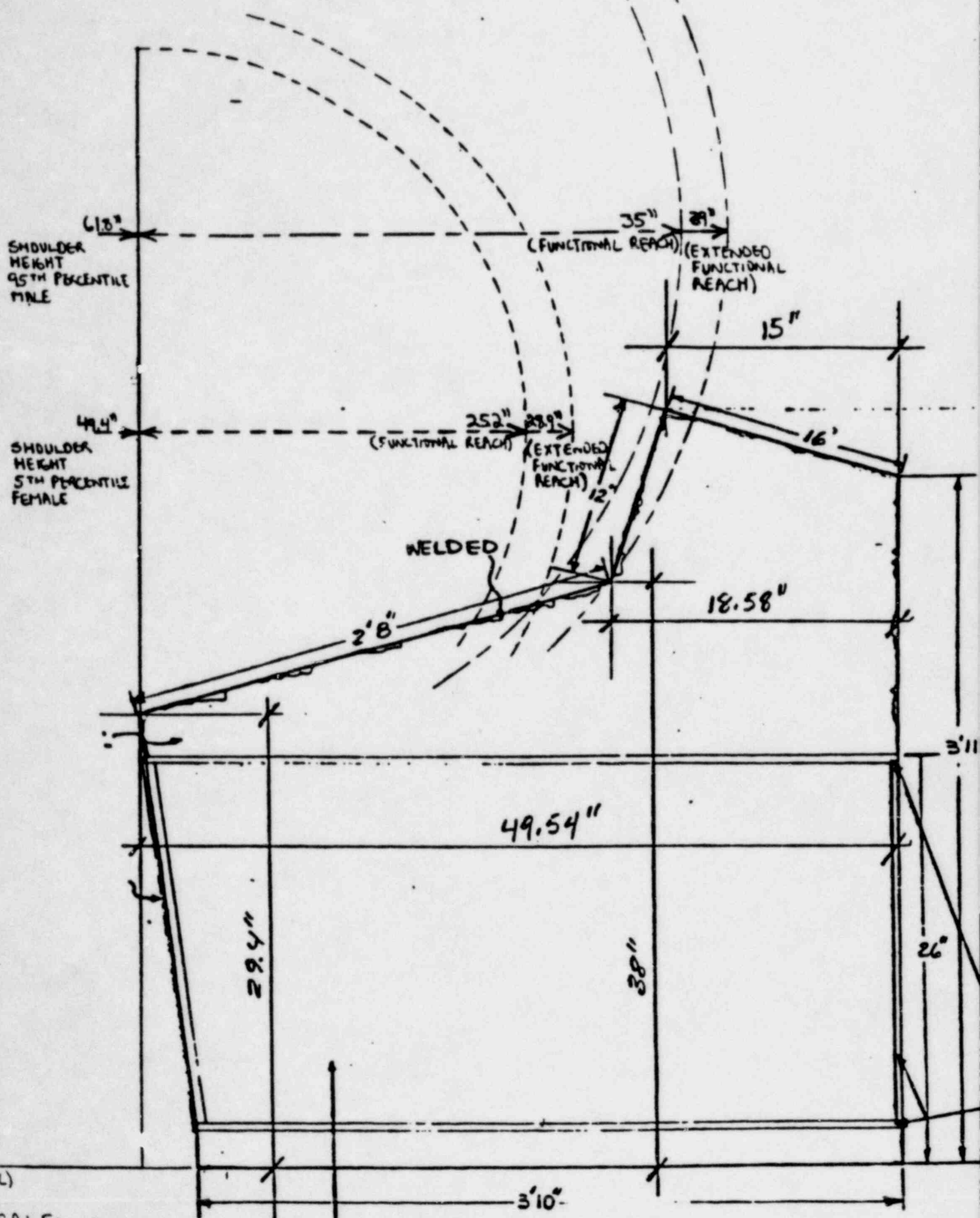

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER



SCALE:
1.375 in. = 1 ft.

APPENDIX B1.1
MEASUREMENTS DATA

HED#20XX-1401

DUQUESNE, BEAVER VALLEY-2, TP-1.2 LIST 1.1, PART I (BENCHBOARD)

CONTROLS OUTSIDE EXTENDED FUNCTIONAL REACH OF

5TH PERCENTILE FEMALE

(THESE CONTROLS ALSO OUTSIDE OF
FUNCTIONAL REACH OF 95TH PERCENTILE
MALE BUT WITHIN EXTENDED FUNCTIONAL REACH)

RE-25F

ITEM NO.

NAME PLATE

(CONTROLS ON
"VERTICAL"
SECTION OF
BENCHBOARD)

793
794
880
881
882
883
884
885

886
887
888
889

CONTAIN ISOL PH-A CONTAIN VENT ISOL
TRAIN-A-CONTAIN, PHA & VENT RESET
CONTAIN ISOL PH-B CONTAIN VENT ISOL
CONTAIN ISOL PH-B CONTAIN VENT ISOL
CONTAIN ISOL PH-B SPRAY RESET TR A
MAN RESET FOW ISOL TRAIN A
CONTAIN ISOL PHAC CONTAIN VENT ISOL
CONTAIN ISOL PHAC CONTAIN VENT ISOL
RESET-TR-B
CONTAIN ISOL PH-D CONTAIN VENT ISOL
CONTAIN ISOL PH-D CONTAIN VENT ISOL
CONTAIN ISOL PH-D SPRAY RESET TR B
MAN RESET FOW ISOL TRAIN B

(CONTROLS ON
"HORIZONTAL"
SECTION OF
BENCHBOARD)

470
514
479
486
493
500
508
548
590
520
525
531

2SSR* AOV105A1
2CVS* AOV151A
2CVS* AOV152A
2DAS* AOV100A
2CCP* MOV150-1
2CCP* MOV151-1
2SSR* AOV109A2
2CVS* AOV151B
2CVS* AOV152B
2DAS* AOV100B
2CCP* MOV150-2
2CCP* MOV151-2

~~(CONTROLS ON
"HORIZONTAL"
SECTION OF
BENCHBOARD
CLOSER THAN
3" FROM EDGE)~~

~~473
478
485
492
499
505
507
513
928
519~~

~~2SSR* AOV117A
2GNS* AOV101-1
2BDC* AOV100C1
2SDS* AOV111C1
2CHS* MOV308A
2CHS* MOV308B
2CHS* MOV308C
2QNS* AOV101-2
SPARE
2CHS* AOV204~~

RE-25G

ITEM NO.	NAMEPLATE
(CONTROLS ON - 654	RECIRC MODE SEL SW, TRAIN A
"VERTICAL" 1501	2QSS * P24A
SECTION OF 466	STEAM LINE ISOL RESET
BENCHBOARD) 1502	2QSS * SOV100A
1503	2QSS * SOV101A
1504	2QSS * SOV102B
890	MAN ACTUATION SAF INJ SIG
891	MAN RESET SAF INJ SIG TRAIN A
655	RECIRC MODE SQ SW TRAIN B
464	SAFEGUARD SYS STAT
(CONTROLS ON 897	2SWE - P21A
"HORIZONTAL" 536	2SWS - P21A
SECTION OF 542	2SWS * P21C
BENCHBOARD) 550	2SIS * P23A
553	2RSS * P21A
557	2RSS * P21C
561	2QSS * P21A
565	2SIS * P21A
572	2SIS * AOV889
898	2SWE - P21B
578	2SWS * P21B
584	2SWS * P21C
592	2SWS * P23B

(CONTROLS ON 547	2SWS * MOV105C
"HORIZONTAL" 497	2SWS * MOV113A
SECTION OF 699	2SWS * MOV113C
BENCHBOARD 556	2ASS * MOV101
CLOSER THAN 571	2SIS * MOV852A
3" FROM EDGE) 573	2SIS * MOV851A
1557	2SIS * AOV850A
1558	2SIS * AOV850B
1559	2SIS * AOV850C
589	2SWS * MOV105D
529	2SWS * MOV113B
787	2SWS * MOV113C
595	2SIS * MC 947

RE-25H

	<u>ITEM NO.</u>	<u>NAMEPLATE</u>
(CONTROLS ON "VERTICAL" SECTION OF BENCHBOARD)	-1505	2QSS * P24B
	467	STEAM LINE ISOL RESET
	1506	2QSS * SOV 100 B
	1507	2QSS * SOV 101 B
	1508	2QSS * SOV 102 B
	892	MAN ACTUATION SAF INJ SIG
	893	MAN RESET SAF INJ SIG TRAIN B
	1150B	2RHS * MOV 750 B
	1150A	2RHS * MOV 750 A
	1149	2RHS * MOV 701 B
	1151	2RHS * MOV 702 A
	1106A	SPARE
	1108	2GWS * MOV 10 B
	1146	2RHS * P21A TEST
	1147	2RHS * P21B TEST
	1104	2GWS * AOV 104
	1105	2GWS * AOV 105
1069	MAN ACTUATION SYS INOP TRAIN A	
1070	MAN ACTUATION SYS INOP TRAIN B	
(CONTROLS ON "HORIZONTAL" SECTION OF BENCHBOARD)	596	2RSS * P21B
	601	2RSS * P21D
	605	2QSS * P21D
	610	2SIS * P21D
	617	2SIS * MOV 842
	1509	2SIS * MOV 841
	623	2DAS * P204A
	1106B	SPARE
	636	2RHS * P21A
	641	2RHS * P21B
	1107	SPARE
	645	REACTOR TRIP SWITCH
	649	2GWS * C21A
	653	2GWS * C21B
	658	2DGS * P21A

(CONTROLS ON "HORIZONTAL" SECTION OF BENCHBOARD CLOSER THAN 3" FROM EDGE)	627	2SIS * MOV 852C
	620	2SIS * MOV 865 B
	629	2GNS * MOV 853C
	622	2SIS * MOV 850C
	632	2SIS * MOV 850F
	626	2GNS * HCV 936
	635	2SVS * PCV 101A
	644	2SVS * PCV 101C
640	2SVS * PCV 101B	

RE-25J

HED#2E** -1401

ITEM NO.	NAME PLATE
(CONTROLS ON -1003	2SGC - SOV104A
"VERTICAL" 1004	2SGC - SOV104B
SECTION OF 975	2CHS - PCV116A
BENCHBOARD) 976	2CHS - PCV116B
977	2CHS - LCV115A
978	2CHS - LCV115A
719	2CHS - FCV113A
(CONTROLS ON 668	2OGS - P22A
"HORIZONTAL" 675	2BRS - P22A
SECTION OF 679	2BRS - P22A
BENCHBOARD) 684	2SGC - P22A
688	2SGC - P22B
698	2SGC - P23A
702	2SGC - P23B
691	EVAP 21A TO 21B ISOLATION VV'S
694	2SGC - P25B
701	2SGC - P27 / 2SGC-SH21 -
712	2CHS * P22A
708	2CHS * P22B
722	2CHS - MOV 311
720	BORIC ACID FLOW TO BLENDER TOTALIZER
(CONTROLS ON 678	2BRS - AOV100A
"HORIZONTAL" 682	2BRS - AOV100B
SECTION OF 725	2SGC - AOV122A
BENCHBOARD 726	2SGC - AOV122B
CLOSER THAN 945	2SGC - AOV123
3" FROM EDGE) 1519	2SGC - MCV100
704	2SGC - AOV125A
706	2SGC - AOV125B
979	2CHS - MOV111
718	2CHS - LCV115E
724	VOL CONT TK LVL CONTROL
721	2CHS - LCV115A / 2CHS - LCV112

RE-25KITEM NONAME PLATE

(CONTROLS ON- 732
 "VERTICAL" 909
 SECTION OF 739
 BENCHBOARD) 746
 1122A
 1122B
 761

2CHS-FCV168
 2CHS-HCV168
 2CHS-HCV137
 2CHS-HCV186
 2GNS-PCV101A
 2GNS-PCV101B
 2CHS-HCV142

(CONTROLS ON 740
 "HORIZONTAL" 747
 SECTION OF 753
 BENCHBOARD) 757
 762
 766
 772
 777
 782
 769

2CHS*P21A
 2CHS*P21C
 2CHS*MOV8130A
 2CHS*MOV8130B
 2CHS*P21B
 2CHS*P21C
 2RCS-P21A
 2RCS-P21B
 2RCS-P21C
 2RCS-MOV516

~~(CONTROLS ON 1512
 "HORIZONTAL" 745
 SECTION OF 752
 BENCHBOARD 756
 CLOSER THAN 768
 3" FROM EDGE) 765
 770
 776
 781~~

~~2SIS*MOV840
 2CHS*LCV115B
 2CHS*LCV115C
 2CHS*MOV87B
 2CHS*MOV881
 2CCP-TCV144
 2CHS-PCV145
 2CHS-FCV122
 2CHS-FCV160~~

RE-25NITEM NO.NAMEPLATE

(CONTROLS ON
"VERTICAL"
SECTION OF
BENCHBOARD)

- 318 A
318 B

RODS OUT
RODS IN

(CONTROLS ON
"HORIZONTAL"
SECTION OF
BENCHBOARD)

357
358
359
355
356
341
345
344

2RCP-H2C
2RCP#H2A
2RCP#H2D
2RCP#H2B
2RCP#H2E
REFLECTOR TRIP
1-N 38 A } (INSTRUMENT NOS.)
1-N 38 B }

(CONTROLS ON
"HORIZONTAL"
SECTION OF
BENCHBOARD
CLOSER THAN
3" FROM EDGE)

324
374
375
376
377
323
354
352
1096B

LS/459Y (INST. NO)
PRESSURIZER LEVEL CONTROL
2RCS#PCV455A
2RCS#PCV455B
PRESSURIZER PRESS CONTROL
2CHS#LCV460B
2RCS#PCV456
2RCS#PCV455C
ANN/CRT CONTROL PANEL

RE-25P

	<u>ITEM NO.</u>	<u>NAME PLATE</u>
(CONTROLS ON "VERTICAL" SECTION OF BENCH BOARD)	386	2CCP*MOV103A
	- 387	2CCP*MOV107A
	388	2CCP*MOV103B
	389	2CCP*MOV107B
	384	2CCP-MOV126
	431	2CCP*ADV170
	379	2CCP*MOV103C
	390	2CCP*ADV107B
	395	2CCP*MOV173
	385	2CCP-MOV127
(CONTROLS ON "HORIZONTAL" SECTION OF BENCHBOARD)	397	2FNC-P24A
	398	2QSS-P22A
	399	2QSS-P22B
	400	2FNC*P21A
	401	2CCP*P21A
	402	2CCP*P21C (1A-CCPCB, INSTR NO.)
	403	2CCP*P21B
	404	2CCP*P21C (1A-CCPCA, INSTR NO.)
	405	2FNC*P21B
406	2QSS-P23	

(CONTROLS ON "HORIZONTAL" SECTION OF BENCH BOARD CLOSER THAN 8" FROM EDGE)	990	2CCP*ADV105
	433	2CCP*ADV111C

RE-25U

<u>ITEM NO.</u>	<u>NAMEPLATE</u>
(CONTROLS ON - 33	2CWS-P21A
"HORIZONTAL" 34	2CWS-P21B
SECTION OF 35	2CWS-P21C
BENCHBOARD) 36	2CWS-P21D
52	2H0H-P22A
49	2CNM-P21A
50	2CNM-P21B
51	2CNM-P21C
68	2FWS-MOV150A
69	2FWS-MOV150B

(CONTROLS ON 1124	2BDG-ADV 440	
"HORIZONTAL" 102	FW FLOW SELECT	(FS/478Y, INSTR. NO.)
SECTION OF 103	STM FLOW SELECT	(FS/478Z, INSTR. NO.)
BENCHBOARD 107	STM-FLOW SELECT	(FS/478Z, INSTR. NO.)
CLOSER THAN		
3" FROM EDGE)		

RE-25V

<u>ITEM NO.</u>	<u>NAMEPLATE</u>
(CONTROLS ON 789	MN STM LINE SYS LVL ACTUATION TR A
"VERTICAL" 790	MN STM LINE SYS LVL ACTUATION TR A
SECTION OF 791	MN STM LINE SYS LVL ACTUATION TR B
BENCHBOARD) 792	MN STM LINE SYS LVL ACTUATION TR B
1126A	2FWE * SOV100A
1126B	2FWE * SOV100B
127	TURB FIRST STAGE PRESS RECORDER
(CONTROLS ON 91	2MSS * HYV101A
"HORIZONTAL" 1148A	2MSS * SOV105A
SECTION OF 1148D	2MSS * SOV105D
BENCHBOARD) 112	SPARE
138	2GMO-P201
118	2GSS-FN21A
124	2TMG-M205
125	2TML-P207
133	2TML-P215
134	2TMB-P209A
135	2TMB-P209B
137	2TML-P202
147	2TML-P210
145	2GMO-P211

RE-25V (CONT)

<u>ITEM NO.</u>	<u>NAMEPLATE</u>
(CONTROLS ON- "HORIZONTAL" SECTION OF BENCH BOARD CLOSER THAN 3" FROM EDGE)	2FWE*HCV100C
98	2FWE*HCV100G
99	2FWE*HCV100F
96	2FWE*HCV100D
95	2MSS-MOV100A
110	2MSS-MOV100B
111	2GSS-MOV202
122	STM DUMP INTLK BYPASS SELECTOR (1-MSS)
130	STM DUMP INTLK BYPASS SELECTOR (1-MSS)
129	EHC CONTROL PANEL
144	2IAC-C21A
151	

RE-25W

<u>ITEM NO.</u>	<u>NAMEPLATE</u>
(CONTROLS ON "HORIZONTAL" SECTION OF BENCH BOARD)	2GMD-P206
146	NORMAL SYNC BKR 352
153	EMER SYNC BKR 352
154	NORMAL SYNC BKR 362
155	EMER SYNC BKR 362
156	4160 V TRANS 2A VOLTS
188A	4160 V TRANS 2B VOLTS
189A	LIVE BUS TRANS CW
197	
(CONTROLS ON "HORIZONTAL" SECTION OF BENCH BOARD CLOSER THAN 3" FROM EDGE)	2IAC-C216
152	EXCITER ACB
165	SPARE
166	SPARE
167	SPARE
168	SPARE
169	SPARE
185	EMER GEN 2-1 VOLT ADJUST
1064A	DSL GEN 2-1 MAN FLD FLASH
1061A	DSL GEN 2-1 VOLT REG CONT
220	EMER GEN 2-2 VOLTS ADJUST
1064B	DSL GEN 2-2 MAN FLD FLASH
1061B	DSL GEN 2-2 VOLT REG CONTROL

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) ^{ASTY}
BVSR-2
PLANT/UNIT

b) ORIGINATOR: CHARMAINE WILSON c) HED NO.: 2BXX-1402

d) REVIEWED BY: W. J. Catullo Jr e) DATE: 7/3/84
(Westinghouse)

T
(Essex)

f) HED TITLE: CONTROLS WITHIN 3 INCHES OF FRONT EDGE
OF CONSOLE

g) ITEMS INVOLVED:

CONTROLS IN ATTACHED LIST

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.1.2.2 d (1)

The listed controls are within 3 inches of the front end of the console & violate a recommended distance of 3 inches between console edge & controls.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

TP 1.2 BS.1.1

DLCIN R403

Control Room Survey, Anthropometrics

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:


Accidental Activation of controls.

k) REVIEW AND RECOMMENDATIONS:

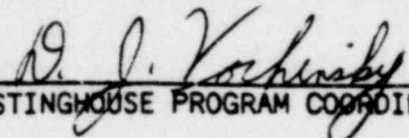
① Attach a guardrail around the benchboard.

② Investigate the nature/use of each of the controls listed. For those controls which are safety related or critical to plant operation, the installation of plastic protective covers or raised barriers is recommended. Interlocks may also provide a useful guard against accidental activation.

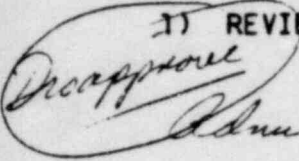
- CORE TEAM RECOMMENDS OPTION ①, ATTACH GUARDRAIL AROUND FRONT EDGE OF BENCHBOARD.

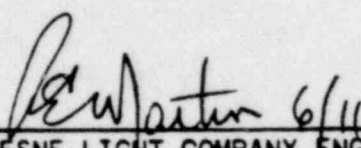

ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

2) REVIEW AND DISPOSITION:

 Administrative controls preclude inadvertent operation by unauthorized personnel. Cognizant operator is responsible for all manipulations.


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

ANTHROPOMETRICS
APPENDIX B1.1
MEASUREMENTS DATA

TP-1.2

HEID#26XX-1402

DUQUESNE, BEAVER VALLEY-2, TP-1.2, LIST 1.1, PART I (BENCHBOARD)

CONTROLS ON "HORIZONTAL" SECTION OF BENCHBOARD CLOSER THAN 3" FROM EDGE.

	<u>ITEM NUMBER</u>	<u>NAME PLATE</u>	
<u>RE-25F:</u>	(CONTROLS ON	473	2SSR* AOV117A
	"HORIZONTAL"	478	2GNS* AOV101-1
	SECTION OF	485	2B06* AOV100C1
	BENCHBOARD	492	2SDS* AOV111C1
	CLOSER THAN	499	2CHS* MOV308A
	3" FROM EDGE)	505	2CHS* MOV308B
		507	2CHS* MOV308C
		513	2QNS* AOV101-2
		928	SPARE
		519	2CHS* AOV204
<u>RE-25G:</u>	(CONTROLS ON	547	2SWS* MOV105C
	"HORIZONTAL"	497	2SWS* MOV113A
	SECTION OF	699	2SWS* MOV113C
	BENCHBOARD	556	2ASS - MOV101
	CLOSER THAN	571	2SIS* MOV852A
	3" FROM EDGE)	573	2SIS* MOV851A
		1557	2SIS* AOV850A
		1558	2SIS* AOV850B
		1559	2SIS* AOV850C
		589	2SWS* MOV105D
		529	2SWS* MOV113B
		787	2SWS* MOV113C
		595	2SIS* MC 947
	<u>RE-25H:</u>	(CONTROLS ON	627
"HORIZONTAL"		620	2SIS* MOV865B
SECTION OF		629	2GNS* MOV853C
BENCHBOARD		622	2SIS* MOV850C
CLOSER THAN		632	2SIS* MOV850F
3" FROM EDGE)		626	2GNS* HCV 936
		635	2SVS* PCV101A
		644	2SVS* PCV101C
		640	2SVS* PCV101B
		650	2SVS* PCV104
		1096A	ANN/CRT CONTROL PANEL

ITEM NO.
NAME PLATE
RE-25J:

(CONTROLS ON 678
"HORIZONTAL" 682
SECTION OF 725
BENCHBOARD 726
CLOSER THAN 945
3" FROM EDGE) 1519
704
706
979
718
724
721

2BRS-AOV100A
2BRS-AOV100B
2SGC-AOV122A
2SGC-AOV122B
2SGC-AOV123
2SGC-MCV100
2SGC-AOV125A
2SGC-AOV125B
2CHS-MOV111
2CHS-LCV115E
VOL CONT TK LVL CONTROL
2CHS-LCV115A / 2CHS-LCV112

RE-25K:

(CONTROLS ON 1512
"HORIZONTAL" 745
SECTION OF 752
BENCHBOARD 736
CLOSER THAN 768
3" FROM EDGE) 765
770
776
781

2SIS*MOV840
2CHS*LCV115B
2CHS*LCV115C
2CHS*MOV87B
2CHS*MOV381
2CCP-TCV144
2CHS-PCV145
2CHS-FCV122
2CHS-FCV160

RE-25N:

(CONTROLS ON 324
"HORIZONTAL" 374
SECTION OF 375
BENCHBOARD 376
CLOSER THAN 377
3" FROM EDGE) 323
354
352
1096B

LS/459Y (INSTR. NO)
PRESSURIZER LEVEL CONTROL
2RCS*PCV455A
2RCS*PCV455B
PRESSURIZER PRESS CONTROL
2CHS*LCV460B
2RCS*PCV456
2RCS*PCV455C
ANN/CRT CONTROL PANEL

RE-25P:

(CONTROLS ON 990
"HORIZONTAL" 433
SECTION OF
BENCHBOARD
CLOSER THAN
3" FROM EDGE)

2CCP*AOV105
2CCP*AOV111C

ITEM NO:NAME PLATE

25U:

(CONTROLS ON 1124
 "HORIZONTAL" - 102
 SECTION OF 103
 BENCHBOARD 107
 CLOSER THAN
 3" FROM EDGE)

2BDG-ADN 110
 FW-FLOW SELECT (FS/478Y, INSTR NO.)
 STM-FLOW SELECT (FS/478Z, INSTR NO.)
 STM-FLOW SELECT (FS/478Z, INSTR NO.)

RE-25V (CONT)ITEM NO.NAMEPLATE

25V:

(CONTROLS ON 98
 "HORIZONTAL" 99
 SECTION OF 96
 BENCHBOARD 95
 CLOSER THAN 110
 3" FROM EDGE) 111
 122
 130
 129
 144
 151

2FWE*HCV100C
 2FWE*HCV100G
 2FWE*HCV100F
 2FWE*HCV100D
 2MSS-MOV100A
 2MSS-MOV100B
 2GSS-MOV202
 STM DUMP INTLK BYPASS SELECTOR (1-MSS N
 STM DUMP INTLK BYPASS SELECTOR (1-MSS N
 EHC CONTROL PANEL
 2IAC-C21A

-26W:

(CONTROLS ON 152
 "HORIZONTAL" 165
 SECTION OF 166
 BENCHBOARD 167
 CLOSER THAN 168
 3" FROM EDGE) 169
 185
 1064A
 1061A
 220
 1064B
 1061B

2IAC-C216
 EXCITER ACB
 SPARE
 SPARE
 SPARE
 SPARE
 EMER GEN 2-1 VOLT ADJUST
 DSL GEN 2-1 MAN FLD FLASH
 DSL GEN 2-1 VOLT REG CONT
 EMER GEN 2-2 VOLTS ADJUST
 DSL GEN 2-2 MAN FLD FLASH
 DSL GEN 2-2 VOLT REG CONTROL

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) ^{TJ}
^{PS}
BVSR/2
PLANT/UNIT

b) ORIGINATOR: CE WILSON c) HED NO.: 2BXX-1403

d) REVIEWED BY: *N. J. Catullo* e) DATE: 7/3/84
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: INADEQUATE FOOT ROOM UNDER BENCH BOARDS

g) ITEMS INVOLVED: All Benchboard consoles in Control Room

h) PROBLEM DESCRIPTION AND 07 PARAGRAPH NUMBER: 6.1.2.2.g

A 4 inch clearance both horizontally & vertically
is recommended for foot clearance at benchboards.
Actual clearance is 3.54.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER: Control Room Survey, Anthropometrics
TP 1.2 B 5.1.1

DLCIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:


Delay or error in control activation.

k) REVIEW AND RECOMMENDATIONS:

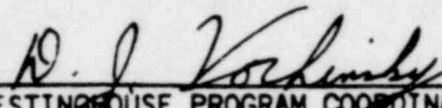
Installation of a hand rail around the front of the benchboard would provide a 4" clearance for feet, and help overcome problems with displays and controls too close to the edge of the board. (see HED No. ZB*4 - 1402)

2/11/85 Discrepancy involves less than $\frac{1}{2}$ " of foot room. Guard rail may help somewhat, however, this is not a serious problem. Action is not essential.

3/15/85 Handrail option identified in (HED 1402).

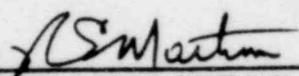

ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

HED - 1402 was dispositioned "NO ACTION".
Agree as stated above this is not a serious problem and also no foot controls exist, also thus "NO ACTION" is required.


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 6-14-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) ^{PS} BVSP-2
PLANT/UNIT

b) ORIGINATOR: T.J. Voss c) HED NO.: 2VC6-1404

d) REVIEWED BY: A. J. Vochinsky e) DATE: 6/26/84
(Westinghouse)

T. J. Voss
(Essex)

f) HED TITLE: Controls on Vertical Panels Lower Than Minimum Height.

g) ITEMS INVOLVED:

Controls listed below and those on the attached page.

RE-25R (C-6)	Item No	Nameplate	Height
	11300	(ICWSNG, INSTR NO.)	24"
	993	2CWS-MOV202 A,B,C,D,E,F,G,H,I,K	"
	994	LOCAL/REMOTE SELECTOR	"

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.1.2.5a.

Controls are lower than the minimum recommended height of 34".

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Control Room Survey, Anthropometrics
TP 1.285.1.1
DLCIN R403


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

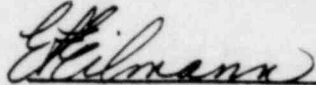
Inability to operate controls in an appropriate and timely manner.

k) REVIEW AND RECOMMENDATIONS:

Relocate controls higher on panel (ie. above 34").

- ANNUNCIATOR SILENCE CONTROLS (ON VERT. PANEL) ARE NOT CRITICAL, MAIN CONTROLS ARE ON BENCHBOARD, AND ARE THE ONLY PUSHBUTTONS ON THE VERT. BOARD (NO CONFUSION)
- ITEMS 1130-A, C, & E ARE IN GOOD LOCATION (EXCEPT FOR HEIGHT) RELATIVE TO THEIR FUNCTION. NOT CRITICAL CONTROLS. NO ROOM TO MOVE.
- THE TURBINE EXHAUST HOOD SPRAY CONTROL IS NOT CRITICAL, NO NEED TO MOVE IT
- RECOMMEND NO ACTION.

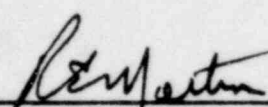

ESSEX HUMAN FACTORS PROJECT MANAGER

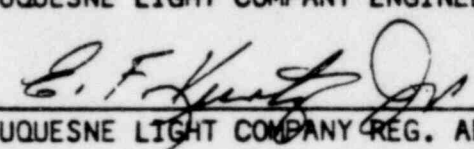

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

l) REVIEW AND DISPOSITION:

Agree - NO ACTION


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HED# 2YC6-1404

Controls on Vertical Panels Lower Than Minimum Height (34")

<u>Sect #</u>	<u>Item No</u>	<u>Nameplate</u>	<u>Height</u>
RE-25B (A-6)	662	Annunciator Silence	30"
RE-25L (B-5)	338	Annunciator Silence	31"
RE-25Q (C-5)	1130E	2CWS-MOY203E	24"
"	1030A	2CWS-MOY203A	29"
RE-25R (C-6)	1130C	1CWSNG	29"
RE-25S (G7)	906	Turb. Exh Hood Spray Ctrl.	26"
"	61	Annunciator Silence	28"

a) ^{PSTM}
BV SP-2
 PLANT/UNIT

b) ORIGINATOR: T J Voss c) HED NO.: 2VXX-1405

d) REVIEWED BY: *[Signature]* e) DATE: 6/27/84
 (Westinghouse)

[Signature]
 (Essex)

f) HED TITLE: Displays on Vertical Panels are Too Low to be Viewed from Normal Viewing Area.

g) ITEMS INVOLVED:
Displays in attached list.

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.1.2.2 + 6.1.2.5b.

Displays lower than 40" on the vertical panel cannot be viewed by 5th percentile female from normal viewing area (in front of benchboards) See attached diagram. Minimum height for all displays is 41". Frequently read displays should be above 50".

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Control Room Survey, Anthropometrics
TP 1.235.1.1

DLCIN R403


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Inability to read displays.

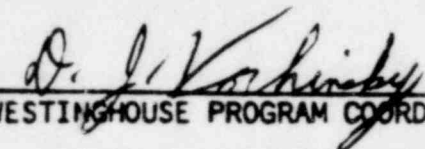
k) REVIEW AND RECOMMENDATIONS:

Determine which displays on the attached list affect plant operations/safety to the extent that they should be located higher on the vertical panels. Ensure such displays are located above 41" from the floor.

- 5TH PERCENTILE FEMALE COULD SEE ALL DISPLAYS ABOVE 25" FROM RAISED FLOOR.
- ITEMS 860 and 105 B (SG Press. Rec'n and RCS Wide Range Press. Rec.) ARE CRITICAL DISPLAYS NOT READABLE FROM FRONT OF BENCHBOARD
- RELOCATE 105 B AND 860 TO A MORE READABLE LOCATION, I.E. HIGHER UP ON ~~RECOMMENDED~~ VERTICAL PANEL.


ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

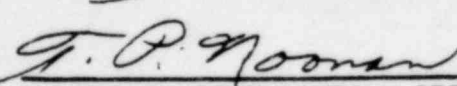

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

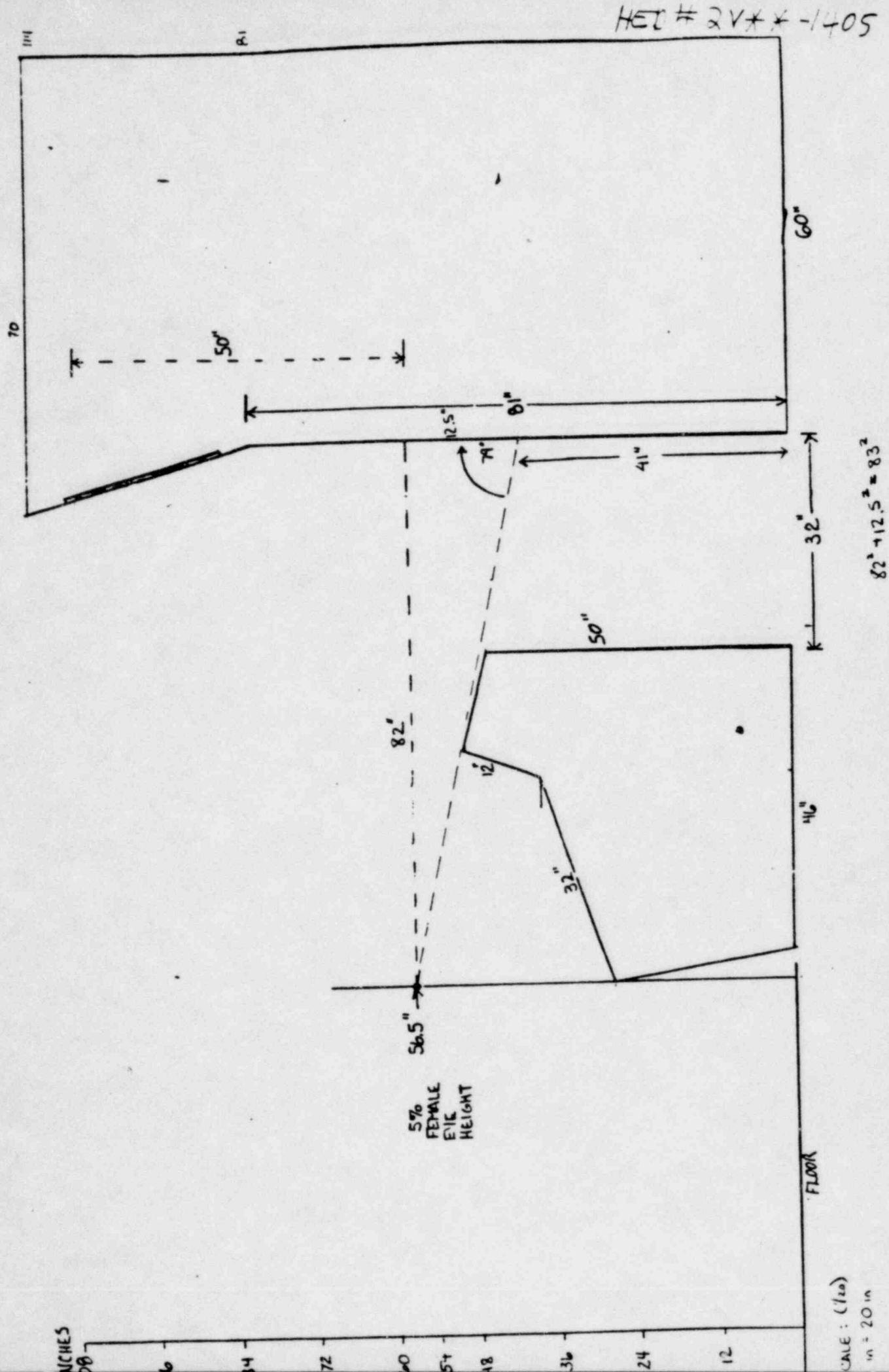
No action; Recorders are used for trending indication is readily available for operators


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

VISUAL BOUNDARIES - VERTICAL PANELS



SCALE: (1/20)
1" = 20' 11"

ANTHROPOMETRICS
APPENDIX B1.4
MEASUREMENTS DATA

TP-1.2
HED#2VXX-1-05
ATTACHMENT 1

DUQUESNE, BEAVER VALLEY-2, TP-1.2 LIST 1.4, PART II (VERTICAL PANELS)

OUT-OF-VIEW DISPLAYS

These displays cannot be viewed by the 5th percentile female standing in front of the normal viewing area for displays on vertical panels (ie. from in front of benchboards). This list applies to Criteria 6.1.2.2 + 6.1.2.5b.

(below 41")

A-7

ITEM NO.

DESCRIPTION

828

BORON RECOVERY DEGASIFIER 21A+21B
TEMPERATURE RECORDER

A-8

1016

BORIC ACID TANK LEVEL RECORDER

860

REACTOR COOLANT SYS WIDE RANGE
PRESSURE RECORDER

move

SEE ATTACHMENT 2

A-9

1097

PRI DRN XFR TK 21 INDICATOR

1098

PRI DRN XFR TK 22 INDICATOR

1067

REACTOR CONT SUMP LEVEL
RECORDER

48

LOOP 21, 22, 23 COLD LEG
TEMPERATURE RECORDER

G R INDICATOR LIGHTS,
(BELOW RCP TEMP RECORDER)

HED#2V** -1+05

ATTACHMENT 1

C-5

ITEM NO.

DESCRIPTION

1018A

STEAM DRAINS TEMP
RECORDER

1018B

EXTRACTION STEAM DRAINS
TEMP RECORDER

C-6

105B

STM GEN 21A,B,C PRESS
RECORDER

move

SEE ATTACHMENT 2 202E,F,
G,H,J,
K

CWS - MOV INDICATOR LIGHTS

1130C, D

GAR INDICATOR LIGHTS

C7 + C8

—

G R INDICATOR LIGHTS, LOWER ROW

255

VIBRATION POWER, POWER UNIT

256

ECCENTRICITY POWER, " "

257

DIFF EXP POWER, " "

463

ROTOR POSITION, " "

251

SPEED + VALVE POWER, " "

254

CASING EXPANSION
ROTOR POSITION POWER, " "

264B

TURBINE 1ST STAGE PRESS
RECORDER

264A

TURBINE 1ST STAGE PRESS
RECORDER

C79 C8 (continued)

HED#2VXX-1405

ATTACHMENT 1.

ITEM NO.

DESCRIPTION

1109 A,B,C,
DE,F,G,H

SYNCHRO INDICATING LIGHTS

C-9

229F

BATT 2-6 VOLTS
INDICATOR

230F

BATT 2-6 GROUND VOLTS
INDICATOR

HED No. ZV** - 1405

ATTACHMENT 2

a. SWITCH Item 860 - Reactor Coolant System Wide Range Pressure
[2RCS - PR 402]

WITH,

EITHER, Item 844 - Str. Gen. Cleanup Evap. 21A, 21B Feed Flow Recorder
[2SGC - PR 109]

OR, Item 845 - Aux. Str. to Evap. Reboiler 21A & 21B Press. Recorder
[2ASS - PR 118]

b. SWITCH Item 105B - Str. Gen 21A, B, C Press. Recorder
[2MSS - PR 475]

WITH Item 276 - Condenser Vacuum Side A, Side B Press. Recorder
[2CNM - PR 103]

a.



FRONT VIEW
VERTICAL BOARD SECTION A8, SH4
BEAVER VALLEY POWER STATION-UNIT NO.2
O.F.E. NO. 10030
C.C. NO. 25D
AA No. 10030-RE-25D

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS/2
PLANT/UNIT

b) ORIGINATOR: CE WILSON c) HED NO.: 2VXX-1406

d) REVIEWED BY: N. J. Catullo
(Westinghouse) e) DATE: 7-31-84

[Signature]
(Essex)

f) HED TITLE: CRT VIEWING ANGLE TOO SMALL

g) ITEMS INVOLVED:

STATUS CRT #5, SECTION C OF VERTICAL BOARD
UTILITY CRT #6, SECTION A OF VERTICAL BOARD

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.7.2.3b

Guidelines recommend that the minimum angle between the operator's LOS from the normal work station to the display screen should be 45°. When the operator stands at the dedicated response station, the viewing angle is less than 45°.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Control Room Survey, anthropometrics

TP 1.2 BS.1.1

DLCIN R403


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Inability to quickly and accurately view CRT display.

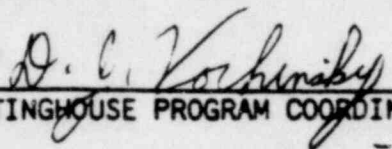
K) REVIEW AND RECOMMENDATIONS:

Operators will probably have to move to a position directly in front of CRTs to read the display. As such, a small viewing angle is not considered a major problem. No modification recommended.

• Recommend No Action.

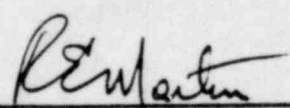

ESSEX HUMAN FACTORS PROJECT MANAGER

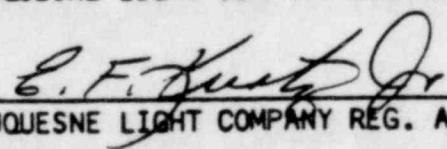

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

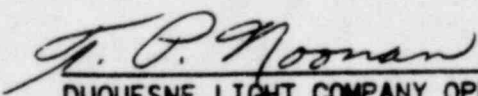

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

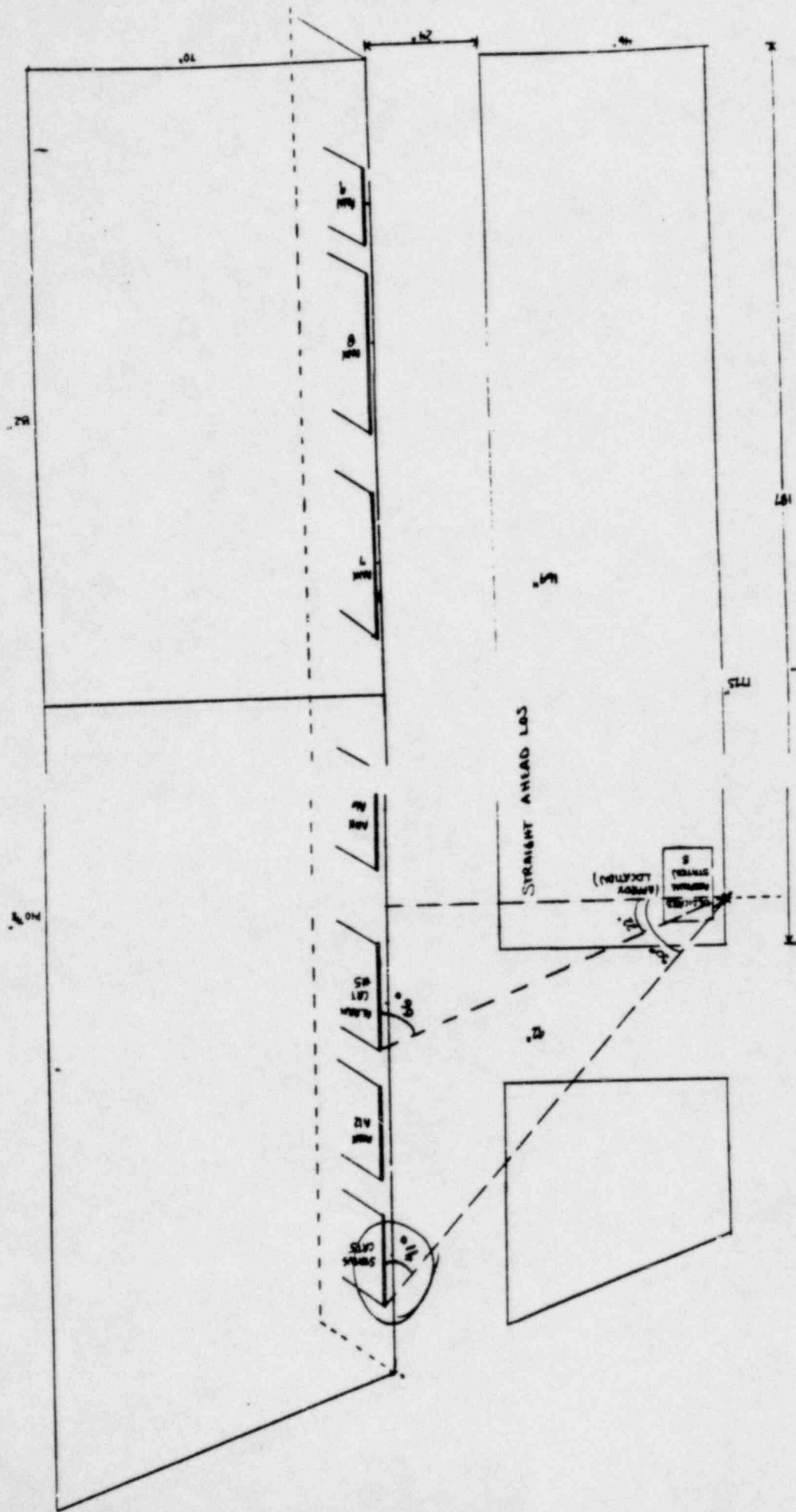
Agree - NO ACTION


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

OVERHEAD VIEW
SECTION C

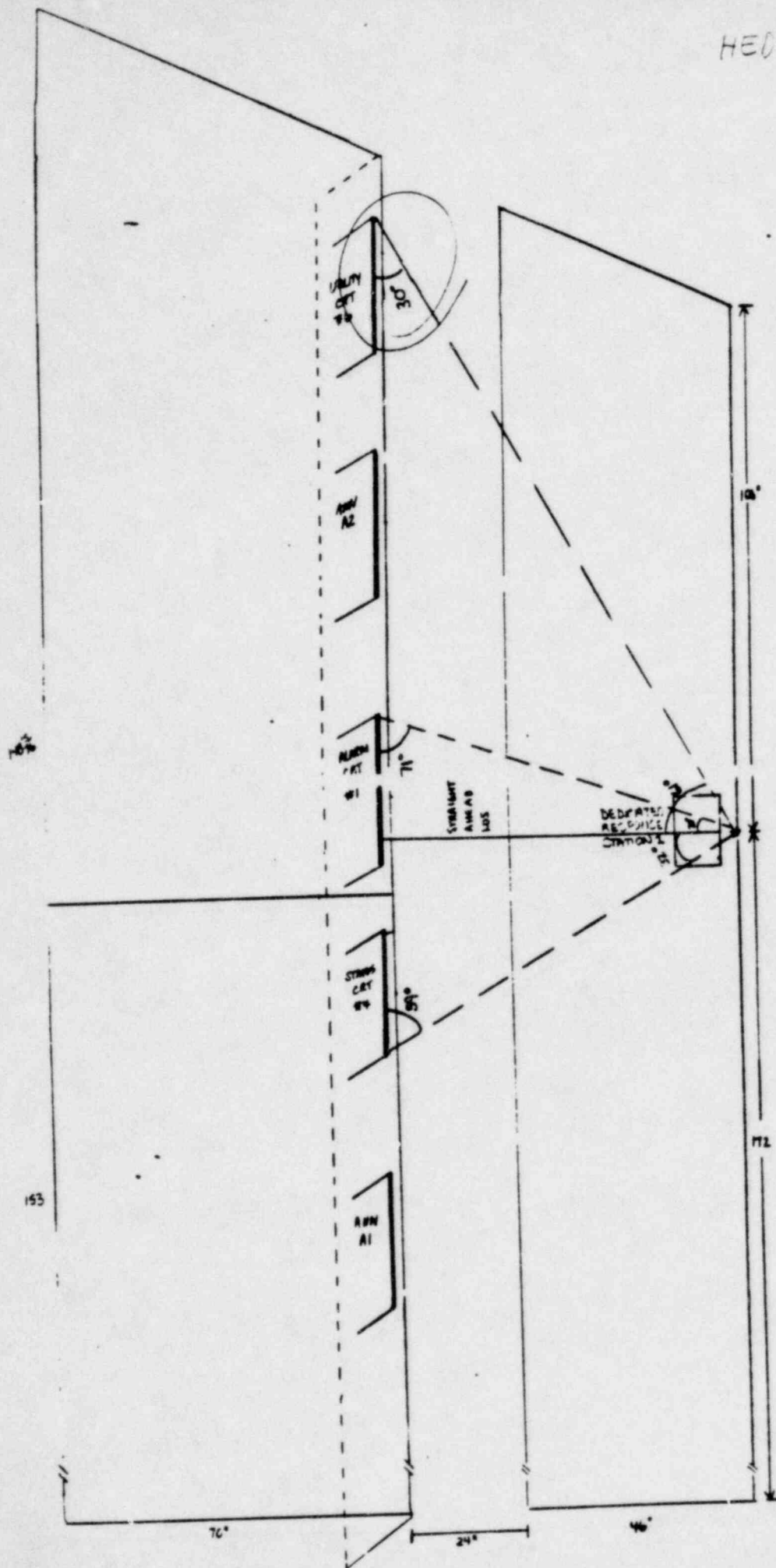


SCALE APPROXIMATE

HEC # 21XX-1406

CIT DISPLAYS, HORIZONTAL LIMITS

OVERHEAD VIEW
SECTION A



HEO # 2 V X X - 1406

SCALE APPROXIMATE

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: M Francher c) HED NO.: 2ESX-1408

d) REVIEWED BY: A. J. Korchinsky e) DATE: 5/14/85
(Westinghouse)

I. Vora
(Essex)

f) HED TITLE: Controls are beyond forward functional reach of the 5th percentile female adult.

g) ITEMS INVOLVED:

see attached list.

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.1.2.2 d. (2)

Controls are approximately 34" from the front edge of the console. The maximum reach of the 5th percentile female adult is approximately 25".

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

C.R. Survey (R403)

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

5th percentile female adult operators are not accommodated.

k) REVIEW AND RECOMMENDATIONS: 1) From attached list, determine which controls affect operations or plant safety to the extent that they should be located lower on the board. Ensure controls are located no more than 23 inches from the front edge of the console.

2) Provide a stepstool and a hand rail so that all operators will be able to reach controls

Compare with previous study (see REC-26) reviews that 3rd percentile ESP operator could reach all controls on the MCB. 5th percentile female operator could reach all controls on the MCB. If this panel is not regularly operated.

NO ACTION

ESSEX HUMAN FACTORS PROJECT MANAGER

E. E. Elmann

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

D. J. Vorhies
WESTINGHOUSE PROGRAM COORDINATOR

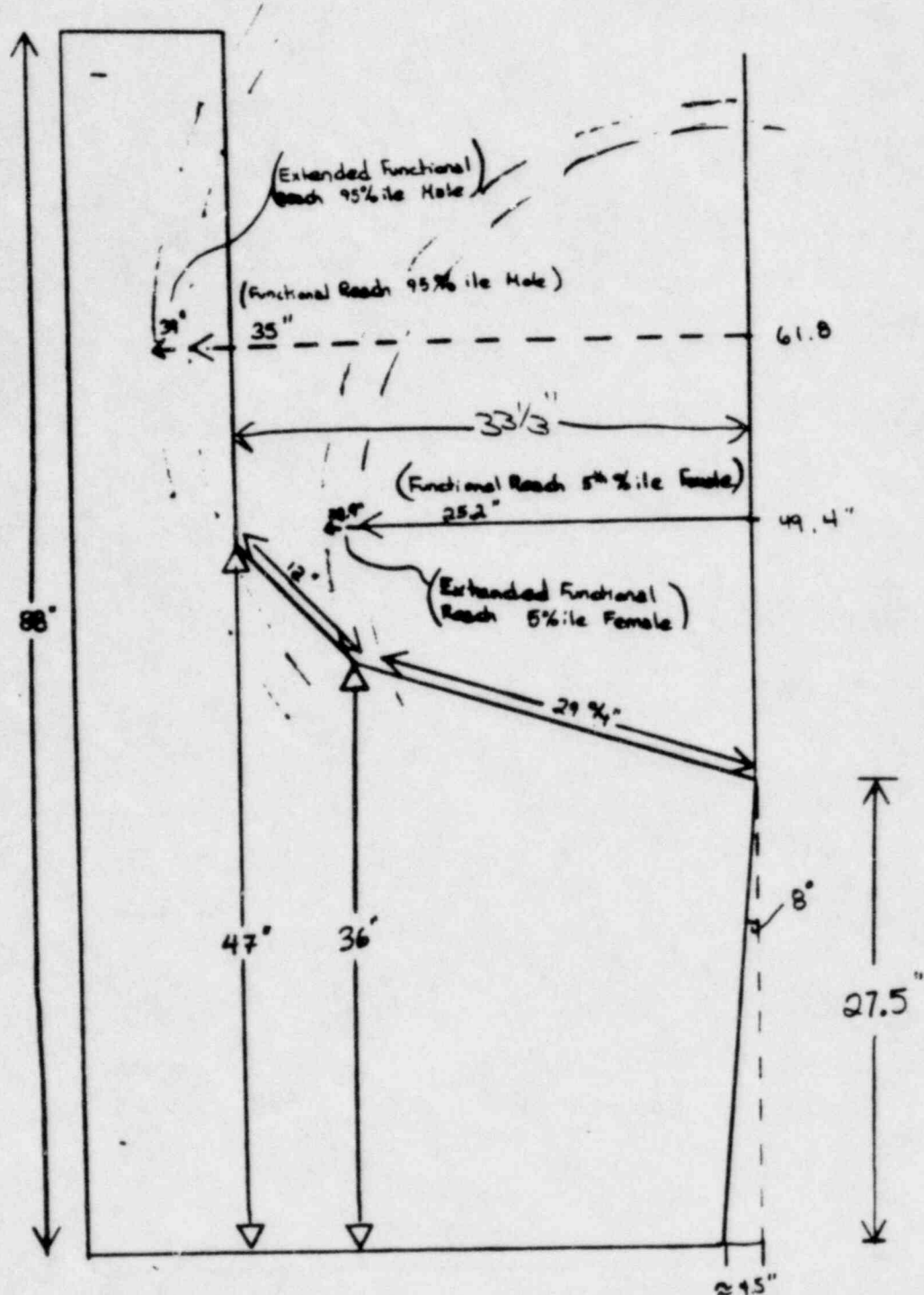
1) REVIEW AND DISPOSITION:

No Action

R. Martin 8/12/85
DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

E. F. Kuntz Jr. 7-15-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER

T. P. Noonan
DUQUESNE LIGHT COMPANY OPERATIONS MANAGER



Emergency Shutdown Panel
Side view

HED 2ESX - ¹⁴⁰⁸~~30~~

Controls are beyond the forward functional reach of the 5th percentile female adult.

ES1

ITEM NO

2 SVS * PCV101A, B, C	process controllers	119, 120, 121
2 SVS * PCV101A, B, C	transfer switches	119S, 120S, 121S
2 SVS * HCV 104	process controller	122
2 SVS * HCV 104	transfer switch	122S

ES2

2 CHS - FKV122	process controller; transfer switch	218; 218S
2 CHS - MOV311	control switch; pushbutton transfer	219; 219T
PRZR SI BLK RESET	control switch	220
STMLINE SI BLK RESET	selector switch	221
SIS BLK RESET	pushbutton transfer	220T
PRZR SI BLK RESET	control switch	222
STMLINE SI BLK RESET	selector switch	223
SIS BLK RESET	pushbutton transfer	222T
2 CHS - MOV 310	control switch; pushbutton transfer	224; 224T

ES3

2 CHS - PCV 145	process controller; transfer switch	317; 317S
2 CHS - MOV 100A, B	control switch; pushbutton transfer	318, 319 318S, 319S
2 RHS - FCV 605A	process controller; transfer switch	320, 320S

HED 2 ESX - ~~30~~
1408

Item NO.

ES3 - continued

2RHS - HCV 758A

process controller; transfer switch

321, 321S

2RHS - MOV 720A

control switch; pushbutton transfer

322; 322T

2RHS - MOV 750A

control switch; pushbutton transfer

323; 323T

ES-4

2RHS - FCV 605B

process controller; control switch

418, 418S

2RHS - HCV 758

process controller; control switch

419, 419S

2RHS - MOV 720B

control switch; pushbutton transfer

420; 420T

2RHS - MOV 750B

control switch; pushbutton transfer

421; 421T

Supply Breaker 2E7

cont. sw.; pushbutton transfer

415; 415T

Supply Breaker 2F7

cont. sw.; pushbutton transfer

417; 417T

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS - 2
PLANT/UNIT

b) ORIGINATOR: N K FURY c) HED NO.: 2***-1701

d) REVIEWED BY: *W. J. Catullo Jr.*
(Westinghouse) e) DATE: 11/8/84

[Signature]
(Essex)

f) HED TITLE: FAILURE OF EFFLUENT FLOW RECORDER PAPER

g) ITEMS INVOLVED:
EFFLUENT FLOW RECORDER DRIVE GEAR AND RECORDER PAPER ROLL GEAR.

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:
DURING A LIQUID RELEASE, THE EFFLUENT FLOW RECORDER PAPER
DID NOT ROTATE. THE RECORDER DRIVE GEARS AND THE RECORDER PAPER
ROLL GEAR DID NOT MESH PROPERLY.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER: LER 280 - 80002 LER Review DLCIN R401A


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:
PROPER OPERATION OF RECORDER PAPER WAS NOT ENSURED.

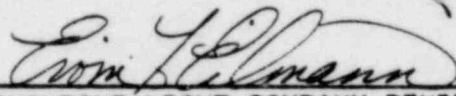
k) REVIEW AND RECOMMENDATIONS:

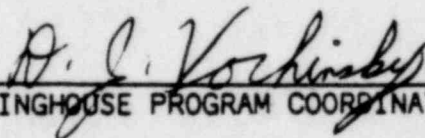
RETRAIN/REINSTRUCT PERSONNEL ON INSERTION OF RECORDER PAPER
CAUTION SHOULD BE ADDED TO THE EXISTING PROCEDURE ALERTING
PERSONNEL TO POSSIBLE PROBLEM.

- ADMINISTRATIVE CONTROLS ARE IN PLACE TO PREVENT OR REDUCE THE
LIKELIHOOD OF THIS PROBLEM.

- RECOMMEND NO ^{FURTHER} ACTION

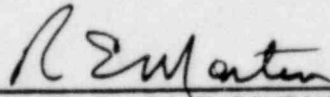

ESSEX HUMAN FACTORS PROJECT MANAGER

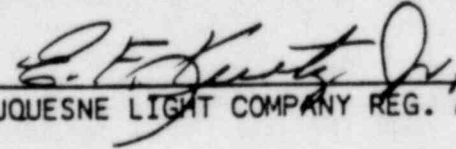

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

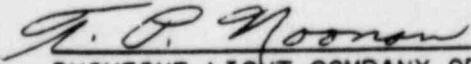

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Agree - no action required, operators
administratively monitor these recorders
and add paper or generate the appropriate
actions to have repairs made as necessary.


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BUPS-2
PLANT/UNIT

b) ORIGINATOR: N. KFSUEY

c) HED NO.: 2***-2001

d) REVIEWED BY: M. J. Catullo Jr.
(Westinghouse)

e) DATE: 11/8/84

T. J. V. [Signature]
(Essex)

f) HED TITLE: INCREASE IN STORM DRAIN ACTIVITY DUE TO LEAKS FROM
STRIPPER FEED STEAM HEATER.

g) ITEMS INVOLVED:

FOUR TUBES IN HEAT EXCHANGER BUNDLE 1-BR-E-10A
AUXILIARY STEAM DRAIN RECEIVER PUMPS

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

LEAKS FROM STRIPPER FEED STEAM HEATER, CAUSED BY LEAKING OF FOUR TUBES
IN THE HEAT EXCHANGER BUNDLE OF 1-BR-E-10A, RESULTED IN INCREASED
STORM DRAIN ACTIVITY. THE AUXILIARY STEAM DRAIN RECEIVER PUMPS FAILED
TO PREVENT THE RECEIVER FROM OVERFLOWING.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

LER 280-81054

LER REVIEW DLCIN R401A

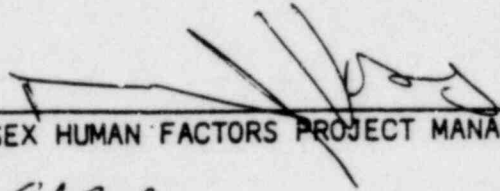
j) SPECIFIC HUMAN ERRORS(S) OR EQUIPMENT DESIGN PROBLEM:

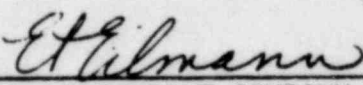
EQUIPMENT FAILURE RESULTING IN INCREASED STORM DRAIN ACTIVITY.

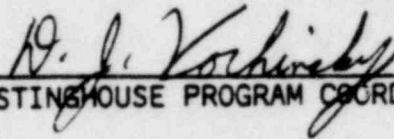
k) REVIEW AND RECOMMENDATIONS:

REVIEW INSTRUMENTATION FOR POSSIBLE IMPROVEMENTS

• EQUIPMENT FAILURE -- NOT APPLICABLE TO CRDR

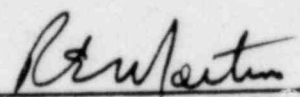

ESSEX HUMAN FACTORS PROJECT MANAGER

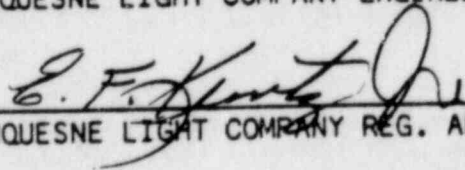

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

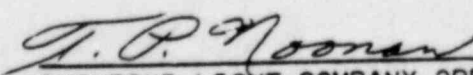

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Agree - no action required


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS-2

PLANT/UNIT

b) ORIGINATOR: MADELINE RYABY

c) HED NO.: 2***-2002

d) REVIEWED BY: W. J. Catullo
(Westinghouse)

e) DATE: OCT. 12, 1984

CR No. 2002
71

[Signature]
(Essex)

f) HED TITLE: CHARACTER DIMENSIONS AND SPACING.

g) ITEMS INVOLVED:

SEE ATTACHED LISTS

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

6.5.1.3.d CHARACTER DIMENSIONS AND SPACING -
(1) STROKE WIDTH-TO-CHARACTER-HEIGHT RATIOS
(2) LETTER WIDTH-TO-HEIGHT RATIOS
(3) NUMERAL WIDTH-TO-HEIGHT RATIOS
(4) MINIMUM SPACE BETWEEN CHARACTERS

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

DISPLAY SURVEYS: TP 5-1 B1.1

DLCIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:


CAN CAUSE ERROR IN READING DISPLAYS AND DELAYED OPERATOR RESPONSE.

k) REVIEW AND RECOMMENDATIONS:

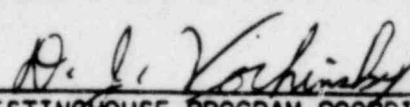
NEW SCALES WITH PROPER CHARACTER DIMENSIONS AND SPACING SHOULD BE INSTALLED.

- ITEMS 1101-1104 (LOAD TAP POSITIONS, X & Y WINDINGS) HAVE DARK LETTERING ON DARK BACKGROUND -- VERY DIFFICULT TO READ. ALL OTHERS ARE OK.
- RECOMMEND REPLACING ITEMS 1101-1104 WITH A MORE READABLE METER FACE (E.G. DARK LETTERING ON WHITE BACKGROUND).

NOTE: ITEMS 1101-1104 should be replaced because of dark lettering on dark background; character dimensions and spacing were found to be no problem.


ESSEX HUMAN FACTORS PROJECT MANAGER

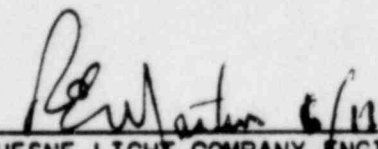

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

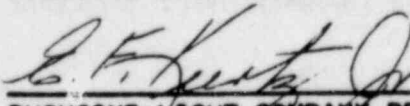

WESTINGHOUSE PROGRAM COORDINATOR

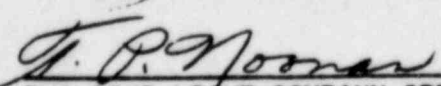
1) REVIEW AND DISPOSITION:

Recommend the items be ~~identical~~ ^{consistent with} to BU-1 due to the fact that the instrument is not safety related not used in safety related activities.

*Recommend no change
Not dynamic instrument
per*


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 5-31-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

7/24/85

RT recommends that items be consistent with those on unit 1. The black lettering on black background should not be a problem for the station operator.

SEE HED No. 2VC8-2205

NO ACTION

- (1) STROKE - WIDTH - TO - CHARACTER - HEIGHT RATIOS SHOULD BE BETWEEN 1:6 AND 1:8.

CIRCULAR METERS: BC 4 - 171 A & B DIESEL GEN SPEED

HAGAN MANUAL CONTROLLER SCALES: BA4 - 977; BA5 - 909, 139, 746, 761

TREND REORDERS: VA9 - 864 A & B; VB5 - 444 A & B; VC5 - 1018 A & B

- (2) LETTER WIDTH - TO - HEIGHT RATIOS SHOULD BE BETWEEN 1:1 AND 3:5.

CIRCULAR METERS: BC 4 - 171 A & B DIESEL GEN SPEED

- (3) NUMERAL WIDTH - TO - HEIGHT RATIOS SHOULD BE 3:5.

CIRCULAR METERS: BC 4 - 171 A & B DIESEL GEN SPEED

HAGAN MANUAL CONTROLLER SCALES: BAA - 977; BA5 - 909, 139, 746, 761

- (4) MINIMUM SPACE BETWEEN CHARACTERS SHOULD BE ONE STROKE WIDTH.

REPLACE

CIRCULAR METERS: VLB - 1101 - 1104 X & Y WINDING

HAGAN MANUAL CONTROLLER SCALES: BAA - 977; BA5 - 909, 139, 746, 761

TREND REORDERS: (HAGAN - WESTINGHOUSE) VA6 - 809, 972;

VA7 - 817, 818, 824; VAB - 831, 844, 845, 1016; VA9 - 863A, 863B

872, 1067, 48; VB6 - 448, 449, 458, 459; VB5 - 441A, 441B, 441C

441D, 442A, 443A, 443B, 443C, 443D, 442B; VLB - 276, 280A,

280B, 281, 282, 1058; VLB - 264B, 264A; AUX - 2HVS - FR 22,

2HVC - FR 21

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS - 2

PLANT/UNIT

b) ORIGINATOR: MADELINE RYABY

c) HED NO.: 2***-2003

d) REVIEWED BY:

W. J. Catullo
(Westinghouse)

e) DATE: OCT. 12. 1984

[Signature]
(Essex)

f) HED TITLE: GRADUATION HEIGHTS AS A FUNCTION OF VIEWING
DISTANCE

g) ITEMS INVOLVED:

CIRCULAR METERS AND CURVED SCALES; VERTICAL INDICATORS;
HORIZONTAL INDICATORS; CONTROLLERS; TREND REORDERS (EXCEPT
VAS: 1011-1015; VA9: 864 A & B; VB5: 444 A & B; VCS: 1018 A & B;
VCT: 249, 251, 252).

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

GRADUATION HEIGHTS AS A FUNCTION OF VIEWING DISTANCE
(PER 0700 GUIDELINES, 6.5.1.5.b.) DO NOT MEET REQUIRE-
MENTS.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

DISPLAYS SURVEY: TP 5.1 B1.1

DLCIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

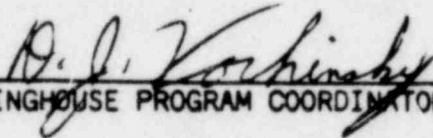
GRADUATIONS NOT OF RECOMMENDED HEIGHT MAY CAUSE
OPERATION ERROR IN READING AND DELAY IN RESPONSE
TIME.

k) REVIEW AND RECOMMENDATIONS:

Guideline 6.5.1.5 b does not take into consideration the trade-off between scale graduation length and thickness. The assumption is made that all scale markings will be very narrow (ie .0125" thickness). This assumption is incorrect, scale markings are in general much wider than .0125" and as such are adequately visible even though most markings do not meet the length criterion. No modification is recommended.

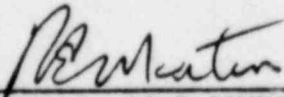

ESSEX HUMAN FACTORS PROJECT MANAGER

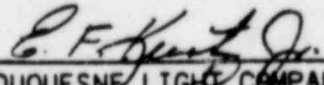

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

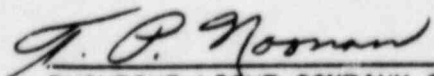

WESTINGHOUSE PROGRAM COORDINATOR

l) REVIEW AND DISPOSITION:

Agree - No Action


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 6-21-FS
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) BVPS - 2
PLANT/UNIT

5

b) ORIGINATOR: M. Francher c) HED NO.: 21/XX-2006

d) REVIEWED BY: H. I. Korhonen e) DATE: 1/29/85
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: Parameter is missing from display face

g) ITEMS INVOLVED:
(PSIG) TR Pressurized Pressure 2RCS - PR 444
(°F) TR Reactor Coolant loop 1, 2, 3 TR - 413
(PSIG) TR Steam Gen Pressure 2MSS PR - 475
(%) RWST level 2QSS LR - 100

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

Visual displays provided in the control room do not give operators all the information about system status and parameter values needed to meet task requirements [6.5.11b]

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:


Verification of task performance capability,
Suitability (R405) 6.2.1.2
& Validation (R406).

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

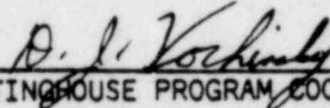
Operator may misinterpret displayed info

k) REVIEW AND RECOMMENDATIONS:

Appropriate Parameter
should be present on scale


ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

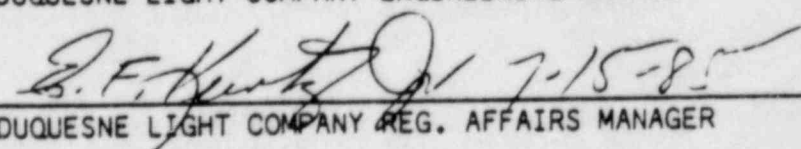

WESTINGHOUSE PROGRAM COORDINATOR

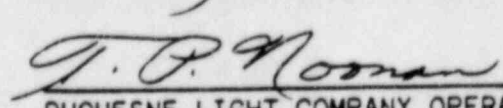
1) REVIEW AND DISPOSITION:

Not needed on recorder face - it ^{is} indicated
on recorder label. No action

7/24/85 - Recorder should be
available on recorder,
I will display on
scale face, information
needed is printed on
scale face but
present on PG-444.
The scale is to be
revised to be
more accurate.


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) BVPS-2
PLANT/UNITb) ORIGINATOR: M. Francherc) HED NO.: 2VA5-2009d) REVIEWED BY: A. J. Kishaly
(Westinghouse)e) DATE: 3/29/85T. J. Jones
(Essex)f) HED TITLE: Lowest value on scale is not numbered.g) ITEMS INVOLVED: Reactor Containment Pressure Indicators
2 LMS * PI 950, 951, 952, 953h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.5.1.2

Existing scale is not numbered so that readings are related to operator tasks in a direct way. ie. Bottom value of -5 psig does not appear on scale face. Numbering should start with -5 psig but now starts at zero (0) psig.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Validation of Control Room Functions (R406)

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Operator may respond incorrectly

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2VC8-2011

d) REVIEWED BY: A. J. Vachinsky e) DATE: 3/19/85
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: Display scales does not match degree of precision needed by operator.

g) ITEMS INVOLVED: Emergency Generator 2-1 Wattmeter
" " 2-2 "

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.5.1.2 a. b.

The scale units are not consistent with the degree of precision and accuracy needed by the operator. Also this display does not indicate values in a form immediately usable by the operator.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Validation of Control Room Functions (R406)

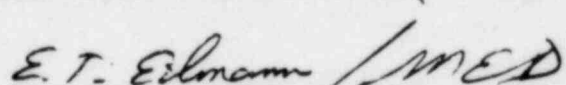
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

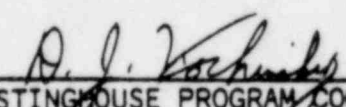
Operator may have difficulty reading or interpreting display.

k) REVIEW AND RECOMMENDATIONS:

The existing scale ranges from 0-10 Megawatts. The procedures ask for readings in Kilowatts. ~~Since the highest probable reading for the generator is \approx 5000 kilowatts, it is suggested that a kilowatt meter be installed with a 0-6,000 kw range.~~ RT suggests that the existing scale be changed to read 0-10,000 kilowatts so that it agrees with the procedures (kilowatts) and that normal operating position (reading) is straight up on the scale. (50 i.e., change from Megawatts to kilowatts.


ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

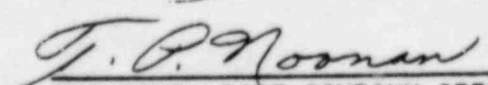

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

SUB has determined that 5 KW is actual range of meter face. Meter should be 0-5000kw in any case.


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 5-21-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: - M. Francher c) HED NO.: 2VCL-2015

d) REVIEWED BY: D. J. Korhonen e) DATE: 5/2/85
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: Setpoint asked for is outside of
display range

g) ITEMS INVOLVED: S.G. level indicator
2FWSX LI 474, 484, 494

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.5.1.2 a.

Element table asks for reading of >100%, scale range is currently 0-100%. Scale units are not consistent with the degree of precision and accuracy needed by operator.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Verification of Task Performance Capabilities
- Suitability (R405)

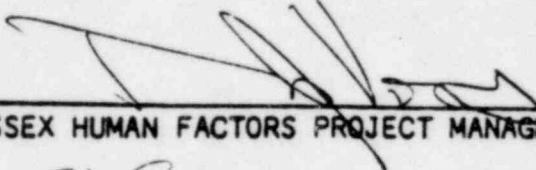
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Operators action may be delayed.

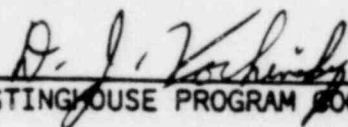
k) REVIEW AND RECOMMENDATIONS: Plant procedures direct operators to ensure Steam Generators are full, however the Element table erroneously asks the operator for a reading that cannot be read. (>100%). Establish what is the reading operators need to read, and ensure both scale face and procedures are in agreement with the requirement.

The actual need, ^{according to procedure} is to establish that SG is full. 100% indicator is full. Both procedure & indicator are appropriate.

NO ACTION


ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

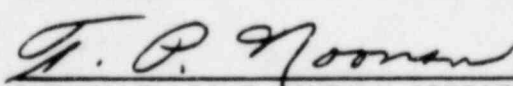

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

No Action


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: - M. Francher c) HED NO.: 2VCT-2016

d) REVIEWED BY: D. J. Vachinsky e) DATE: 5/2/85
(Westinghouse)

~~Voss~~
(Essex)

f) HED TITLE: Percent parameter is missing from
display face

g) ITEMS INVOLVED: Governor Valves 1, 2, 3, 4
#258

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.5.1.1 b

The visual display does not provide complete information.
0-100 is indicated but the parameter (%) is missing.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Verification of Task Performance Capabilities
- Suitability (R405)

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:


May result in operator delay
or misreading.

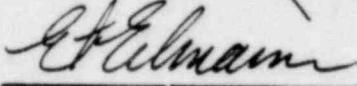
k) REVIEW AND RECOMMENDATIONS: Provide a new scale face that includes a per cent parameter.

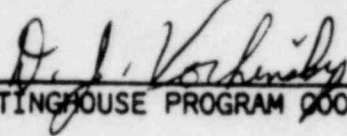
As suggested above.

NOTE: OPS felt this was not needed, NEO agrees.

No Action recommended.

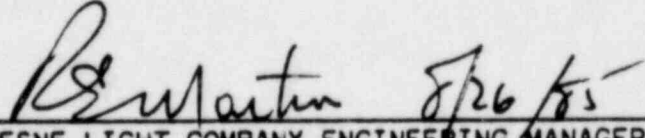

ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

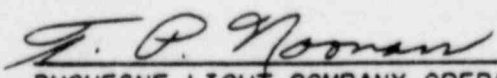

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Agree No action


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) EVPS-2
PLANT/UNIT

b) ORIGINATOR: N KAWRY c) HED NO.: 2***-2101

d) REVIEWED BY: *N. J. Catullo Jr.*
(Westinghouse) e) DATE: 11/8/84

[Signature]
(Essex)

f) HED TITLE: FAILURE TO RESET ALARM

g) ITEMS INVOLVED:

LOW AIR PRESSURE ALARM ON NO 1 AIR BANK FOR NO. 1 EDG

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

OPERATOR failed to reset local low air pressure alarm after repressurizing.

Alarms that have cleared should initiate an audible signal and activate the alarmed and acknowledged visual tile to provide positive confirmation. 6.3.1.5.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER: LER: 280-82093 LER Review DLIN R401A

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:


OPERATOR failure to reset alarm. (Error of Omission)

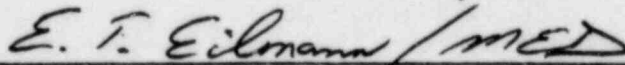
k) REVIEW AND RECOMMENDATIONS:

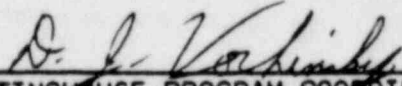
~~install a dedicated hangback per guideline 6.3.5.6.~~

Present system provides for an aural & visual alarm
in the control room when a function is cleared.

No Action

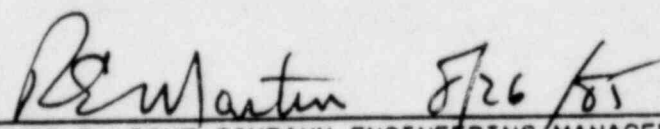

ESSEX HUMAN FACTORS PROJECT MANAGER

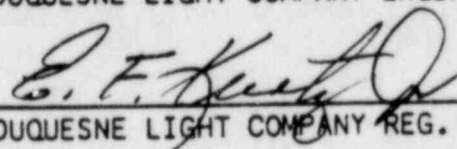

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Agree No action


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 7-26-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BUPS-2
PLANT/UNIT

b) ORIGINATOR: N. K. FURY c) HED NO.: 2***-2102

d) REVIEWED BY: N. F. Catell
(Westinghouse) e) DATE: 11/8/84

F. Voss
(Essex)

f) HED TITLE: DIESEL FIRE PUMP FUEL OIL LEVEL LESS THAN REQUIRED

g) ITEMS INVOLVED:

DIESEL FIRE PUMP

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

FUEL OIL LEVEL FOR THE DIESEL FIRE PUMP WAS FOUND TO BE LESS THAN THE TECHNICAL SPECIFICATION MINIMUM LEVEL.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER: LER 280-81076 LER Review DLCIN R401A.


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

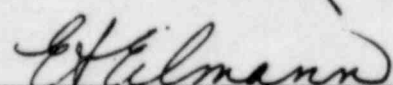
ADMINISTRATIVE OVERSIGHT ERROR OF OMISSION

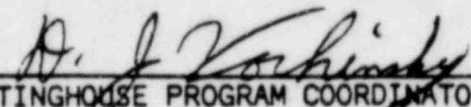
k) REVIEW AND RECOMMENDATIONS:

INSTALL LOW VOLTAGE ALARM / FLAME OUT LOG SHEET

NOT APPLICABLE TO CRDR, ADMINISTRATIVE OVERSIGHT.

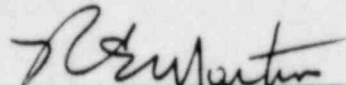

ESSEX HUMAN FACTORS PROJECT MANAGER

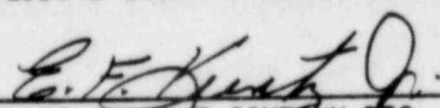

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

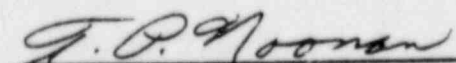

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Agree - no action required, BU-2 does not have
a diesel fire pump.


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BEAVER VALLEY POWER STATION - UNIT 2
PLANT/UNIT

b) ORIGINATOR: - Margery Davidson

c) HED NO.: 2VA5-2103

d) REVIEWED BY: W. J. Catullo Jr.
(Westinghouse)

e) DATE: 7/31/84

[Signature]
(Essex)

f) HED TITLE: No separate First-Out Panels for The Reactor System or the Turbine - Generator System

g) ITEMS INVOLVED:
Annunciators

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.3.1.3a(1) and 6.3.1.3b

^{W.T.T.}
There is not a separate first-out panel for the reactor system. The Reactor trip, Turbine trip and Generator trip are all on Annunciator panel A-5.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Annunciator Survey - TP 3.1B3.1 and .2 DLCIU R403

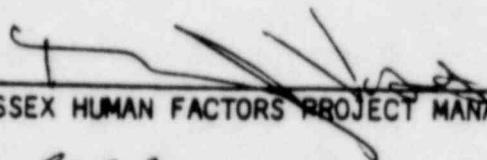
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

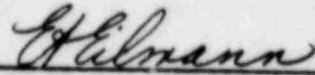
Inability to quickly recognize and identify reactor system problems.

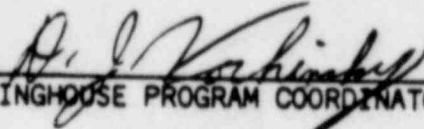
k) REVIEW AND RECOMMENDATIONS:

Place the annunciator tiles for Reactor trip, Turbine trip and Simulator trip on separate annunciator panels.

- ANN. PANEL A5 IS A COMBINED FIRST-OUT PANEL.
- SEPARATE PANELS NOT NEEDED DUE TO CENTRAL LOCATION OF EXISTING FIRST-OUT PANEL. ALSO, ORDER OF INCOMING ALARMS IS SHOWN ON CRTs AND HARD COPY PRINTOUT.
- RECOMMEND NO ACTION

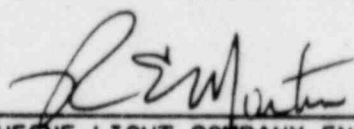

ESSEX HUMAN FACTORS PROJECT MANAGER

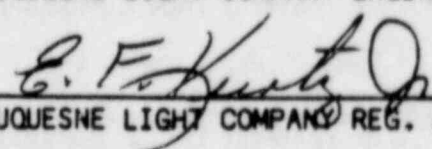

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

No Action Required - even though the various annunciators concerning trips are located on the same panel, their method of alarming designates which annunciator (event) caused the actuation.


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BEAVER VALLEY POWER STATION - UNIT 2
PLANT/UNIT

b) ORIGINATOR: Margery Davidson c) HED NO.: 2YA5-2104

d) REVIEWED BY: W. J. Catullo Jr. e) DATE: 7/31/84
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: First Out Annunciator Tiles have dual messages

g) ITEMS INVOLVED:
Annunciator Tiles, Pnl VA5

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.3.1.3a(2)

Tiles 2D, 3D and 4D on panel A5 have dual meanings.

2D
SGA LOW LEVEL/
LOOP A FD WTR
FLOW LOW
REACTOR TRIP

3D
SG B LOW LEVEL/
LOOP B FD WTR
FLOW LOW
REACTOR TRIP

4D
SG C LOW LEVEL/
LOOP C FD WTR
FLOW LOW
REACTOR TRIP

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Annunciator Survey TP3.1B3.4 DLCIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

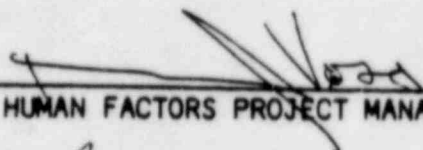
Inability to discern actual problem by looking at tile.

k) REVIEW AND RECOMMENDATIONS:

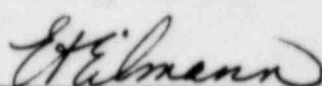
Make separate annunciator tiles for all those that are dual meaning tiles.

• THIS IS NOT AN HED. THE MESSAGES ARE ACTUALLY SINGLE TRIP EVENTS (COINCIDENCE TRIP SIGNALS)

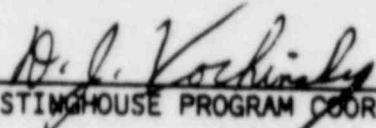
• NO ACTION



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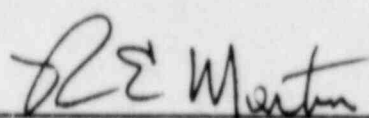
DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER



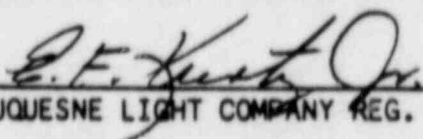
WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

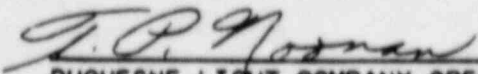
No action required.



DUQUESNE LIGHT COMPANY ENGINEERING MANAGER



DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER



DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BEAVER VALLEY POWER STATION - UNIT 2
PLANT/UNIT

b) ORIGINATOR: Margery Davidson c) HED NO.: 2VXX-2105

d) REVIEWED BY: W.J. Catullo Jr. e) DATE: 7/3/84
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: File Designation Coordinate Location is not
at left and top sides

g) ITEMS INVOLVED:

Annunciator coordinate designators

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.3.3.3c(2)

Coordinate designators are located at the left and bottom sides of the ALBs. They are preferred at the left and top sides.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Annunciator Survey TP 3.1B3.34 DLCIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

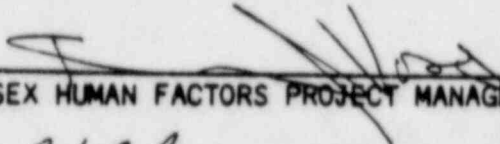
Inability to quickly identify a file

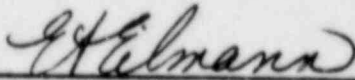
k) REVIEW AND RECOMMENDATIONS:

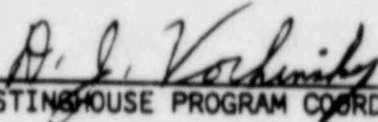
Move the ALB coordinate designators on the bottom to the top of the ALBs.

* PANEL IS ABOVE THE LINE OF SIGHT. DESIGNATORS WOULD BE HARDER TO SEE IF MOVED TO THE TOP OF PANEL.

NO ACTION

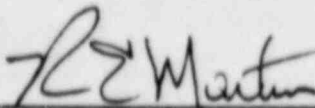

ESSEX HUMAN FACTORS PROJECT MANAGER

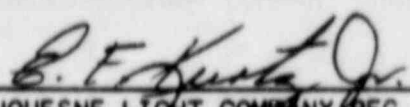

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

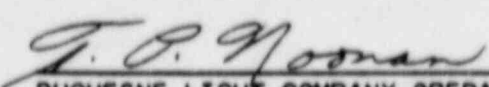

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Agree
No action


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BEAVER VALLEY POWER STATION - UNIT 2
PLANT/UNIT

b) ORIGINATOR: - Margery Davidson c) HED NO.: 2V** - 2106

d) REVIEWED BY: W. J. Butcher Jr e) DATE: 7/31/8-
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: Number of tiles per ALB is greater than 50.

g) ITEMS INVOLVED:

Annunciators, PNL VB6 (A4), PNL VB5 (A5), PNL VC6 (A6),
PNL VC7 (A7), PNL VC8 (A8)

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.3.3.3d(1)

The number of tiles per ALB exceeds 50 for the following annunciator sets:

AB - 80 (8x10)	A6 - 96 (8x12)
A7 - 88 (8x11)	A4 - 72 (8x9)
A5 - 64 (8x8)	

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Annunciator Survey TP 3.1B3.36 DLCIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Difficulty isolating a particular problem tile.

k) REVIEW AND RECOMMENDATIONS:

Divide the ALBs that exceed 50 tiles per matrix into two functional groups and arrange on 2 ALBs.

① • INVESTIGATE SWITCHING TO SMALLER ALBs, or AT LEAST SOME ENHANCEMENT TECHNIQUE WHICH WOULD EFFECTIVELY DIVIDE LARGE BOARD INTO TWO SMALLER ONES.

② • Based on core team discussions; although not in conformance with O700, this may not be a problem at B.V. because the operator relies more directly on the CRT message than on the annunciator tile.

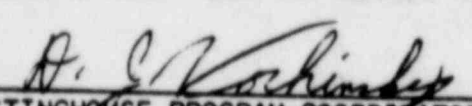
~~NO ACTION~~ MED

NO ACTION

Unit 1 HEDs - 68 & 70


ESSEX HUMAN FACTORS PROJECT MANAGER

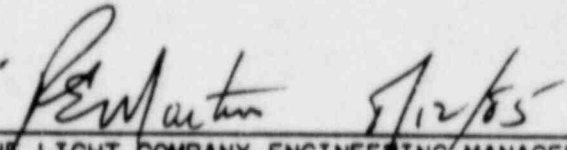

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Agree No Action

RT continues to recommend
an enhancement technique to
break up the large ALBs
to facilitate pattern recognition.
See UCC 6.3.3.3 d.1 (7/29/85)


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 7-26-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BEAVER VALLEY POWER STATION - UNIT 2
PLANT/UNIT

2BSP-2107

b) ORIGINATOR: Margery Davidson

c) HED NO.: [REDACTED]

d) REVIEWED BY: [Signature]

(Westinghouse)

e) DATE: 7/31/81

[Signature]
(Essex)

f) HED TITLE: Blank tiles on ALBs are illuminated

g) ITEMS INVOLVED:

Annunciator Visual Panel A10

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

6.3.3.3 f.

There are thirteen illuminated blank annunciator tiles on ALB A10

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Annunciator Survey TP 3.1B3.24A DLCIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Distraction due to a blank tile being lit.

Mistaking one annunciator message for another.

k) REVIEW AND RECOMMENDATIONS:

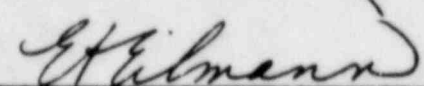
Determine if lit annunciator tiles are in a test mode. If not, make sure that blank tiles do not light up.

- LIT TILES ARE IN TEST MODE, THEY DON'T LIGHT UNDER NON-TEST CONDITIONS


• NO ACTION



ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER



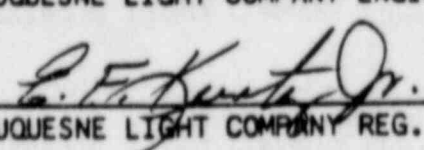
WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

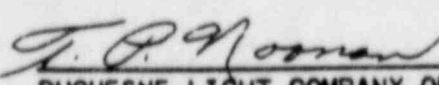
Agree - no action



DUQUESNE LIGHT COMPANY ENGINEERING MANAGER



DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER



DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BEAVER VALLEY POWER STATION - UNIT 2
PLANT/UNIT

b) ORIGINATOR: - Margery Davidson c) HED NO.: 2VXX-2108

d) REVIEWED BY: *[Signature]* e) DATE: 7/31/84
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: Number of Lines Per tile exceeds Three

g) ITEMS INVOLVED:
Annunciator Legends

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.3.3.4a
Many of the tile legends contain lengthy messages covering four lines of text

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:
Annunciator Survey TP 3.1/3.30 DLGIN 12403

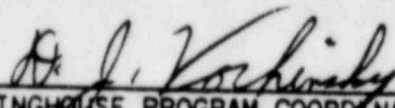
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:
Difficulty reading and understanding lengthy message, especially if it must be done quickly.

k) REVIEW AND RECOMMENDATIONS:

- Revise tile messages using concise, standardized acronyms.
- Reduce number of lines to three or less where possible.


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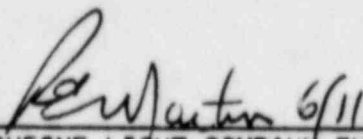

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

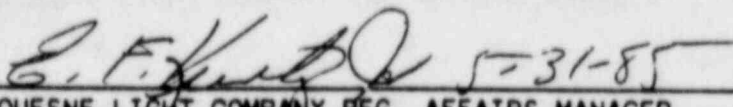

WESTINGHOUSE PROGRAM COORDINATOR

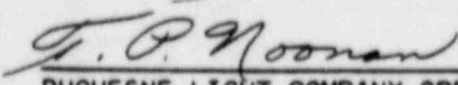
1) REVIEW AND DISPOSITION:

0700 Para 6.3.3.4 (a) does not specify no. of lines but concise statements. Annunciations messages meet this acceptance criteria. No change required.

RT 7/29/85 recommends - revising tile messages where possible by using concise standardized acronyms and abbreviations, this would make the lines more easily understood (readable) allowing operator to process information more quickly. T


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BEAVER VALLEY POWER STATION - UNIT 2
PLANT/UNIT

b) ORIGINATOR: Margery Davidson c) HED NO.: 2VXX-2109

d) REVIEWED BY: W. J. Catlett Jr. e) DATE: 7/31/84
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: Life Legend Specificity - Dual Meaning Alarms

g) ITEMS INVOLVED:
Annunciator Life Legends

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.3.3.4c

For many annunciator tiles, one alarm is used to address more than one condition. (See Attached List.) Dual-meaning alarms

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:
Annunciator Survey TP 3.1B3.31 DLCIN R453


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:
Confusion regarding actual condition.

k) REVIEW AND RECOMMENDATIONS:

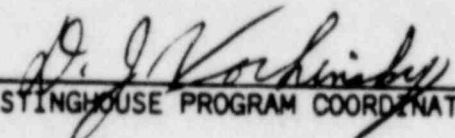
Rewrite annunciator tiles to assure that only one condition is addressed per tile.

- BV-2 PHILOSOPHY IS TO HAVE GROUP ALARMS W/ EACH INDIVIDUAL ALARM POINT COMING UP ON THE CRT. CRT SUPPLIES DETAILS OF ALARM CONDITION

NO ACTION


ESSEX HUMAN FACTORS PROJECT MANAGER

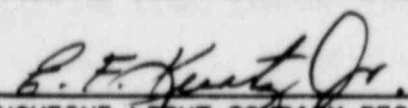

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

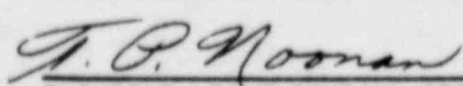

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Agree - no action


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

6.3.1.3a (2)

6.3.3.4C

HEC# 2V** - 3109

On Annunciator 5, the following tiles combine automatic reactor trip function messages:

2D

SG A LOW LEVEL/
LOOP A FD WTR
FLOW LOW
REACTOR TRIP

3D

SG B LOW LEVEL/
LOOP B FD WTR
FLOW LOW
REACTOR TRIP

4D

SG C LOW LEVEL/
LOOP C FD WTR
FLOW LOW
REACTOR TRIP

6.3.3.4C

Tile legends do not always address specific conditions - many have dual meanings:

ANNUNCIATOR A1

1D

EMERGENCY
LT6 BAT
OPERATION/
LOSS OF DC

4D

SAFETY INJECTION
PUMP
AUTO-START/
AUTO-STOP

1E

CONTAINMENT
PARTIAL PRESS
HIGH/LOW

1F

CONTAINMENT AIR
AVERAGE TEMP
HIGH/LOW

3F

RECIRC SPRAY
PUMP
AUTO-START/
AUTO-STOP

4F

SERVICE WATER
PUMP
AUTO-START/
AUTO-STOP

1G

NEUTRON SHIELD
EXPANSION TANK
LEVEL LOW/
TEMP HIGH

2G

INCORE INST RM/
CNMT SUMP
LEVEL HIGH/
VALVE NOT RESET

ANNUNCIATOR A2

3C

LIQUID
WASTE DRAIN
TANK LEVEL
HIGH/LOW

4C

REACTOR COOLANT
PUMP BUS
UNDERFREQUENCY/
UNDERVOLTAGE

5C

REACTOR COOLANT
PUMP VIBRATION
ALERT/DANGER

ANNUNCIATOR
A2

3D
CHARGING PUMP
AUTO-START/
AUTO-STOP

SD
REACTOR COOLANT
PUMP SEAL
VENT POT
LEVEL HIGH/LOW

ZE
BORIC ACID
BLENDER
INLET/OUTLET
DEV FROM SP

ZF
BORIC ACID
TANKS/
TRANSFER PUMPS
TROUBLE

1H
H2 ANALYZER/
RECOMBINER
LOCAL PANEL
TROUBLE

ANNUNCIATOR
A3

RAMINGS VOID,
PHOTOMOSAK
TURE)

ANNUNCIATOR
A41B
PRESSURIZER
CONTROL
LEVEL
HIGH/LOW2B
PRESSURIZER
LEVEL
HIGH/LOW1C
PRESSURIZER
CONTROL
PRESS DEVIATION
HIGH/LOW1D
PRESSURIZER
CONTROL
PRESS DEVIATION
HIGH/LOW1E
PRESSURIZER
CONTROL
PRESS DEVIATION
HIGH/LOWANNUNCIATOR
A62A
REFUEL CAVITY
LEVEL HIGH-LOW/
TEMP HIGH11A
AUX FW PUMP
AUTO-START/
AUTO-STOP1B
SPENT FUEL BOL
LEVEL
HIGH/LOW9D
STM GEN A
LEVEL
HIGH-HIGH/
LOW/LOW-LOW10D
STM GEN B
LEVEL
HIGH-HIGH/
LOW/LOW-LOW11D
STM GEN C
LEVEL
HIGH-HIGH/
LOW/LOW-LOW3F
CONDENSER
HOTWELL
LEVEL
HIGH/LOW7F
4TH POINT LP
FW HTR 24A/B
LEVEL
HIGH/LOW1G
PRI COMP
COOLING PUMP
AUTO-START6G
CONDENSATE RCVR
TFR TK 25/23
LEVEL
HI-HI/LOW/LOW7G
5TH POINT LP
FW HTR 25A/B
LEVEL
HIGH/LOWANNUNCIATOR
A74H
GENERATOR FIELD
OVERCURRENT/
GND/ LOSS OF
GND PROTECTION

ANNUNCIATOR
A-8

4A
DIESEL GEN 2-1
ACB 2E10
AUTO-CLOSE/
AUTO-TRIP -

5A
DIESEL GEN 2-2
ACB 2F10
AUTO-CLOSE/
AUTO-TRIP

4D
DIESEL GEN 2-1
LOSS OF FIELD/
LOW EXCITATION

5D
DIESEL GEN 2-2
LOSS OF FIELD/
LOW EXCITATION

ANNUNCIATOR
A10

3B
CONTROL BLDG
AIR EXHAUST
FAN
AUTO-START/STOP

4B
CONTROL BLDG
AIR SUPPLY
FAN
AUTO-START/STOP

5B
CONTROL BLDG
INST & RELAY RM
TEMPERATURE
HIGH/LOW

2D
LEAK COLLECTION
AIR EXHAUST
FLOW
HIGH/LOW

2F PIPE
TUNNEL
TEMPERATURE
HIGH/LOW

5F
EMERGENCY SWGR
VENTILATION
AUTO-START/
AUTO-STOP

6F
EMERGENCY SWGR
SUPPLY
TEMPERATURE
HIGH/LOW

1G
CABLE VAULT &
ROD CONTROL AREA
A/C UNIT
AUTO-START/STOP

5H
INIT OF SEISMIC
EXCEED PRESET
AND/OR SPECTRAL
ACCELERATIONS

7H
BATTERY ROOM
EXHAUST FAN
AUTO-START/
AUTO-STOP

ANNUNCIATOR
A11

5G
CRDM
SHROUD FAN
AUTO-START/
AUTO-STOP

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BEAVER VALLEY POWER STATION - UNIT 2
PLANT/UNIT

b) ORIGINATOR: Margery Davidson c) HED NO.: 2VCX-2110

d) REVIEWED BY: M.J. Catello Jr. e) DATE: 7/31/84
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: Visual Tile Type Style on Annunciators - not engraved.

g) ITEMS INVOLVED:

PNL VC7 (A7) & PNL VC8 (A8)

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.3.3.5c (1)

There are three handwritten tiles on Annunciator A7. They are written on white tape and obscure the illuminated tile. Similarly, there is one handwritten tile on AB:

480 r BUS
23-2K
TROUBLE

SYS STA SERV
TEMP LA
LTC A TEND
POSITION

STA SERV XRM
2B LIE AT
END POS

SYS STA SERV
TEMP 2A/2B
PRESS RELIEF
DAMAGE OPER

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

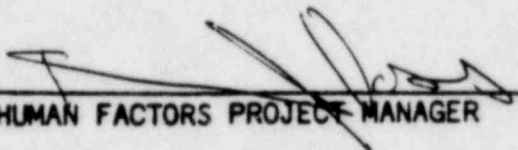
Annunciator Survey TP3.1B3.28 DLGIN R403

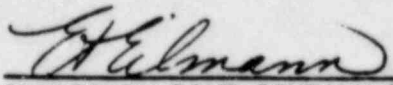
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

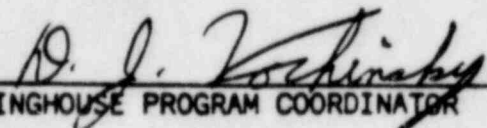
Not being aware that an annunciator tile was lit.

k) REVIEW AND RECOMMENDATIONS:

- Replace handwritten tiles with permanent, engraved tiles.*
- THIS WILL BE FIXED. PHOTO WAS TAKEN BEFORE ACTUAL ENGRAVED TILES WERE INSTALLED.*
- NO FURTHER ACTION REQUIRED.*

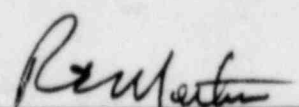

ESSEX HUMAN FACTORS PROJECT MANAGER

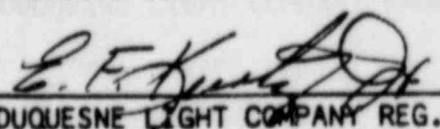

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

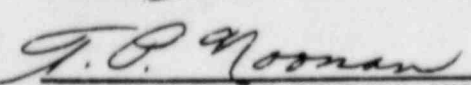

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Agree - no action required.


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BEAVER VALLEY POWER STATION - UNIT 2
PLANT/UNIT

b) ORIGINATOR: Margery Davidson c) HED NO.: 2VXX-2111

d) REVIEWED BY: M. J. Catullo e) DATE: 7/31/84
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: No Demarcation Lines enclosing functionally
related tiles

g) ITEMS INVOLVED:
Annunciators

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.6.6.2a(1)
Demarcation lines are not used to enclose functionally related tiles

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:
Annunciator Survey TP 3.1B3.39 §.40 DLCINR403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Inability to isolate a problem to a particular system or associated set of controls or displays.


Difficulty trouble-shooting or diagnosing a problem flagged by an annunciator.

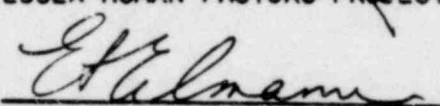
k) REVIEW AND RECOMMENDATIONS:

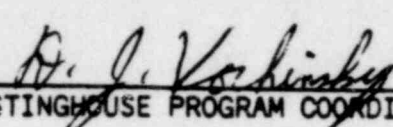
Demarcation lines should be used to separate types of annunciator messages.

• DEMARCATION IS NOT APPROPRIATE TO WAY ANNUNCIATORS ARE USED. ANNUNCIATORS ARE ALREADY FUNCTIONALLY GROUPED, DEMARCATION IS NOT AN OPERATOR AID.

• NO ACTION

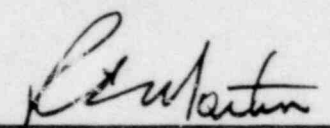

ESSEX HUMAN FACTORS PROJECT MANAGER

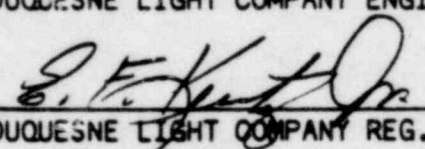

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Agree - no action required


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BEAVER VALLEY POWER STATION - UNIT 2
PLANT/UNIT

b) ORIGINATOR: - Margery Davidson c) HED NO.: 2YXX-2112

d) REVIEWED BY: *M. Catullo* e) DATE: 7/31/84
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: Letter Dimensions and Spacing on ALB tile engraving
do not meet criteria

g) ITEMS INVOLVED:
Annunciator characters

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.3.3.5 d(1)
Stroke-width to character-height ratio exceeds 1:8. (It is 1:9.3)

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Annunciator Survey TP3.1B1.1 DLCIN R403


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

The letters will be difficult to read from some positions in the control room

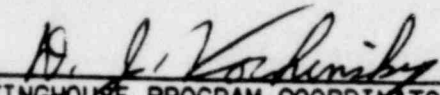
k) REVIEW AND RECOMMENDATIONS:

Replace tiles with those containing characters that correspond to 0700-specified stroke-width to character-height ratios.

OK


ESSEX HUMAN FACTORS PROJECT MANAGER

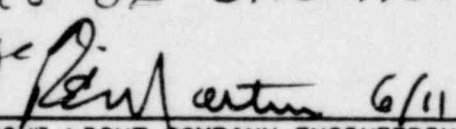

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

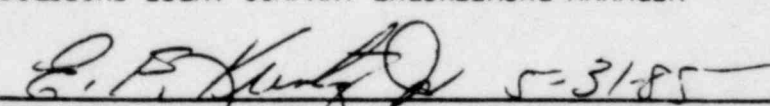

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

0700 PROVIDES GUIDANCE FOR RATIOS ~~(1.00)~~
BU-2 DEVIATES FROM GUIDANCE BY 16%. BU-2
IS CONSISTENT W/BU-1. INCORPORATION OF 0700
GUIDANCE ON A STRICT SENSE WOULD ~~ADD~~
CROWD LETTERING MAKING ALARMS DIFFICULT
TO READ & POSSIBLY IMPAIR SAFETY RELATED
EVALUATIONS/APPRAISALS OF SITUATIONS

No change recommended


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BEAVER VALLEY POWER STATION - UNIT 2
PLANT/UNIT

b) ORIGINATOR: Margery Davidson c) HED NO.: 2YXX-2113

d) REVIEWED BY: W. F. Esteloff e) DATE: 7/31/84
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: Letter Dimensions and Spacing between words do
not meet criteria

g) ITEMS INVOLVED:

Annunciator Legends

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.3.35d(5) (.19" apart)

Words on the annunciator legends are placed too close together, given the character width (.19").

The minimum space between words should be the width of one character.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Annunciator Survey TP 3.1B1.1 DLCIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Difficulty interpreting acronyms and words on tiles.


k) REVIEW AND RECOMMENDATIONS:

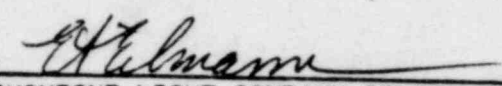
Remake tiles assuming that words are placed the width of one character apart. (APPROXIMATELY)


OK

Tiles are legible, operators had no problem reading during validation; also, CRT will be used.

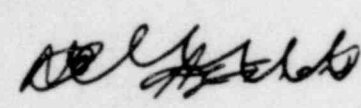
NO ACTION

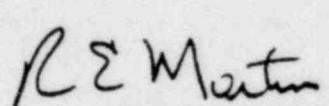

ESSEX HUMAN FACTORS PROJECT MANAGER

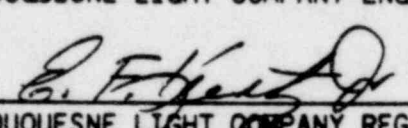

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

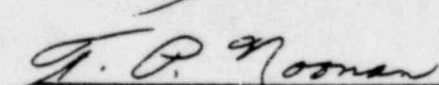

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

 No action


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 6-28-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) BEAVER VALLEY POWER STATION-UNIT 2
PLANT/UNIT

b) ORIGINATOR: Margery Davidson

c) HED NO.: 2VXX-2114

d) REVIEWED BY:

W. J. Catullo
(Westinghouse)

e) DATE: 7/31/84

[Signature]
(Essex)

f) HED TITLE:

Letter Dimensions and Spacing between legend

lines do not meet criteria

g) ITEMS INVOLVED:

Annunciator Legends

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

6.3.3.5d(6)

Legend lines on annunciators are placed too close together (.09" apart)
given the character height (.28").

Minimum space between lines should be one half the character
height (.14).

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Annunciator Survey TP 3.1B1.1 DLCIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:


Difficulty reading annunciator legends from a distance.

k) REVIEW AND RECOMMENDATIONS:

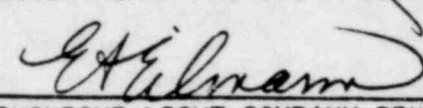
If annunciator tiles are revised, there should be more space between lines. (3 LINES PER TILE)

OK
Tiles are legible, SEE # 2V** - 2113

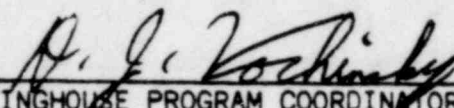
NO ACTION



ESSEX HUMAN FACTORS PROJECT MANAGER



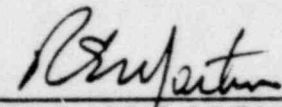
DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER




WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

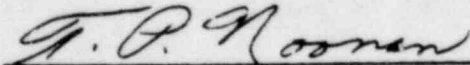
No Action.



DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 6-28-85

DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER



DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BUPS/2
PLANT/UNIT

b) ORIGINATOR: - J Goodson c) HED NO.: 2178-2115

d) REVIEWED BY: W. J. Catello Jr
(Westinghouse) e) DATE: 10/15/84

[Signature]
(Essex)

f) HED TITLE: No levels of priority coding

g) ITEMS INVOLVED:

Annunciators

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.3.1.4 A (1) & (2)

There are no priority levels based on a continuum
of importance.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

Control room survey, Annunciator System TP 3.1 B3.5

DLCIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Delayed response - if high priority alarms are
concurrent with low-priority alarms and there's no way of
determining which should be responded to first.

k) REVIEW AND RECOMMENDATIONS:

Implement prioritization system with 2 priority levels using visual coding (color, position, shape, symbols) and auditory coding.

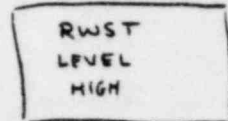
(Ref: Exhibit 6.3-3 example of prioritization

Guideline 6.2.2.3 auditory coding techniques)

• USING TWO PRIORITY LEVELS (FIRST AND SECOND) CODE THE ANNUNCIATOR BOXES; e.g.



(first priority)



(second priority)

- All first out alarms are grouped on ANN A5.
- All radiation alarms are grouped on ANN A4.
- By procedure, operator must take action on all alarms before clearing.

NO ACTION

Unit 1 HED No. 57

ESSEX HUMAN FACTORS PROJECT MANAGER

E.T. Eilerman / MED

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

D. J. Korhonen

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Agree No action

R. E. Martin 8/2/85

DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

B. F. Kuntz 7-26-85

DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER

T. P. Noonan

DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS/2
PLANT/UNIT

b) ORIGINATOR: -J Goodson

c) HED NO.: 2V** - 2/16

d) REVIEWED BY: *M. J. Patullo*
(Westinghouse)

e) DATE: 10/15/84

[Signature]
(Essex)

f) HED TITLE: Some ALBs can't be read from associated
acknowledge control.

g) ITEMS INVOLVED:

A12, A6 can't be read from 166

A8, A9 can't be read from Panel C acknowledge control.

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.3.3.5.a.(1)

Tile lettering is .28" therefore maximum viewing distance from annunciator response station is 70"

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Control room survey, Annunciator system TP 3.1 B3.23

DLCIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Delayed response - time required in verifying message which can't be read accurately.


Incorrect response - resulting from misinterpretation of tile

k) REVIEW AND RECOMMENDATIONS:

Make each acknowledge station in section C specific only to those ALBs which can be read from it.

NOTE: A CHANGE TO RESOLVE THIS DISCREPANCY WAS PREVIOUSLY APPROVED AND WILL BE IMPLEMENTED

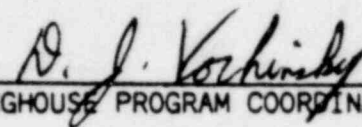
- THE CERTAIN ^(A3) FRONT OF THE SECTION C ANN/CRT CONTROL STATION WILL IDENTIFY THE SPECIFIC ALARM POINT
- NO FURTHER ACTION RECOMMENDED.



ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER



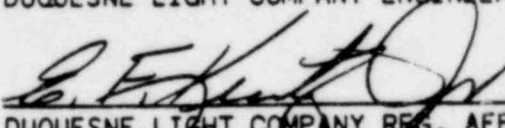
WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

No Action



DUQUESNE LIGHT COMPANY ENGINEERING MANAGER



DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER



DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BURS / 2
PLANT/UNIT

b) ORIGINATOR: J. Goodson c) HED NO.: 2BXX-2117

d) REVIEWED BY: *[Signature]*
(Westinghouse) e) DATE: 10/15/84

[Signature]
(Essex)

f) HED TITLE: Annunciator controls have different arrangements and relative locations at different work stations.

g) ITEMS INVOLVED:
controls 166, 167, 168, 169
controls for A10 and A11

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.3.4.2.a.

Repetitive groups of annunciator controls do not have the same arrangement and relative location at different work stations.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Control room survey, Annunciator system TP 3.1 B3.49
DLGIN 2403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Incorrect response } "blind" reaching not facilitated
Delayed response }

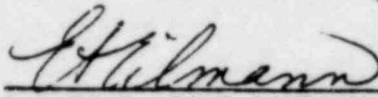
k) REVIEW AND RECOMMENDATIONS:

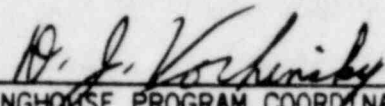
Install new controls which are consistent with arrangements of controls in sections A, B, and C.

NOTE: A CHANGE TO RESOLVE THIS DISCREPANCY WAS PREVIOUSLY APPROVED AND WILL BE IMPLEMENTED

NO FURTHER ACTION REQUIRED

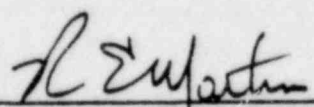

ESSEX HUMAN FACTORS PROJECT MANAGER

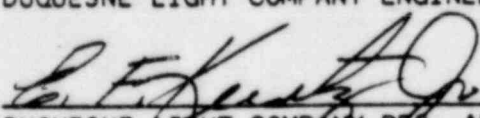

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

No Action


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BUPS/2
PLANT/UNIT

b) ORIGINATOR: J Goodson c) HED NO.: 2B** - 2118

d) REVIEWED BY: W. J. Atull
(Westinghouse) e) DATE: 10/15/84

[Signature]
(Essex)

f) HED TITLE: Annunciator controls not coded differently than
other panel controls.

g) ITEMS INVOLVED:
166, 167, 168, 169

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.3, 4.2.6 (2), (3), (4)

Controls not shaded differently from other panel controls.
Group of controls not demarcated.
Shape of controls not distinctive.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Control room survey, Annunciator system TP 3.1 B3-50

DL CIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Delayed response - difficulty in locating group of
controls.

k) REVIEW AND RECOMMENDATIONS:

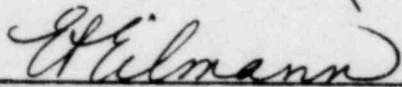
Recommend installing new group of annunciator controls which conforms to guidelines and is consistent with other annunciator controls.

• NEW ANN/CRT CONTROL STATIONS HAVE BEEN INSTALLED

• NO FURTHER ACTION RECOMMENDED



ESSEX HUMAN FACTORS PROJECT MANAGER



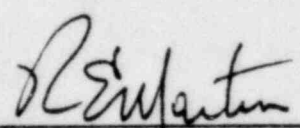
DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER



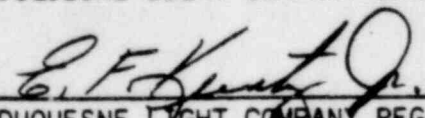
WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

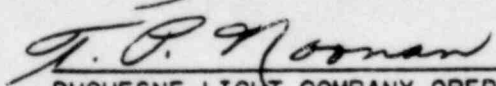
No Action



DUQUESNE LIGHT COMPANY ENGINEERING MANAGER



DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER



DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BUPS/2
PLANT/UNIT

b) ORIGINATOR: -J. Goodson c) HED NO.: 2BXX-2/19

d) REVIEWED BY: *W. J. Catullo Jr.* e) DATE: 10/15/84
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: Annunciator control design allows operator to defeat
control operation.

g) ITEMS INVOLVED:
166, 167, 168, 169

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.3.4.2 c.

Annunciator control pushbuttons can be held down by inserting
a coin in the ring around the pushbutton.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

Control room survey, Annunciator system TP 3.1 B3-52
DLCIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Delayed response

Omitted response

k) REVIEW AND RECOMMENDATIONS:

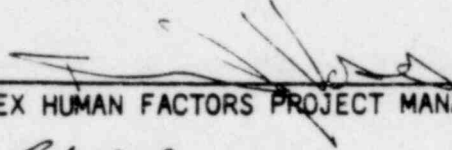
Reglance controls with pushbuttons that can't be defeated.

(If these controls are reglaced to conform with other annunciator controls, as suggested in other HEDs, problem will be solved.)


NOTE: A CHANGE TO RESOLVE THIS DISCREPANCY ^{ON BENCHMARKS} WAS PREVIOUSLY APPROVED AND WILL BE IMPLEMENTED

• ADMINISTRATIVE CONTROLS PREVENT OPERATORS FROM DEFEATING CONTROLS ON VERTICAL BOARD.

• NO FURTHER ACTION REQUIRED

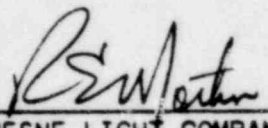

ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

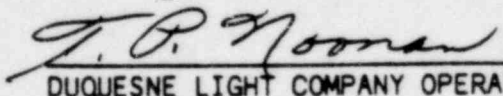

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

No Action


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) BEAVER VALLEY POWER STATION - UNIT 2
PLANT/UNIT

b) ORIGINATOR: M. K. Davidson c) HED NO.: 2V** - 2120

d) REVIEWED BY: R. J. Kochinsky e) DATE: 11/27/84
(Westinghouse)

T. J. Voss
(Essex)
Annunciator

f) HED TITLE: Letter Height Not Legible from Required Viewing Distance

g) ITEMS INVOLVED: Annunciator Tile Lettering

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.3.5.2(1)
(.28")

Letter height "does not subtend a minimum visual angle of 15 minutes,
or $.004 \times$ viewing distance, where the viewing distance exceeds
70".

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

Control Room Survey, Annunciators
TP 3.1 B1.1.1.2 DLCIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Inability to read annunciator tiles from the annunciator response station.

k) REVIEW AND RECOMMENDATIONS:

Increase annunciator letter height. Letter height can be increased somewhat to .312" (5/16") using a maximum of 3 lines per tile and complying with NUREG-0700 recommendations of spacing between lines and at border being equal to 1/2 of letter height = .156" (5/32"). To ensure maximum readability at required distances, however, it is also necessary to carefully control other aspects of engraving such as stroke width of letters, spacing between letters, and spacing between words.

~~ANNUNCIATOR~~

~~ENGRAVING SCHEME IN COMPLIANCE~~

~~WITH 0700 GUIDELINES.~~

NO PROBLEM DURING

VALIDATION, ALSO CRT

IS IN FRONT OF ANNUNCIATOR

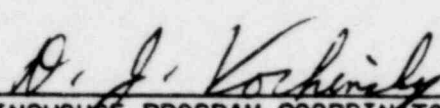
RESPONSE STATION. NO ACTION

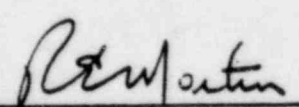
1) REVIEW AND DISPOSITION:

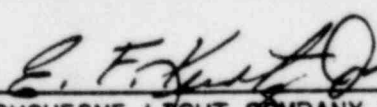
No Action


ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 6-21-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) BVPS-2
PLANT/UNITb) ORIGINATOR: M. Francherc) HED NO.: 2XXX-2121d) REVIEWED BY: D. J. Vukobratovic
(Westinghouse)e) DATE: 3/25/85T. V. Vukobratovic
(Essex)f) HED TITLE: Annunciator Alarms contain permissiveg) ITEMS INVOLVED: Annunciators [ex. (P-6)]
[especially permissives]h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.3.1.1 & 6.3.1.4 b.

Some annunciators contain permissives which do not describe an out of tolerance condition or they do not fit into proper 0700 categories.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Validation of Control Room Function
(R406)

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Operator may respond incorrectly

k) REVIEW AND RECOMMENDATIONS:

Recommend that permissive lights be color coded (light blue?) so that all operators will be able to immediately identify permissives from alarms.

RT. Recommendations: The panel in question^(ANNA12) contains only permissive and status indications. No alarms are included and the panel is sufficiently distinct from all alarm panels that no confusion could occur. A label describing the panel function ~~should~~^{SHOULD} be added, but color coding is not needed. There are no permissives or status lights mixed into alarm panels.

Summary:

- add label describing

Panel A12 function

- color-code permissives (light blue?)

T. J. ...
ESSEX HUMAN FACTORS PROJECT MANAGER

E. T. Edmann / MED
DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

D. J. Vorkin
WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Permissives occur during operation evaluation. Operators are sensitized to permissives occurring at these times. No action is required due to the fact that operators are not req'd to make instantaneous decisions to sustain operation based on a permissive indication.

R. J. Martin
DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

E. F. ... 6-21-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER

T. P. Noonan
DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) BYPS 2
PLANT/UNIT

b) ORIGINATOR: JENNIFER DAYETTE c) HED NO.: 2VC7-2201

d) REVIEWED BY: *[Signature]* e) DATE: 8/10/84
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: Scale values do not progress
BY 12.5 10

g) ITEMS INVOLVED:

SCALE ON PANEL VC-7 (25)
TURBINE VIBRATION & ECCENTRICITY

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

VALUES INDICATED BY UNIT GRADUATIONS DO NOT PROGRESS
BY 1, 2, 5, 10 OR TRUE VALUES MULTIPLIED BY SOME
POWER OF 10.
6.5.1.5a (3) & 6.5.4.1c (MULTIPLE) 0 3 6 9 12 15 0.4 .8 1.2 1.6 2.0
SCALES 0 3 6 9 12 15 0.2 .4 .6 .8 1.0

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

DISPLAYS SURVEY - TP 5.1 B3.25 DLCIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

CAN RESULT IN A DELAY IN READING THE SCALE

k) REVIEW AND RECOMMENDATIONS:

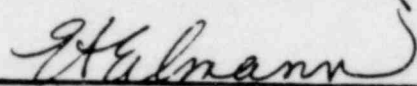
RIGHT THE SCALE SO THE VALUES INDICATED
BY UNIT GRADUATIONS PROGRESS BY 1, 2, 5, 10 OR
THOSE VALUES MULTIPLIED BY SOME POWER OF 10.

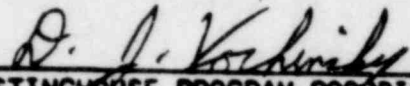
- ~~THE~~ INVESTIGATE POSSIBILITY OF CHANGING LEFT SIDE OF
SCALE (0-15) TO A 0-14 OR 0-16 WITH INCREMENTS OF
TWO. SCALE ON RIGHT SIDE IS OK.

- This recorder is used for trending purposes
- The scale is readable as is
- Not safety-related

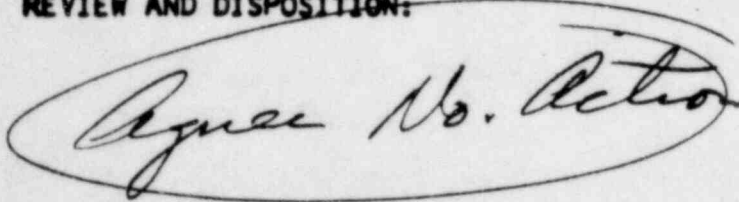
• NO ACTION

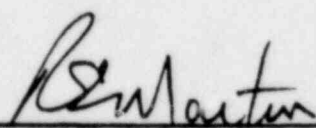

ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:



 8/26/85
DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 7-26-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) 3VPS 2
PLANT/UNIT

b) ORIGINATOR: TENNIS-2 DAYETE

c) MED NO.: 2V** -2202

d) REVIEWED BY:

W. J. Catullo Jr
(Westinghouse)

e) DATE:

Aug 10, 1974

[Signature]
(Essex)

f) MED TITLE:

POINTER TIPS ARE NOT SIMPLE

g) ITEMS INVOLVED: METERS ON PANELS:

V-1 (328)
VA-8 (848)
VS-5 (444A, 444B)
V-6 (450)

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

POINTER TIPS ARE NOT SIMPLE
6.5.2.2a(1)

INDICATOR LOOKS LIKE THIS:



i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

DISPLAYS SURVEY TP 5.1 B3.29

DLCIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:


CAN RESULT IN DELAY OR INCORRECT READINGS
OF METER

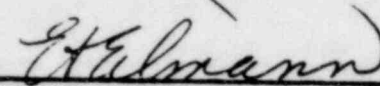
k) REVIEW AND RECOMMENDATIONS:

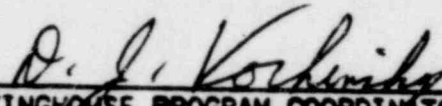
USE A SIMPLER POINTER ON THE METER.

- ITEMS 444A, 444B, AND 450 (NR-46, NR-47, AND NR-45) HAVE POINTERS WHICH OBSCURE SCALE MARKINGS. ~~Will~~ INVESTIGATE A NARROWER POINTER FOR THESE RECORDERS.

- OTHERS LISTED ARE OK.


ESSEX HUMAN FACTORS PROJECT MANAGER

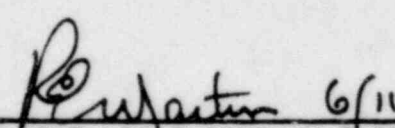

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

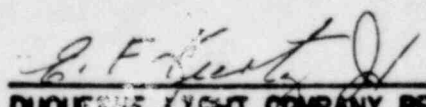

WESTINGHOUSE PROGRAM COORDINATOR

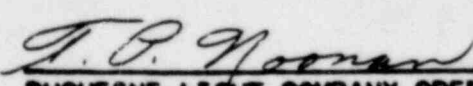
1) REVIEW AND DISPOSITION:

NR 45 used for trend analysis on the strip chart for startups & shutdowns. The arrow head should be large for the operator to quickly glance at the indication & for consistency with NIS, & panel "B" VII indications.
No action.

N46-47 are used for post accident evaluation (normally) & not used in normal plant operation.
No action.


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 5-31-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS 2
PLANT/UNIT

b) ORIGINATOR: MADELINE RYABY c) HED NO.: 2***-2203

d) REVIEWED BY: *M. J. Catullo* e) DATE: 8/23/84
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: MAJOR, INTERMEDIATE AND MINOR GRADUATIONS DO NOT
DIFFER IN LENGTH

g) ITEMS INVOLVED:

SCALES ON PANELS:

VB6 (455, 454, 453, 445, 446, 447, 457, 456)

VBS (441A, 441B, 441C, 441D, 442A, 442B, 444A, 444B)

BB1 (310, 311, 307)

BB2 (315, 316, 317)

BE2 (1, 17)

PC1 (24)

(CONTINUED ON ATTACHED SHEET)

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

MAJOR, INTERMEDIATE AND MINOR GRADUATION MARKS DO NOT
DIFFER IN LENGTH

6.5.1.5.8 (3)

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

DISPLAY SURVEY, TP5.1B3.24 DLCIN R403

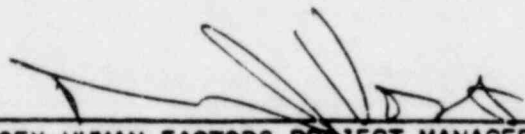
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

CAN CAUSE DELAY IN READING SCALE

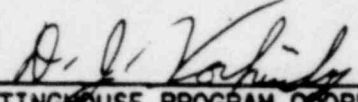
k) REVIEW AND RECOMMENDATIONS:

MAJOR, INTERMEDIATE AND MINOR GRADUATIONS ON SCALE SHOULD BE DIFFERENTIATED BY LENGTH OF MARKS

Markings do not differ in length, but do differ in boldness (thickness). And are readable with no problem. No Action recommended,


ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

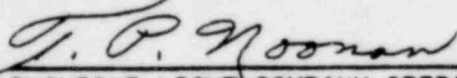

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

No action


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 6-21-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

g.) (continued)

ECE (3A, 4A, 6A, 6B, 7A, 8A, 10, 11, 12A, 13A, 2.1)

EC4 (9A, 9C, 9E, 9G, 8B, 7B, 9B, 9D, 9F, 9H, 13B, 12B, 2.2)

VA7 (817, 818, 824, 828)

VAB (837A, 837B, 910, 848, 1008, 1009, 851, 852, 853, 855, 835, 834B, 1010A,
1010B, 1016)

VA9 (861A, 861B, 861C, 865, 867A, 868, 869, 867B, 863A, 867C, 864A, 864B)

VCL (25B, 252, 260A, 260B, 2A, 236, 2B)

VCLB (238A, 238, 238C, 3B, 4B, 232A, 239, 237A, 237B, 5B, 925B, 240, 241,
242, 243, 244, 231A)VCL9 (232B, 232C, 232D, 232E, 232F, 229A, 230A, 233B, 233C, 925B, 229C,
230C, 234A, 234B, 231B, 229B, 230B, 229D, 230D, 229E, 230E, 229F, 230F)

VA5 (796A, 796B, 1015, 1012, 1013, 1014, 995)

VAG (802E, 813, 873A, 873B, 974A, 974B, 902, 904, 879B, 879C, 978)

VCS (987A, 305A, 988, 987B, 289, 305B, 293)

VCL6 (303, 304, 313, 914, 274A, 274B, 919, 277)

SHUTDOWN PANEL (2AE VOLTS, 2DF VOLTS)

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS 2
PLANT/UNIT

b) ORIGINATOR: MADELINE RYARY c) HED NO.: 2***-2204

d) REVIEWED BY: W. J. Catullo Jr.
(Westinghouse) e) DATE: 8/22/84

[Signature]
(Essex)

f) HED TITLE: INCOMPLETE INFORMATION ON SCALE FACE

g) ITEMS INVOLVED:
VERTICAL SCALES ON PANELS

BB-1 (314)

VA-6 (813)

BB-3 (2NMS-31D & 2NMS-32D)

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:
INCOMPLETE INFORMATION ON SCALE FACE. NEGATIVE
AND POSITIVE VALUES NOT CLEARLY DEFINED.

6.5.1.4.2(1)

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

DISPLAYS SURVEY - TP 5.1 B3.17 DLCIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

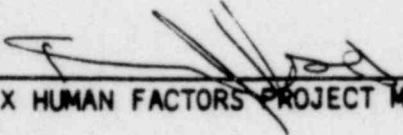
CAN RESULT IN ERROR IN READING OF SCALE

k) REVIEW AND RECOMMENDATIONS:

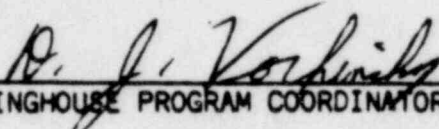
NEGATIVE VALUES SHOULD BE INDICATED PRECEDING EACH NEGATIVE NUMERICAL VALUE ON SCALE.

• ITEMS 314 AND 813 ARE OK.

• 2NMS - 310 & 320 (Startup rate indicators) SHOULD HAVE A NEGATIVE SIGN ON METER FACE.


ESSEX HUMAN FACTORS PROJECT MANAGER

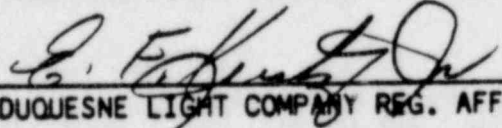

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

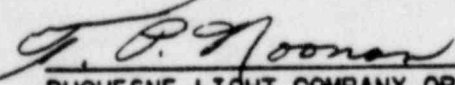

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

The negative value is an extra level of indication of shut down which is not the primarily ~~and~~ ~~but~~ ~~of~~ indication the operator used. No action


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS 2
PLANT/UNIT

b) ORIGINATOR: JENNIFER PAYETTE c) HED NO.: 2VC8-2205

d) REVIEWED BY: W. J. Catullo Jr e) DATE: 8/10/84
(Westinghouse)

CR No. 71

[Signature]
(Essex)

f) HED TITLE: POOR CONTRAST ON ROUND METER SCALES

g) ITEMS INVOLVED:

ROUND METER DISPLAYS ON PANEL VC-8 (1101, 1102, 1103, 1104)

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

POOR CONTRAST - BLACK LETTERING ON DARK BACKGROUND.
6.5-1.3c (1)4(2)

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

DISPLAYS SURVEY TP5.1 B3.1 DLGIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

CAN RESULT IN DELAY IN READING THE DISPLAY.

k) REVIEW AND RECOMMENDATIONS:

- CHANGE ²⁻²⁻⁸⁵ FACE TO BLACK LETTERING ON WHITE BACKGROUND

OK

The photograph of these instruments (on the mock-up) makes them look worse than they actually are. When reviewed in the actual control room these indicators were found to be no problem. NO ACTION

[Signature]
ESSEX HUMAN FACTORS PROJECT MANAGER

[Signature]
DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

[Signature]
WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Recommended that we be consistent with BW-1 due to the fact that the meter is ^{not} safety related nor used in safety related emergency activities.

Recommended no
Change Per

[Signature] 6/11
DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

[Signature] 5-31-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER

[Signature]
DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

~~Refer to HED# 2000-2002~~

a) BVPS 2
PLANT/UNIT

b) ORIGINATOR: TENNIEP. DAITE c) MED NO.: 2B** - 2206

d) REVIEWED BY: W. J. Catullo Jr. e) DATE: 8/10/84
(Westinghouse)

[Signature]
(Essex)

f) MED TITLE: EXCESS INFORMATION PRINTED ON DISPLAY
FACE

g) ITEMS INVOLVED:
METERS AND RECORDERS ON PANEL CB-1 (30A, 310, 311, 312, 92A, 314, 30T,
CB-2 (313, 315, 316, 317), BB-3 (378A, 378B), BC-1 (30, 29, 27, 24, 26),
BC-2 (1, 17), BC-3 (15, 3A, 4A, 5A, 6A, 6B, 10, 11, 17A, 162, 164, 7A, 8A, 12A,
13A, 9A, 9B, 9C, 9D, 9E, 9F, 9G, 9H, 8B, 7B, 13E, 12E, 17E)

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:
EXCESS INFORMATION (MANUFACTURERS' MARK) PRINTED ON
DISPLAY
6.5.1.4b & 6.5.4.1c

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

DISPLAY SURVEY TFS.1 B3.18 DLKIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

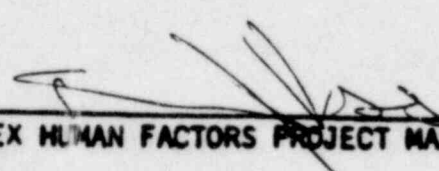
CAN RESULT IN A DELAY IN READING THE DISPLAY

k) REVIEW AND RECOMMENDATIONS:

REVIEW THE FIELD INFORMATION (MANUFACTURER'S
- PROBLEM) FROM THE DISPLAY FACE

• Excess information on scales does not block needed information.

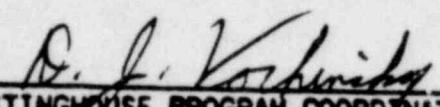
This will be checked during Validation walk-throughs. Those found
to be a problem will be written as HEDs. No further action
~~at this time~~ ON THIS HED.



ESSEX HUMAN FACTORS PROJECT MANAGER



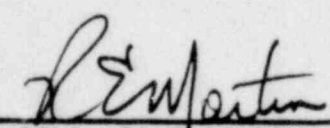
DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER



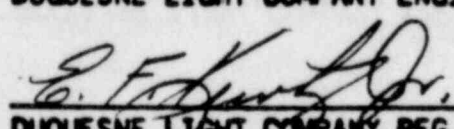
WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

No Action



DUQUESNE LIGHT COMPANY ENGINEERING MANAGER



DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER



DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS 2
PLANT/UNIT

b) ORIGINATOR: TENNISER PALETTE

c) HED NO.: 2803-2207

d) REVIEWED BY: W. J. Catullo Jr
(Westinghouse)

e) DATE: 8/10/84

[Signature]
(Essex)

f) HED TITLE: NUMERALS ON FIXED SCALE NOT VERTICAL

g) ITEMS INVOLVED:

FIXED SCALES ON PANEL 3C-3 (162, 164)

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

NUMERALS ON FIXED SCALES ARE NOT VERTICAL -
6.5.2.4a

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

DISPLAYS SURVEY T.P.5.1 B3.20 DLCIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

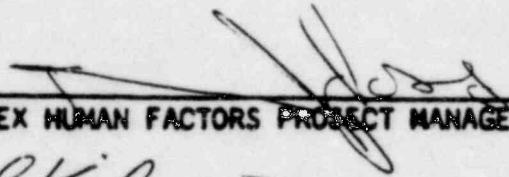
CAN RESULT IN A DELAY IN READING THE
DISPLAY

A) REVIEW AND RECOMMENDATIONS:

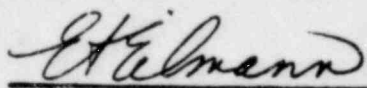
CHANGE THE SCALE SO THE NUMERALS ARE VERTICAL.

• NOT A PROBLEM. NUMERALS ARE READABLE.

• NO ACTION RECOMMENDED



ESSEX HUMAN FACTORS PROJECT MANAGER



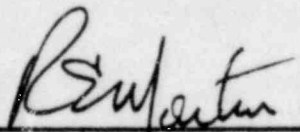
DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER



WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

No Action



DUQUESNE LIGHT COMPANY ENGINEERING MANAGER



DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER



DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS 2
PLANT/UNIT

b) ORIGINATOR: SEN. ER. FAYEE c) HED NO.: 2XXX-208

d) REVIEWED BY: W. J. Catullo Jr. e) DATE: 8/10/84
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: MORE THAN NINE GRADUATIONS SEPARATE
NUMBERS ON SCALES

g) ITEMS INVOLVED: SCALES ON PANELS:

BC-3 (6A, 6B, 171A, 171B, 162, 164, 15)

BC-1 (29, 24)

BC-2 (17)

BC-2 (81B)

BC-1 (21)

cont. on attached sheet

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

MORE THAN NINE GRADUATIONS SEPARATE NUMBERS
ON SCALES.

6.E.1.5a (1) & 6.E.4.1c

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:


DISPLAYS SURVEY - TP 5.1 B3.22 DLCIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

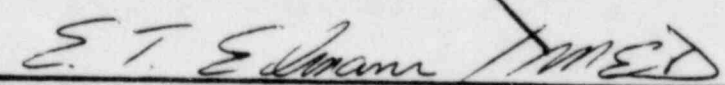
CAN RESULT IN A DELAY OR INCORRECT READING
OF A DISPLAY

k) REVIEW AND RECOMMENDATIONS:

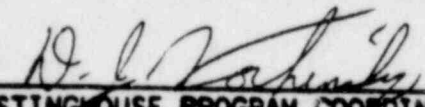
CHOOSE THE SCALE SO NO MORE THAN NINE
GRADUATIONS SEPARATE NUMERALS ON A SCALE
Scale are easily read, no action required.



ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER




WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

No Action.



DUQUESNE LIGHT COMPANY ENGINEERING MANAGER



DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER



DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

(CONTINUED TP 5.1 33.22)

1. KAL AUX-BO-12 (G-12-T121A, 2HYS-F122A, 2HYS-FE22, 2HVD-T121E,
2HYS-F122E, 2CDS-T135B)

BC-7 (229A, 229B, 229C, 229D, 229E, 229F)

BC-8 (240)

BC-7 (252)

BC-6 (273E, 93, 917, 273A, 94, 302, 1017B, 91, 92, 266, 1141, 23)

BC-5 (1017A, 297, 292E, 296, 290A, 987A, 305A, 988, 957B, 289, 305B,
293, 1018A)

VB-5 (441A, 441E, 441C, 441D, 442A, 442B)

VB-6 (449, 448, 458, 457, 455, 454, 453, 445, 446, 447)

VB-7 (867A, 866, 865, 860C, 861E, 861A, 862A, 862B, 862C,
869, 867B, 871, 870, 867C, 864A, 864B)

VA-5 (795B, 795A, 796A, 796E, 94, 80-f)

VA-8 (949B, 949A, 848, 831B, 831A, 841C, 71, 1007, 853,
822B, 835, 837, 1016, 1012, 1014,

871, 829A, 822A, 824, 822B, 832A)

VA-6 (822, 874, 875, 874E, 874A, 298, 810, 902, 904,
974A, 974B, 373A, 812E, 804B, 31)

a) -VPS 2
PLANT/UNIT

b) ORIGINATOR: _____

c) HED NO.: 2***-209

d) REVIEWED BY: _____

e) DATE: 8/10/84

(Westinghouse)

(Essex)

f) HED TITLE: POINTER TIPS CONCEAL SCALE GRADUATION

MARKS OR NUMERALS

g) ITEMS INVOLVED:

ALL ROUND METERS

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

POINTER TIPS CONCEAL GRADUATION MARKS OR NUMERALS

6.5.22a(2)

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

DISPLAYS SURVEY TP 5.1 B3.30 DLCIN R403

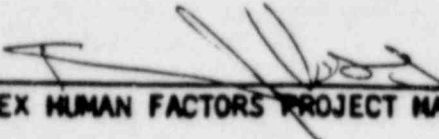
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

CAN RESULT IN DELAY OR INCORRECT READING
OF THE SCALE

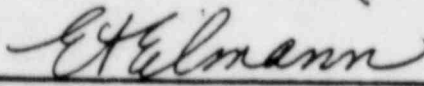
k) REVIEW AND RECOMMENDATIONS:

Change pointers to a type that will minimize concealment of marks and numerals,

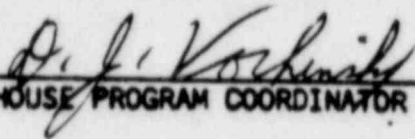
- NUMBERS OTHER THAN ZERO ARE ONLY PARTIALLY CONCEALED
ZERO CAN BE IDENTIFIED BY POINTER POSITION
- NO ACTION RECOMMENDED



ESSEX HUMAN FACTORS PROJECT MANAGER



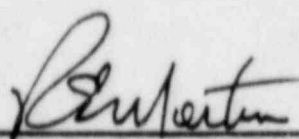
DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER



WESTINGHOUSE PROGRAM COORDINATOR

l) REVIEW AND DISPOSITION:

No Action



DUQUESNE LIGHT COMPANY ENGINEERING MANAGER



DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER



DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) BVPS 2
PLANT/UNIT

b) ORIGINATOR: TENNIS PAVETI c) HED NO.: 2XXX-2210

d) REVIEWED BY: M. J. Catullo e) DATE: 8/10/84
(Westinghouse)

T. J. [Signature]
(Essex)

f) HED TITLE: POINTER SIZE NOT ADJUSTABLE RAPID

RECOGNITION OF POINTER POSITION

- g) ITEMS INVOLVED: SCALES ON PANELS:
VA-8 (910, 848, 1008, 1009, 851, 852, 853)
VA-9 (861A, 861B, 861C, 866, 867A, 1068, 868, 869, 867B, 867C)
VB-6 (455, 454, 457, 456, 445, 446, 447)
VC-6 (914, 274A, 274B, 919)
VC-7 (260A, 260B)

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

POINTER IS TOO NARROW FOR RAPID RECOGNITION OF
POINTER POSITION

6.5.2.2c

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

DISPLAY SURVIVABILITY - TP 5.1 B3.32 DLGIN R403


j) SPECIFIC HUMAN ERRORS(a) OR EQUIPMENT DESIGN PROBLEM:

CAN RESULT IN A DELAY OR INCORRECT REACTION OF
SCALE

k) REVIEW AND RECOMMENDATIONS:

CHANGE FONT TO A BROADER STYLE OR
FOR BETTER CONTRAST, CHANGE COLOR OF
POINTERS TO RED.

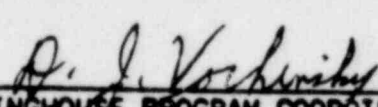
- POINTERS ARE ALREADY RED, IF THEY WERE WIDER
THEY WOULD CONCEAL THE SCALE GRADUATION MARKINGS
AND NUMBERS.
- NO ACTION RECOMMENDED



ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER



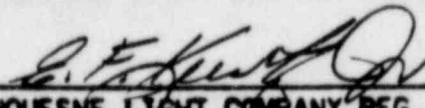
WESTINGHOUSE PROGRAM COORDINATOR

l) REVIEW AND DISPOSITION:

No Action



DUQUESNE LIGHT COMPANY ENGINEERING MANAGER



DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER



DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HED^A ~~2XXX~~-2210

BB-1 (1310, 31, 34)

BB-2 (513, 315, 317, 319)

BB-3 (378A, 378B)

VA-5 (802A, 802B)

VA-6 (802C, 802D, 802E, 802F, 805A, 805B, 872, 973, 974A, 974B)

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2VXX-2211

d) REVIEWED BY: D. J. Vachinsky
(Westinghouse) e) DATE: 3/25/85

T. [Signature]
(Essex)

f) HED TITLE: No indicator for ~~Steamline~~ ΔP

g) ITEMS INVOLVED: SG Press [2MSS x PI 474, 484, 494]
475, 485, 495
476, 486, 496]

RCS WR Pressure [2RCS x PI 402, 403]

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.5.1.2 (b)

Currently operators have to compare a ^{MSS} ~~RCS~~ PI's with
2 RCS WR PI's to come up with ~~RCS~~ ΔP . The introduction of
a ^{MF} ~~as~~ Steamline ΔP indicator would eliminate operator ^{mental} conversion

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Validation of Control Room Functions
(R406)

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

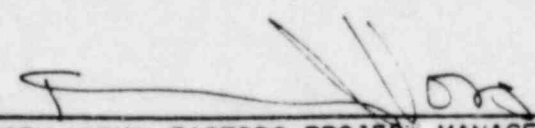
Operator's response may be incorrect or
delayed.

k) REVIEW AND RECOMMENDATIONS: Install either:

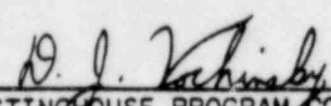
1) a differential (ΔP) Pressure indicator
or

2) 2 Pressure recorders (RCS and SG) next to each other so operator can look at just one panel (and meter) to gain information.

RT suggests that, as an operator aid, this ΔP be ^{made} available on computer display

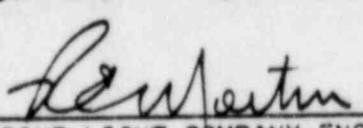

ESSEX HUMAN FACTORS PROJECT MANAGER

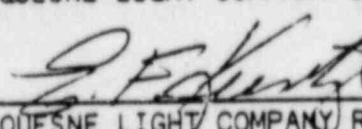

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Rejected
Only need to monitor SP for tube integrity, specifically for complete blowdown of secondary side (which is a Condition ~~Its~~ ^{*}Event). Sufficient information available to operator presently to determine if or when this condition exists. No change required.

 10-1-85
DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 7-15-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

* Not likely to occur during 40 y.e. operation

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

7

a) BVPS-2
PLANT/UNITb) ORIGINATOR: M. Francher c) HED NO.: 2VXX-2212d) REVIEWED BY: A. J. Lockensby
(Westinghouse) e) DATE: 1/29/55[Signature]
(Essex)f) HED TITLE: Scale Compatibility between
associated instruments.

g) ITEMS INVOLVED:

- 1) 2RCS-PR444 with 2RCS-PI 444, 454 Pressurizer Pressure
- 2) 2RCS ^{TR}408 with 2RCS-TI 411A, 421A, 431A RCS Tavg Normal Range
- 3) 2RSS-LR 151 with 2RSS-LI 151A, 151B (see attachment)

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.5.1.4a Printing on the display face. When two or more displays of the same parameter must be compared, scales should be compatible in numerical progression and scale organization

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER: Verification of task Performance Capability Suitability (R-405) 6.2.1.2


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

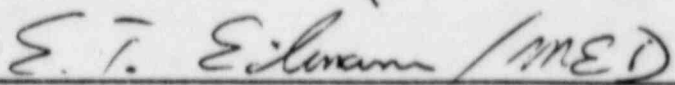
Can result in a delay or incorrect reading of the display

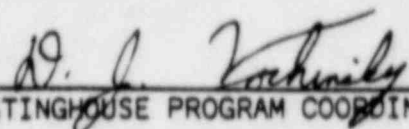
k) REVIEW AND RECOMMENDATIONS:

Scales on displays should be changed so they are compatible. (See attachment)
This is not a problem. Scales on indicators are compatible w/ each other, it is not necessary for the indicator scales to be identical to the Recorder scales.

NO ACTION


ESSEX HUMAN FACTORS PROJECT MANAGER

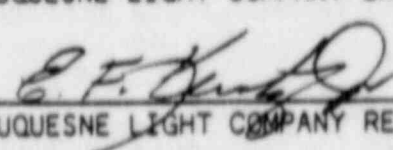

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

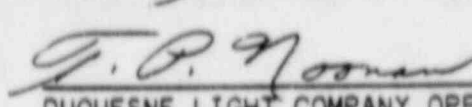

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

No action


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 6-21-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

Scale Compatibility

HED No. 2111-2212

existing scales are:

2RCS-PR444 = 1700 1900 2100 2300 2500

to be used with

2RCS-PI 444, 454 = 1800 2000 2200 2400

2RCS-TR408 = 530 550 570 590 610 - 630

to be used with

2RCS-TI 411A, 421A, 431A = 540 560 580 600 620 640

2RSS-LR151 0 20 40 60 80 100 120

to be used with

2RSS-LI 151A, 151B 0 30 60 90 120

a) BVPS-2
PLANT/UNIT

9

b) ORIGINATOR: M. Francher c) HED NO.: 2VAA-2216d) REVIEWED BY: D. L. Vorhies e) DATE: 1/29/85
(Westinghouse)[Signature]
(Essex)f) HED TITLE: Absolute and ^{gage} gravitational scales are
used to encompass a larger areag) ITEMS INVOLVED: Containment ~~Sump~~ Press. (Normal) 0-15 psia
Containment ~~Sump~~ Press (Abnormal) 0-60 psiah) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: (6.5.12 b.)

Displays should indicate values in a form immediately
usable by the operator without requiring mental conversion.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER: (R405) Verification of task performance
capabilities, suitability


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

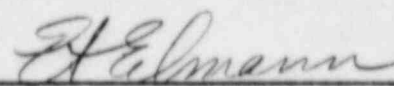
Operator's response may be delayed.

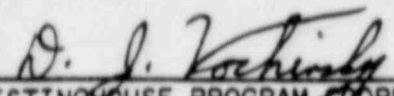
k) REVIEW AND RECOMMENDATIONS:

One scale is used to convey normal pressure (0-15 psig)
A second is used to convey abnormal pressure (0-60 psig)
Scales are in different units (psia vs. psig) which necessitates conversion. Investigate possibility of expressing pressures in the same parameters (units) or combining scales. Recommend converting psia to psig with negative scale values indicated. Most pressure parameters are expressed in psig in the control room.

SEE # 2V45-2009


ESSEX HUMAN FACTORS PROJECT MANAGER

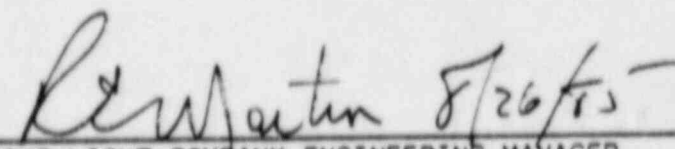

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

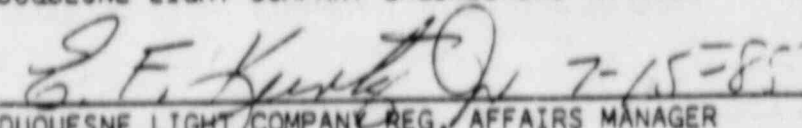

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

PSIA IS FOR VACUUM INDICATION
(NOTE BU-2 HAS A SUBATMOSPHERIC CONTAINER)
PSIG IS FOR PRESSURE INDICATION.

No Change


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2XXX-2219

d) REVIEWED BY: D. L. Vokinsky e) DATE: 3/25/85
(Westinghouse)

I. J. Vokinsky
(Essex)

f) HED TITLE: No RPM meter available in Control
room for Turbine driven Aux Feedwater
pumps HF

g) ITEMS INVOLVED: Turbine driven pumps
2 FWE-P22

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.3.1.1 b.

There is no RPM meter provided in the control room so
an operator cannot tell if pumps are running

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

Validation of Control Room Functions
(R406)

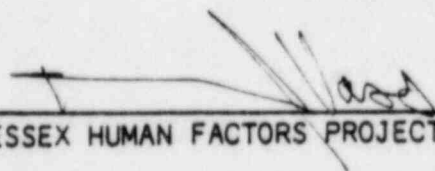
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

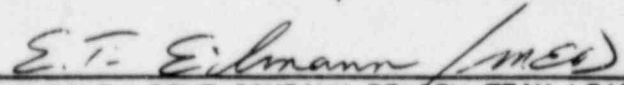
Operator may respond incorrectly

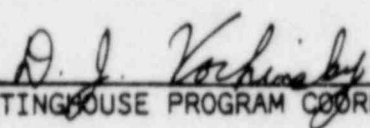
k) REVIEW AND RECOMMENDATIONS:

It is recommended that an RPM meter be installed in the control room so that an operator can tell if the pumps are running.

RT recommends that the procedure be changed such that the operator is to verify that the steam supply valves are open, if there is no aux Feedwater flow then the Turbine driven Aux Feedwater pumps are to be checked locally, no RPM meter is required.

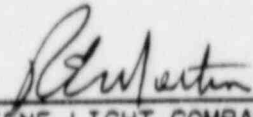

ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

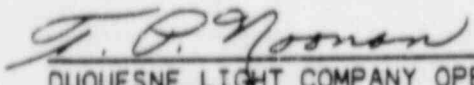

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Agree no RPM meter is needed.


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BUP-2
PLANT/UNIT

b) ORIGINATOR: N. KEOUR

c) HED NO.: 288K-2301

d) REVIEWED BY: *A. J. Catullo*
(Westinghouse)

e) DATE: 11/7/84

T. J. [Signature]
(Essex)

f) HED TITLE: LOSS OF BORIC ACID FLOW TO BLENDER AND BIT RECIRC FLOW
RESULTING FROM MECHANICAL FAILURE ON A/B PUMP SUCTION CROSSCONNECT

g) ITEMS INVOLVED:

A/B PUMP SUCTION CROSS CONNECT CONTROL

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

LOSS OF BORIC ACID FLOW TO BLENDER AND LOSS OF BIT RECIRC FLOW
RESULTED FROM A MECHANISM FAILURE ON A/B PUMP CROSS CONNECT CONTROL
VALVE INDICATED OPEN BUT WAS 2 TURNS AWAY FROM THE CLOSED POSITION.
BORIC ACID PUMP WAS LEFT RUNNING WITH INADEQUATE SUCTION.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

LER 280-84020

LER Review DLCIN 8401A

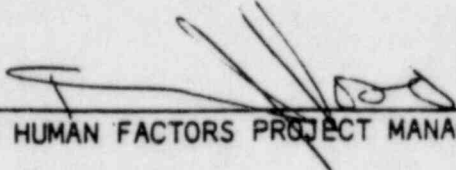
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

VALVE INDICATED OPEN BUT WAS TWO TURNS AWAY FROM THE CLOSED POSITION
EQUIPMENT FAILURE RESULTING IN LOSS OF BORIC ACID FLOW

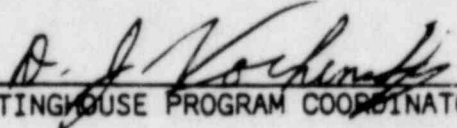
k) REVIEW AND RECOMMENDATIONS:

THESE INDICATION SHOULD BE CHANGED TO REFLECT THE FOLLOWING

- BV-2 IS DESIGNED SUCH THAT BOTH RED & GREEN INDICATING LIGHTS WILL BE LIT WHEN VALVE IS IN AN INTERMEDIATE POSITION
- NO ACTION RECOMMENDED.

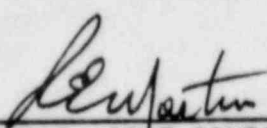

ESSEX HUMAN FACTORS PROJECT MANAGER

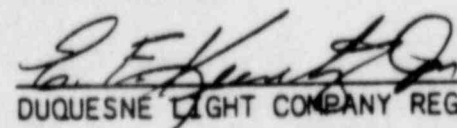

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

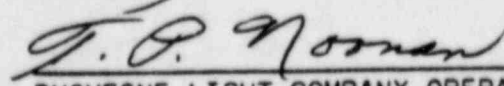

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

No Action


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) PLS 2
PLANT/UNIT

b) ORIGINATOR: JOHN R. PAYETTE c) HED NO.: 2***-2303

d) REVIEWED BY: W. J. Catullo e) DATE: 8/10/84
(Westinghouse)

T. J. Voss
(Essex)

f) HED TITLE: LETTERING ON LEGEND LIGHTS IS TOO SMALL

g) ITEMS INVOLVED:

LEGEND LIGHTS PANEL BA-2 (464), BA-3 (1069, 1070), BA-4 (465),
VC-6 (1020), VC-5 (1019), BB-1 (308), BC-2 (18, 19, 46, 47), VERTICAL
AUXILIARY BOARD BOTTOM LEFT LIGHT PANEL

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

LETTERING HEIGHT TOO SMALL ON LEGEND LIGHTS - 8 L.C's.
Should be .177", and .125" - 6.5.1.3a

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

DISPLAYS - SURVEY TP 5.1 B 1.1 DLCIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

CAN RESULT IN A DELAY IN READING THE DISPLAY

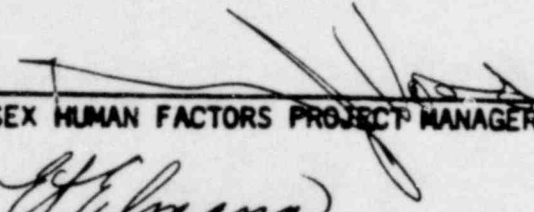
R/ REVIEW AND RECOMMENDATIONS:

INCREASE THE SIZE OF THE LETTERING ON THE
SEEDING LIGHTS

• ~~also~~ ATTEMPT (IN NEW ENGRAVING OF LIGHTS) TO INCREASE
LETTER SIZE, KEEPING WITHIN LIMITS OF MESSAGE CONTENT
AND KEEPING MESSAGES TO THREE LINES.

- Not necessary, when the tiles are lit they are quite
legible. Although the operator would have to go to
back of bench board to read vertical board lights, this
is not a problem.

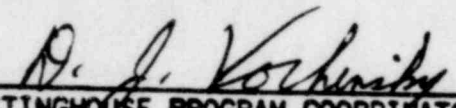
NO ACTION



ESSEX HUMAN FACTORS PROJECT MANAGER



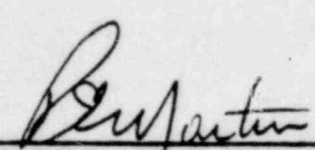
DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER



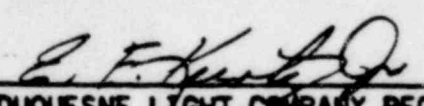
WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

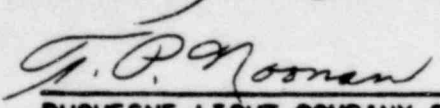
No Action



DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 6-21-85

DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER



DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) BVPS 2
PLANT/UNIT

b) ORIGINATOR: JENNIFER DANETTE c) HED NO.: 2BXX-2304

d) REVIEWED BY: N. J. Catullo Jr. e) DATE: 8/10/84
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: (CONTRAST ON LEGEND) LIGHTS IS POOR

g) ITEMS INVOLVED:

LEGEND LIGHTS ON PANEL BA-2 (46A), BA-4 (46B), BB-1 (308)

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

POOR CONTRAST UNDER AMBIANT LIGHTING - WHITE LETTERING
ON BLACK BACKGROUND
6.5.3.3a(3)

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

DISPLAY SUBVT1 TP 5.1 B3.8 DLGIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

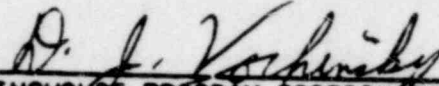
CAN RESULT IN A DELAY IN READING THE DISPLAY

k) REVIEW AND RECOMMENDATIONS:

CHANGE ~~RED~~ - ~~RED~~ - ~~RED~~ TO BLACK LETTERS, WITH
WHITE BACKGROUND.
TO BE
CORRECTED AS PART OF COLOR CODING EFFORTS ON
STATUS - LIGHTS.


ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

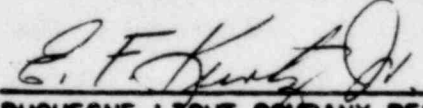
1) REVIEW AND DISPOSITION:

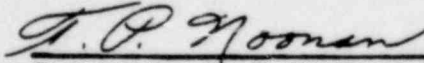
Para 6.6.20 0700 states white on
Black is acceptable. Status lights are
rarely used & only read when lit.
No change necessary. This is also
consistent w/ BV-1

7/24/85

RT agrees/understand's color
coding of these status/legend
gr's. Recommend that DLC
ensures that lights are
receptible when activated.


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 5-31-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) BVPS 2
PLANT/UNIT

b) ORIGINATOR: TENNIFER PAYETTE c) MED NO.: 2***-2305

d) REVIEWED BY: *W. J. Catullo Jr.* e) DATE: 8/10/84
(Westinghouse)

T. J. [Signature]
(Essex)

f) MED TITLE: MORE THAN THREE LINES OF LETTERING
APPEAR ON LEGEND LIGHTS

g) ITEMS INVOLVED:
LEGEND BUTTONS ON PANEL BA-2(464), BA-3(1069,1070),
VC-6 (1020), VC-5(1019)

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:
MESSAGES ON LEGEND LIGHTS CONTAIN MORE THAN
THREE LINES OF LETTERING.
6.5.33b(5)

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

DISPLAY SURVEY TP 51B3.12 DLCIN R403


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

CAN RESULT IN A DELAY IN READING THE DISPLAY

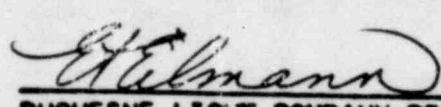
k) REVIEW AND RECOMMENDATIONS:

REDUCE THE NUMBER OF LINES ^{TO THREE} ON THE LEGEND
PAGE 31 USING ABBREVIATIONS.

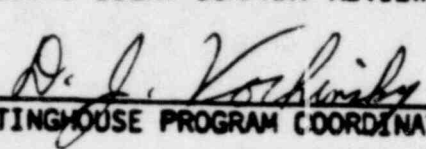
OK



ESSEX HUMAN FACTORS PROJECT MANAGER

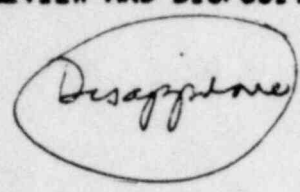


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

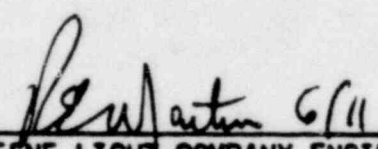


WESTINGHOUSE PROGRAM COORDINATOR

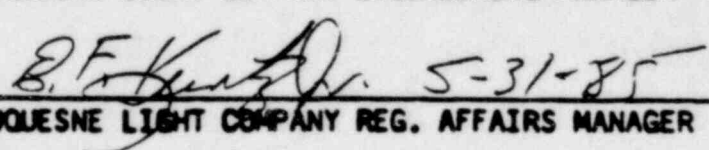
1) REVIEW AND DISPOSITION:

 See #2302

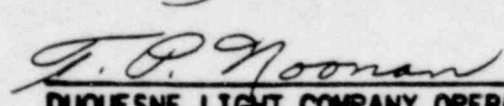
FT refer to #2002



DUQUESNE LIGHT COMPANY ENGINEERING MANAGER



DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER



DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS 12
PLANT/UNIT

b) ORIGINATOR: N ICFOURY

c) HED NO.: 2***-2306

d) REVIEWED BY: *W. J. Catullo*
(Westinghouse)

e) DATE: 7/31/84

[Signature]
(Essex)

f) HED TITLE: INCONSISTENT USE OF COLOR COODING ON CIRCUIT BREAKER

INDICATION

g) ITEMS INVOLVED: POSITION INDICATORS ON DUAL-HANDLE C-SERIES ACTUALLY CONTROLS

Samples are:

PNL BC 2

149 Station Air Compressor 2SASC21A

150 Station Air Compressor 2SASC21B

161 Main Field Ground Test

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

white lights instead of green lights used for
circuit breaker indication - 6.5.1.6c(2), d(1) & (3); 6.5.3.2a(2)
& 6.4.2.2f(1)

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

CONVENTIONS SURVEY TP8.107.5, 7, 9

DLCIN R403

j) SPECIFIC HUMAN ERROR(S) OR EQUIPMENT DESIGN PROBLEM:

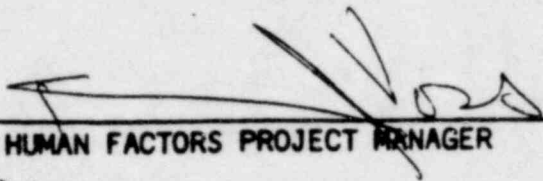
MAY CAUSE DELAYS AND/OR ERRORS IN OPERATOR RESPONSES.

k) REVIEW AND RECOMMENDATIONS:

REPLACE WHITE INDICATOR LIGHTS ON DISCRETE ROTARY CONTROLS WITH GREEN LIGHTS TO MAKE COLOR CODING CONSISTENT

- DLC CONVENTION IS WHITE AND RED FOR HIGH VOLTAGE CIRCUIT BREAKERS AND GREEN AND RED FOR LOW VOLTAGE, OPERATORS UNDERSTAND AND ARE WELL TRAINED ON THIS CONVENTION.

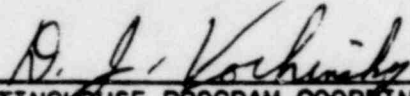
- No ACTION RECOMMENDED



ESSEX HUMAN FACTORS PROJECT MANAGER



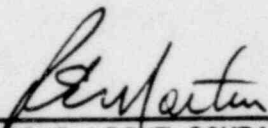
DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER



WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

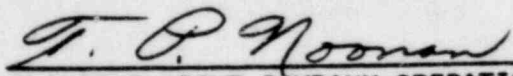
No Action



DUQUESNE LIGHT COMPANY ENGINEERING MANAGER



DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER



DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) EVPS-2
PLANT/UNIT

6

b) ORIGINATOR: M. Francher c) HED NO.: 2BA4-2307

d) REVIEWED BY: D. J. Kochinsky
(Westinghouse) e) DATE: 1/28/85

[Signature]
(Essex)

f) HED TITLE: Indicator lights are not located close to associated control

g) ITEMS INVOLVED:

2CHS * FCV 114A - Dilution Ratio Isolation valves
(army grade water to blender)
2CHS * FCV 113A - Boric Acid Injection to Blender 21

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

6.9.2.2 a(1) The preferred configuration of a display located directly above each control is not used here. Indicator lights are located 7 inches to the left of the ^{associated} controller.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Verification of Task performance capabilities,
Suitability (R405) 6.2.1.2

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:


Operators response may be delayed

k) REVIEW AND RECOMMENDATIONS:

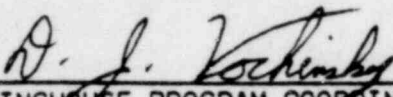
Place the + in the control panel
above the control panel.

- Lights are within the Blender control area.
various conditions will determine valve position,
not & solely dependent on controllers.

NO ACTION


ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

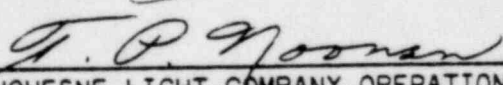

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Agree No action


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2BB22309

d) REVIEWED BY: D. J. Vorkin
(Westinghouse) e) DATE: 3/18/85

T. Vost
(Essex)

f) HED TITLE: Position indication^{lights} missing for Rx
and RX TRIP
trip bypass breakers

g) ITEMS INVOLVED: Rx trip
bypass breakers + RX Trip breakers

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.5.3.1
Operator has no light to indicate the position
of the bypass breakers and trip breakers.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:
Validation of Control Room functions
(R406)

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Operator may respond incorrectly

k) REVIEW AND RECOMMENDATIONS:

Install indication lights above

~~2nd~~ ~~Rx~~ bypass breakers.

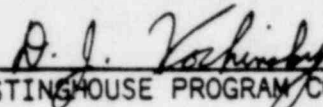
RT recommends no action, all four of the breaker positions are currently available on the computer.

Also, annunciators 6G & 7G on A4 light when breaker is closed.

NO ACTION


ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

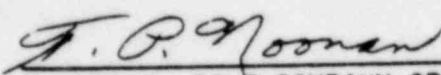

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

No Action


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 6-21-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) 2VPS 2
PLANT/UNIT

b) ORIGINATOR: JENNIFER PAYETTE c) HED NO.: 2VC7-2401

d) REVIEWED BY: V. J. Catullo Jr. e) DATE: 8/10/84
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: POOR CONTRAST ON CHART RECORDER
SCALE

g) ITEMS INVOLVED:

RECORDER ON PANEL VC-7 (252)
(TURBINE CONTROLLED START TEMP)

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

POOR CONTRAST - WHITE MARKINGS ON BLACK BACKGROUND
6.5.1.BC (1) & (2)

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

DISPLANS SURVEY TP 5.1 B3.1 DLGIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

CAN RESULT IN A DELAY IN READING THE DISPLAY


k) REVIEW AND RECOMMENDATIONS:

- CHANGE DISPLAY FACE TO BLACK LETTERS ON WHITE BACKGROUND

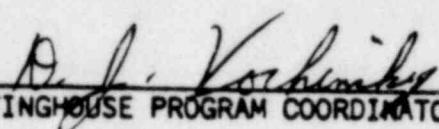
(A) ~~B~~ Contrast is good, instrument is non-safety related. MED.

(see section l for decision)

7/29/65 RT-agrees contrast is adequate recommendation was based on consistency


ESSEX HUMAN FACTORS PROJECT MANAGER

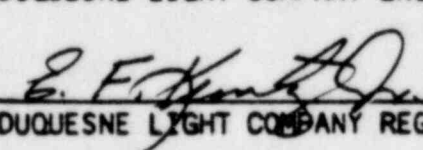

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

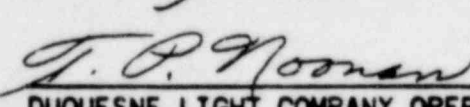

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

No change needed; see (A)


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS-2

PLANT/UNIT

b) ORIGINATOR: MADELINE RYABY

c) HED NO.: 2EB2-2501

d) REVIEWED BY:

W. J. Catullo Jr.
(Westinghouse)

e) DATE: OCT 11, 1984

[Signature]
(Essex)

f) HED TITLE: Counter drums do not increase with upward
movement

g) ITEMS INVOLVED:

Shutdown and control bank counters on B2

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

Counter drums increase value with downward movement
6.5.5.1c(2)

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

DISPLAYS SURVEY - TP-5.1 B3 13

DLCIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

DELAY IN OBTAINING READING

k) REVIEW AND RECOMMENDATIONS: MODIFY PRESENT DRUM COUNTERS OR
INSTALL DRUM COUNTERS THAT INCREASE WITH UPWARD
MOVEMENT.

• EQUIPMENT IS STANDARD TO ALL W PLANTS

• LIKELIHOOD OF ERROR IS LOW

• OPERATOR HAS DIGITAL ROD POSITION INDICATION ON VERT. BD.

• NOT POSSIBLE TO MODIFY, NOR IS IT COST EFFECTIVE TO REPLACE
EXISTING EQUIPMENT.

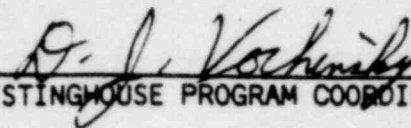
• NO CHANGE RECOMMENDED.



ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER



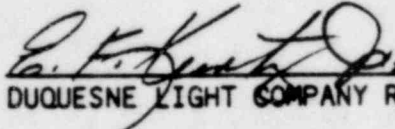
WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

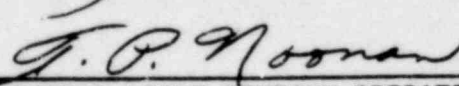
No Action



DUQUESNE LIGHT COMPANY ENGINEERING MANAGER



DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER



DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) BVDC 2
PLANT/UNIT

b) ORIGINATOR: ENTER DATE c) HED NO.: 28XX-2503

d) REVIEWED BY: M. J. Catullo e) DATE: 2/10/84
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: POOR CONTRAST WITH WHITE LETTERS ON
BLACK DRUM SURFACE

g) ITEMS INVOLVED: DRUM COUNTERS ON PANEL:

2A-4 (760, 90, 733, 992)

3B-2 (327, 326A, 326B, 326C, 326D, 328A, 328B, 328C, 328D, 328E,
328F, 328G, 328H)

3C-2 (144)

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

WHITE LETTERS ON BLACK DRUM SURFACE HAVE POOR
CONTRAST, SHOULD BE BLACK LETTERS ON WHITE
DRUM SURFACE — 6.5.5.1a(4)

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

DISPLAY CURVE 1 - TP 5.1 B3.02

DLCIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:


CAN RESULT IN A DELAY IN THE READING OF
THE DRUM COUNTER

k) REVIEW AND RECOMMENDATIONS:

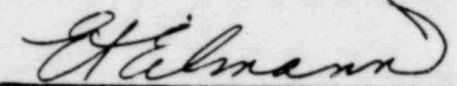
CHANGE THE DRUM COOPTERS - USE W- E - 55E,
ON BLACK SURFACE

• CONTRAST IS GOOD IN ALL CASES.


• NO ACTION RECOMMENDED



ESSEX HUMAN FACTORS PROJECT MANAGER



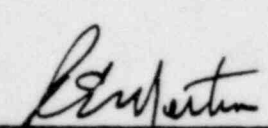
DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER



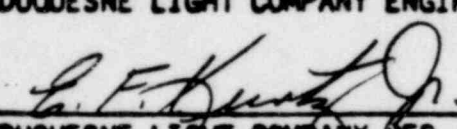
WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

No Action



DUQUESNE LIGHT COMPANY ENGINEERING MANAGER



DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER



DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS-2

PLANT/UNIT

b) ORIGINATOR: - MADELINE RYABY

c) HED NO.: ~~2~~XXX-3001

d) REVIEWED BY:

W. J. Catullo Jr.
(Westinghouse)

e) DATE: OCT. 12, 1984

T. J. Vora
(Essex)

f) HED TITLE: SKIRT DIAMETER ON CONTINUOUS ADJUSTMENT

ROTARY CONTROLS

g) ITEMS INVOLVED:

SKIRTS ON CONTINUOUS ROTARIES ON PANELS:

VCB

SKIRTS ON CONTINUOUS ROTARIES ON PROCESS CONTROLLERS,
(ALL PANELS)

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

SKIRT DIAMETER (D_s) < 2.0 INCHES (recommended diameter)

6.4.4.4.e (1)

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

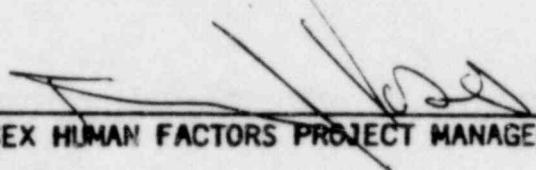
CONTROLS SURVEY: TP 4.1 B1.1 1.4 D L C IN R403

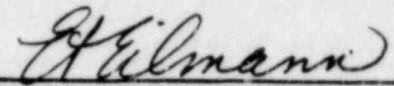
j) SPECIFIC HUMAN ERROR(S) OR EQUIPMENT DESIGN PROBLEM:

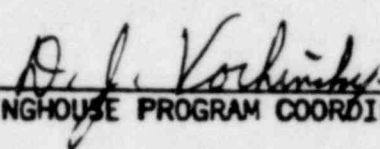
DIFFICULTY IN ADJUSTING PROPERLY.

k) REVIEW AND RECOMMENDATIONS:

- INCREASE SKIRT DIAMETER TO 2.0 INCHES WHERE POSSIBLE.
- SKIRT SIZE DOES NOT PREVENT PROPER ADJUSTMENT ON ANY CONTROLS. THE ONLY WAY TO COMPLY WITH GUIDELINES WOULD BE TO REMOVE AND REPLACE ALL SWITCHES OF THIS TYPE WITH A SWITCH OF A DIFFERENT TYPE.
- NO ACTION RECOMMENDED

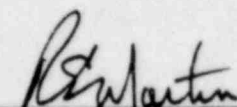

ESSEX HUMAN FACTORS PROJECT MANAGER

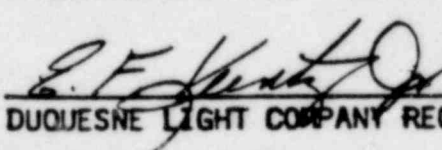

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

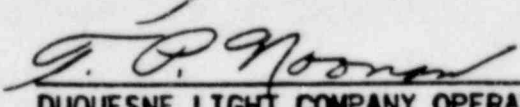

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

No Action


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) BVPS/2
PLANT/UNIT

b) ORIGINATOR: D. J. VOCHINSKY c) HED NO.: 2***-3063

d) REVIEWED BY: *D. J. Vochinsky*
(Westinghouse) e) DATE: 1/22/85

[Signature]
(Essex)

f) HED TITLE: MISSING REACTOR HEAD VENT VALVE SWITCHES

g) ITEMS INVOLVED:
REACTOR HEAD VENT VALVE SWITCHES

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:
REACTOR HEAD VENT VALVE SWITCHES TO CONTROL THE
OPERATION OF THE VALVES DO NOT EXIST ON THE MAIN
CONTROL BOARD Later drawing shows 4 of 6 valves. Two
3.7.2.1 valves still missing.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

VERIFICATION OF AVAILABILITY, R405, 6.2.1.1

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

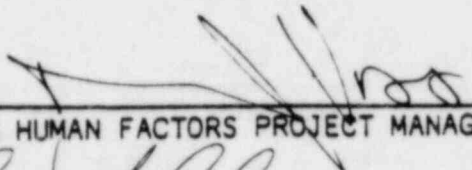
DEVICES DO NOT EXIST ON THE MAIN CONTROL
BOARD TO PROVIDE THE CONTROL NECESSARY TO
IMPLEMENT THE FOLLOWING OPERATOR TASKS: FR-C.1, 10,
18; FR-H.1, 16.

k) REVIEW AND RECOMMENDATIONS:

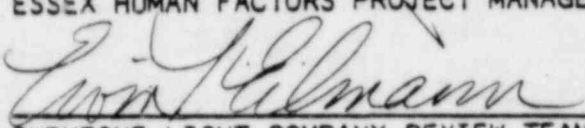
PROVIDE RCS REACTOR HEAD VENT VALVE CONTROL
SWITCHES ON THE MAIN CONTROL BOARD

Will check further to see if there are controls to be
added for other valves.

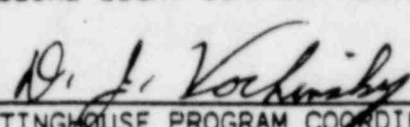
- CONTROLS FOR ALL 6 VALVES HAVE BEEN FOUND
ON A LATER REVISION OF DRAWINGS.
NO ACTION NECESSARY.



ESSEX HUMAN FACTORS PROJECT MANAGER



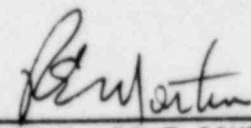
DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER



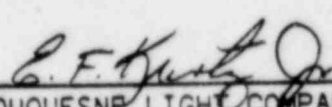
WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

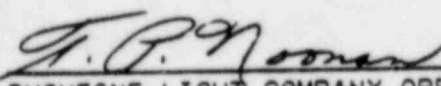
No Action



DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 6-21-85

DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER



DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

5

a) BVPS/2
PLANT/UNIT

b) ORIGINATOR: D. J. VOCHINSKY c) HED NO.: 2***-3004

d) REVIEWED BY: D. J. Vochinsky e) DATE: 1/22/85
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: MISSING SI ACCUMULATOR NITROGEN FILL AND
HEADER VENT VALVE SWITCHES

g) ITEMS INVOLVED:
SI ACCUMULATOR NITROGEN FILL VALVE SWITCHES 2 GNS*SOV
853 D, E, F.

NITROGEN HEADER VENT VALVE SWITCHES 2 GNS*SOV 854 A, B

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

THREE SI ACCUMULATOR NITROGEN FILL VALVE SWITCHES
AND TWO NITROGEN HEADER VENT VALVE SWITCHES DO NOT
EXIST ON THE MAIN CONTROL BOARD

3.7.2.1

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

VERIFICATION OF AVAILABILITY, R 405, 6.2.1.1

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

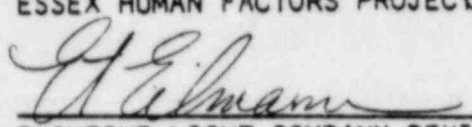
DEVICES DO NOT EXIST ON THE MAIN CONTROL BOARD
TO PROVIDE THE NECESSARY CONTROL TO IMPLEMENT THE
FOLLOWING OPERATOR TASKS: ES-1.2, 25; ES-3.3, 2;
FR-C.1, 12; FR-C.1, 20; FR-P.1, 15.

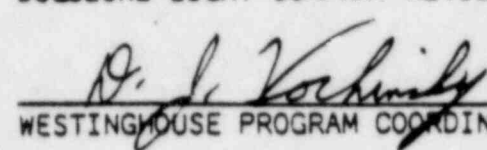
k) REVIEW AND RECOMMENDATIONS:

PROVIDE SI ACCUMULATOR NITROGEN FILL VALVE AND
NITROGEN HEADER VENT VALVE SWITCHES ON THE MAIN
CONTROL BOARD

Switches for Valves are shown on revised drawings. No
further action needed.


ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

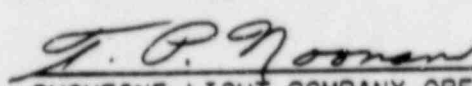

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

No Action


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 6-21-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS/2
PLANT/UNIT

7

b) ORIGINATOR: D. J. VOCHINSKY c) HED NO.: 2***-3005

d) REVIEWED BY: D. J. Vochinsky e) DATE: 1/23/85
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: MISSING HYDROGEN RECOMBINERS STATUS

INDICATION AND CONTROLS

g) ITEMS INVOLVED:
HYDROGEN RECOMBINERS

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:
HYDROGEN RECOMBINERS STATUS INDICATION AND CONTROLS DO
NOT EXIST ON THE MAIN CONTROL BOARD

3.7.2.1

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

VERIFICATION OF AVAILABILITY, R405, 6.2.1.1


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:
INDICATION AND CONTROL DEVICES DO NOT EXIST ON THE
MAIN CONTROL BOARD TO PROVIDE THE INFORMATION AND CONTROL
NECESSARY TO IMPLEMENT THE FOLLOWING OPERATOR TASKS:
ES-1.3,9; FR-C.1,8; E-0,20; E-1,16; FR-Z.1,6,9.

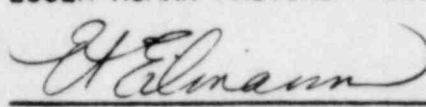
k) REVIEW AND RECOMMENDATIONS:

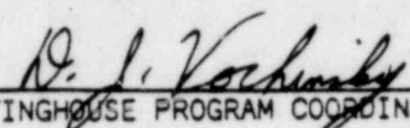
PROVIDE HYDROGEN RECOMBINER INDICATION AND CONTROLS ON THE MAIN CONTROL BOARD

Have been added, ~~will be~~^{are} shown on revised drawings. Resolved.

• No Action


ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

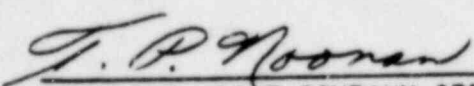

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

No Action


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 6-21-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

9

a) BVPS/2
PLANT/UNIT

b) ORIGINATOR: D. J. VOCHINSKY

c) HED NO.: 28A*-3007

d) REVIEWED BY: *D. J. Vochinsky*
(Westinghouse)

e) DATE: 1/29/85

[Signature]
(Essex)

f) HED TITLE: MISSING SIS EQUIPMENT STATUS INDICATION
AND CONTROLS

g) ITEMS INVOLVED:

SERVICE WATER STRAINERS 2 SWS*STRN4748
ALTERNATE MINI FLOW ISOLATION VALVES 2CHS*MOV 380A,B
~~3.7.2.1~~

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

STRAINER AND VALVE CONTROLS AND STATUS INDICATION
DO NOT EXIST ON THE MAIN CONTROL BOARD

3.7.2.1

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

VERIFICATION OF AVAILABILITY, R405, 6.2.1.1

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

DEVICES DO NOT EXIST ON THE MAIN CONTROL BOARD
TO PROVIDE THE INFORMATION AND CONTROL NECESSARY
TO IMPLEMENT THE FOLLOWING OPERATOR TASK;
E-O, 21 (ATTACHMENT)


k) REVIEW AND RECOMMENDATIONS:

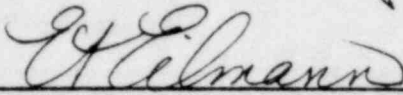
PROVIDE SWITCHES AND STATUS LIGHTS FOR THE STRAINERS AND ISOLATION VALVES ON SECTION BA OF THE MAIN CONTROL ~~PLANE~~ BOARD.

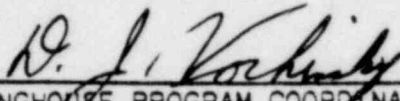
SW strainer switch is local, but remains in automatic functioning. There is an annunciator on MCB to indicate trouble.

Mini Flow Isolation Valves are on revised drawing (will be installed on main boards).

• No action needed.


ESSEX HUMAN FACTORS PROJECT MANAGER

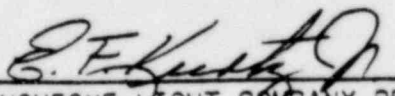

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

No Action


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 6-21-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) BVPS /2
PLANT/UNIT

8

b) ORIGINATOR: D. J. VOCHINSKY c) HED NO.: 2BC*-3008d) REVIEWED BY: D. J. Vochinsky e) DATE: 2/14/85
(Westinghouse)(Essex)f) HED TITLE: MISSING FW PUMP DISCHARGE VALVE BYPASSVALVES SWITCHES AND STATUS LIGHTS

g) ITEMS INVOLVED:

VALVES 2 FWS-299, 300, 318

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

VALVE SWITCHES AND VALVE STATUS LIGHTS3.7.2.1

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

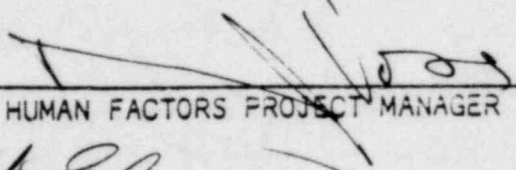
VERIFICATION OF AVAILABILITY, R405, 6.2.1.1

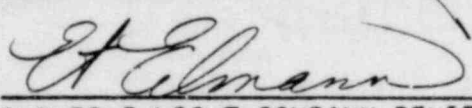
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

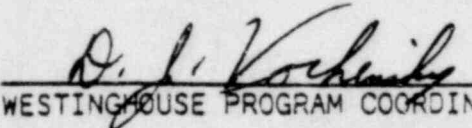
DEVICES DO NOT EXIST ON THE MAIN CONTROL BOARD TO PROVIDE THE INFORMATION AND CONTROL NECESSARY TO IMPLEMENT THE FOLLOWING OPERATOR TASK: FR-H.1, 6, 7

k) REVIEW AND RECOMMENDATIONS:

VALVES ARE LOCAL, MANUAL VALVES. PROCEDURE SHOULD BE REVISED AND TRAINING SHOULD EMPHASIZE VALVE LOCATION


ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

VALVES ARE NOT USED IN EMERG PROCEDURES

No Action

7/24/85 -

Valves ~~are~~ are
called out in

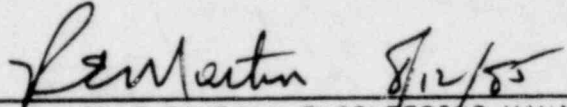
FR-4.1 which

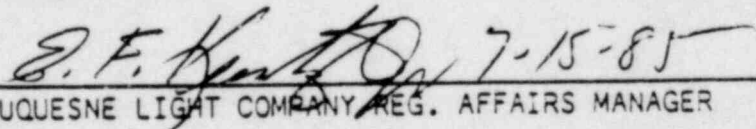
is an emergency

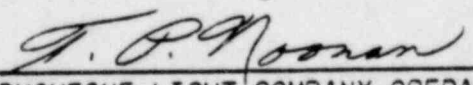
procedure, i.e.

their location

should be identified.


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) BVPS/2
PLANT/UNIT

b) ORIGINATOR: D. J. VOCHINSKY

c) HED NO.: 2BA*-3004

d) REVIEWED BY: G. J. Vochinsky
(Westinghouse)

e) DATE: 1/30/85

[Signature]
(Essex)

f) HED TITLE: MISSING CONTAINMENT ISOLATION PHASE A VALVES
SWITCHES & LIGHTS

g) ITEMS INVOLVED:

VALVES NOT CHECKED ON ATTACHED E-O, ATTACHMENT 4
CHECKLIST (pp 1, 3, 4, 6, 7, 8)

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

VALVE SWITCHES AND STATUS LIGHTS DO NOT EXIST ON
THE MAIN CONTROL BOARD

3.7.2.1

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

VERIFICATION OF AVAILABILITY, R405, 6.2.1.1

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

DEVICES DO NOT EXIST ON THE MAIN CONTROL BOARD
TO PROVIDE THE INFORMATION AND CONTROL NECESSARY FOR
THE IMPLEMENTATION OF THE FOLLOWING TASK:
E-O, STEP 21 (ATTACHMENT 4).

k) REVIEW AND RECOMMENDATIONS:

PROVIDE SWITCHES AND VALVE STATUS LIGHTS ON THE MAIN CONTROL BOARD FOR VALVES NOT CHECKED ON E-0, ATTACHMENT 4. ADD TO SECTION BA.

Air Activity Monitor Inlets (2 LVS + ^{TV}OV153A + ^{TV}OV153B) are incorrectly identified in EOB attachment as SOV153A+B. These are on MCB, procedure attachment is to be corrected
4/11/85 DLR and SW will check remainder of valves to see if they are on MCB. - Found on actual control board

"Benchboard Section C" should read "Building Service Control Panels" on pages 7 & 8 of Attachment 4. OK

NO ACTION

ESSEX HUMAN FACTORS PROJECT MANAGER

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

No Action

DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER

DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

2BA*-3009

NUMBER	TITLE
E-0	Reactor Trip or Safety Injection

ATTACHMENT 4

CONTAINMENT ISOLATION PHASE A CHECKLIST

MARK NO.	DESCRIPTION	REQUIRED	POWER SUPPLY	INITIALS
	Benchboard Section A			✓
2RCS*AOV519 BA1 (SOV 519)	Primary Grade Water To Pressurizing Relief Tank	Closed	[PNL*DC2-10] Bkr 8-12	✓
2RCS*AOV101 (SOV 101)	N ₂ Supply Manifold To Pressurizer Relief Tank	Closed	[PNL*DC2-10] Bkr 8-13	✓
2GNS*AOV101-1 (SOV 101-1) BA1	N ₂ Supply Manifold To Safety Injection Accumulator	Closed	[PNL*DC2-11] Bkr 8-4	✓
2GNS*AOV101-2 (SOV101-2) BA1	N ₂ Supply Manifold To Safety Injection Accumulator	Closed	[AUL*DC2-02] Bkr 8-11	✓
2DGS*AOV108A (SOV108A3) BA1	Primary Drains Transfer Pump No. 1 Discharge	Closed	[PNL*DC2-08] Bkr 8-4	✓
2DGS*AOV108B (SOV 108B) BA1	Primary Drains Transfer Pump No. 1 Discharge	Closed	[PNL*DC2-10] Bkr 8-17	✓
2DAS*AOV100A (SOV 100A) BA1	Reactor Containment Sump Pump Discharge	Closed	[PNL*DC2-07] Bkr 8-20	✓
2DAS*AOV100B (SOV-100B) BA1	Reactor Containment Sump Pump Discharge	Closed	[PNL*DC2-10] Bkr 8-4	✓
A 2CVS*SOV153A	Air Activity Monitor Inlet	Closed	[PNL*DC2-11] Bkr Ckt. CVSAB 11 AG	✓
A 2CVS*SOV153B	Air Activity Monitor Inlet	Closed	[PNL*DC2-10] Bkr Ckt. CVSBB 11 AG	✓
2CVS*SOV151A 2CVS*AOV151A	Containment Vacuum Pumps Suction	Closed	[PNL*DC2-11] Bkr Ckt. CVSAC 11 AG	✓

BA1

28A #3009

NUMBER	TITLE
E-O	Reactor Trip or Safety Injection

ATTACHMENT 4

MARK NO.	DESCRIPTION	REQUIRED	POWER SUPPLY	INITIALS
	Benchboard Section A (Continued)			✓
2CHS*AOV204 BA1	Letdown Isolation	Closed	[PNL*DC2-06], Bkr 8-25 & [PNL*DC2-10], Bkr 8-18	✓
2CHS*MOV378 BA4	RCP Seal Water Return	Closed	[MCC 2-E05], Bkr 4C	✓
2CHS*MOV381 BA4	RCP Seal Water Return	Closed	[MCC*2-E06], Bkr 4C	✓
2SWS*MOV107A BA1	Secondary CCW Heat Exchanger	Closed	[MCC*2-E03], Bkr 6A	✓
2SWS*MOV107B BA2	Secondary CCW Heat Exchanger	Closed	[MCC*2-E04], Bkr 6C	✓
2SWS*MOV107C BA1	Secondary CCW Heat Exchanger	Closed	[MCC*2-E03], Bkr 6C	✓
2SWS*MOV107D BA2	Secondary CCW Heat Exchanger	Closed	[MCC*2-E04], Bkr 7A	✓
2SSR*AOV109A1 BA1	Safety Injection Accumulator Sample Inside Containment Isol.	Closed	[PNL*DC2-03], Bkr 8-11	✓
2SSR*SOV130A1	PRT Gas Sample Inside Containment Isol.	Closed	[PNL*DC2-03], Bkr 8-20	✓
2SSR*AOV100A1 BA1	Pressurizer Liquid Space Sample Inside Containment Isol.	Closed	[PNL*DC2-03], Bkr 8-11	✓
2SSR-AOV112A1 BA1	Pressurizer Vapor Space Sample Inside Containment Isol.	Closed	[PNL*DC2-03], Bkr 8-11	✓

2BA*-3009

NUMBER	TITLE
E-0	Reactor Trip or Safety Injection

ATTACHMENT 4

MARK NO.	DESCRIPTION	REQUIRED	POWER SUPPLY	INITIALS
Benchboard Section A (Continued)				
2SSR*AOV102A1 BA1	RCS Cold Leg Sample Outside Containment Isol.	Closed	[PNL*AC2-E8], Bkr 8-11	✓
2SSR*SOV128A1	RCS Hot Leg Sample Inside Containment Isol.	Closed	[PNL*DC2-03], Bkr 8-20	✓
2SSR*SOV129A1	^S RHX Sample Inside Containment Isol.	Closed	[PNL*DC2-03], Bkr 3-22	✓
2SSR*AOV109A2 BA1	Safety Injection Accumulator Sample Outside Containment Isol.	Closed	[PNL*DC2-10], Bkr 8-11	✓
2SSR*SOV130A2	PRT Gas Sample Outside Containment Isol.	Closed	[PNL*DC2-10], Bkr 8-27	✓
2SSR*AOV100A2 BA1	Pressurizer Liquid Space Sample Outside Containment Isol.	Closed	[PNL*DC2-10], Bkr 8-1	✓
2SSR*AOV112A2 BA1	Pressurizer Vapor Space Sample Outside Containment Isol.	Closed	[PNL*DC2-10], Bkr 8-1	✓
2SSR*AOV102A2	RCS Cold Leg Sample, Outside Containment Isolation	Closed	[PNL*AC2-E8], Bkr 8-1	✓
2SSR*SOV128A2	RCS Hot Leg Sample Outside Containment Isol.	Closed	[PNL*DC2-10], Bkr 8-2	✓
2SSR*AOV129A2	^S RHX Sample Outside Containment Isol.	Closed	(later)	✓
2PAS*SOV105A1	(later)	(later)	(later)	✓
2PAS*SOV105A2	(later)	(later)	(later)	✓
2CVS*SOV102	Air Activity Monitor Outlet	Closed	[PNL*DC2-10], Bkr Ckt CUSBB 11 AG	✓

NUMBER	TITLE
E-O	Reactor Trip or Safety Injection

ATTACHMENT 4

MARK NO.	DESCRIPTION	REQUIRED	POWER SUPPLY	INITIALS
	Benchboard - Section C			
2IAC*MOV130	CNMT Instrument Air CNMT Isolation Valve	Closed	(later)	✓
2IAC*MOV133	CNMT Instrument Air CNMT Isolation Valve	Closed	(later)	✓
2IAC*MOV134	CNMT Instrument Air CNMT Isolation Valve	Closed	(later)	✓
	Building Service Control Panels (Trains A and B) (Continued)			
2HVS*MOD202B	Leak Collection to Main Filter	Closed	[PNL*AC2-E2], Bkr 2-11	✓
2HVS*MOD218A	Leak Collection Filter Isol. Damper	Closed	[PNL*AC2-E1], Bkr 1-12	✓
2HVS*MOD218B	Leak Collection Filter Isol. Damper	Closed	[PNL*AC-E2], Bkr 2-13	✓
2FPW*AOV204	Charcoal Filter Deluge	Closed	[PNL*AC2-E1], Bkr 1-23	✓
2FPW*AOV221	Charcoal Filter Deluge	Closed	[PNL-AC2-E1], Bkr 1-24	✓
2FPW*AOV205	Containment Deluge Valve	Closed	[PNL-DC2-07], Bkr 8-12	✓
2FPW*AOV206	Containment Hose Racks	Closed	[PNL*DC2-07], Bkr 8-13	✓

2BA*-3009

NUMBER	TITLE
E-O	Reactor Trip or Safety Injection

ATTACHMENT 4

MARK NO.	DESCRIPTION	REQUIRED	POWER SUPPLY	INITIALS
	<i>Building Services Control Panels (Continued)</i> Benchboard Section C (Continued)			
2HVP*MOD22A	Aux. Bldg. Exhaust to Main Filter Bank Dampers	Closed	[PNL*AC2-E1], Bkr 1-9	✓
2HVP*MOD22B	Aux. Bldg. Exhaust to Main Filter Bank Dampers	Closed	[PNL*AC2-E2], Bkr 2-9	✓
2HVS*MOD203A	Leak Collection Filter Isol.	Closed	[PNL*AC2-E1], Bkr 1-12	✓
2HVS*MOD203B	Leak Collection Filter Isol.	Closed	[PNL*AC2-E2], Bkr 2-12	✓
2HVS*MOD201A	Leak Collection Filter Bypass	Closed	[PNL*AC2-E1], Bkr 1-11	✓
2HVS*MOD201B	Leak Collection Filter Bypass	Closed	[PNL*AC2-E2], Bkr 2-11	✓
2HVS*MOD202A	Leak Collection to Main Filter	Closed	[PNL*AC2-E1], Bkr 1-11	✓
2HVS*MOD210A	Supplementary Leak Collection Damper	Open	[PNL*AC2-E1], Bkr 13	✓
2HVS*MOD210B	Supplementary Leak Collection Damper	Open	[PNL*AC2-E2], Bkr 13	✓
2HVS*MOD211A	Supplementary Leak Collection Damper	Open	[PNL*AC2-E1], Bkr 13	✓
2HVS*MOD211B	Supplementary Leak Collection Damper	Open	[PNL*AC2-E2], Bkr 13	✓

2BA*-3009

NUMBER	TITLE
E-O	Reactor Trip or Safety Injection

ATTACHMENT 4

MARK NO.	DESCRIPTION	REQUIRED	POWER SUPPLY	INITIALS
	<i>Building Services Control Panel (continued)</i> Benchboard Section C (Continued)			
2HVS*MOD212A	Supplementary Leak Collection Damper	Open	[PNL*AC2-E1], Bkr 14	✓
2HVS*MOD212B	Supplementary Leak Collection Damper	Open	[PNL*AC2-E2], Bkr 14	✓
2HVS*MOD213A	Supplementary Leak Collection Damper	Open	[PNL*AC2-E1], Bkr 14	✓
2HVS*MOD213B	Supplementary Leak Collection Damper	Open	[PNL*AC2-E2], Bkr 14	✓
2HVS*CH219A	Supplementary Leak Collection Heater	On	[480V 2-8] Cu 10C	✓
2HVS*CH219B	Supplementary Leak Collection Heater	On	[480V 2-9], Cu 10C	✓

-END-

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

5

a) BVPS/2
PLANT/UNIT

b) ORIGINATOR: D. J. VOCHINSKY c) HED NO.: 2***-3010

d) REVIEWED BY: *D. J. Vochinsky*
(Westinghouse) e) DATE: 1/31/85

[Signature]
(Essex)

f) HED TITLE: MISSING CONTAINMENT INSTRUMENT AIR VALVES

SWITCHES AND STATUS LIGHTS

g) ITEMS INVOLVED:
CONTAINMENT INSTRUMENT AIR VALVES 21AC*MOV133, 134,
130

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:
VALVE SWITCHES AND STATUS LIGHTS DO NOT EXIST ON
THE MAIN CONTROL BOARD.

3.7.2.1

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

VERIFICATION OF AVAILABILITY, R405, 6.2.1.1

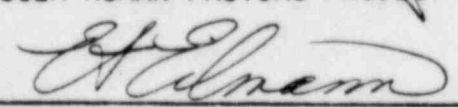
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:
DEVICES DO NOT EXIST ON THE MAIN CONTROL BOARD TO
PROVIDE THE CONTROL AND INFORMATION NECESSARY TO
IMPLEMENT THE FOLLOWING OPERATOR TASKS: E-0, 38;
E S-1.1, 5; E-311; FR-H, 1, 14.

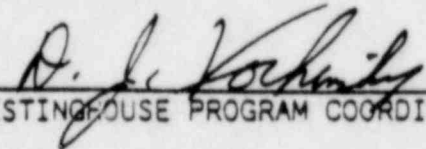
K) REVIEW AND RECOMMENDATIONS:

PROVIDE SWITCHES AND STATUS LIGHTS FOR THE CONTAINMENT
INSTRUMENT AIR VALVES ON THE MAIN CONTROL BOARD.

The above are on a later revision of the control
board drawing and will be installed on boards. Resolved
• No ACTION


ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

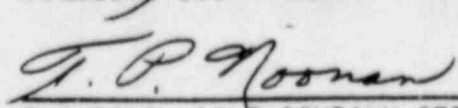

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

No Action


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 6-21-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS-2
PLANT/UNIT

9

b) ORIGINATOR: M. Francher c) HED NO.: 2AB1-3011

d) REVIEWED BY: D. J. Vorhiesky e) DATE: 1/29/85
(Westinghouse)

T. Voss
(Essex)

f) HED TITLE: Controls are not grouped in
a logical order

g) ITEMS INVOLVED: Pressurizer Heaters Controls
2RCP - H2A, 2B, 2C, 2D, 2E

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.822a.

Components are not arranged left to right
in an alphabetic sequence
Present arrangement is C A D B E

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Verification of Task Performance Capabilities,
Suitability (R405) 6.2.1.2
Validation (R406)

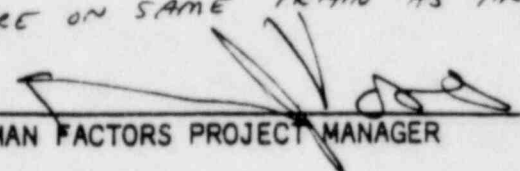
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Operator may respond incorrectly

k) REVIEW AND RECOMMENDATIONS:

It is suggested that the sequence be arranged in a more logical manner (ARDE), unless the man control sequence (C ARDE) might be a better sequence.

~~Handwritten text crossed out~~
C IS THE MAIN CONTROL; A & D ARE ON SAME TRAIN AS ARE B & E, OPERATOR, ~~ONLY~~ IN AN EMERGENCY, IS ONLY SUPPOSED TO HAVE ONE TRAIN OF HEATERS ON AT A TIME, THEREFORE GROUPING IS LOGICAL.


ESSEX HUMAN FACTORS PROJECT MANAGER

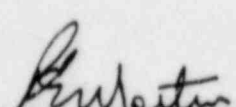

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

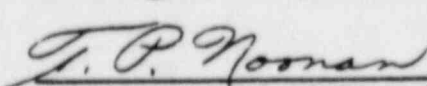
NO ACTION

1) REVIEW AND DISPOSITION:

No Action


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 6-21-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS/2
PLANT/UNIT

6

b) ORIGINATOR: D. J. VOCHINSKY c) HED NO.: 2***-3012

d) REVIEWED BY: D. J. Vochinsky e) DATE: 1/22/85
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: MISSING SOURCE RANGE DETECTOR VOLTAGE CONTROL

g) ITEMS INVOLVED:

SOURCE RANGE NEUTRON DETECTOR HIGH VOLTAGE SWITCH

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

A SOURCE RANGE DETECTOR VOLTAGE ENERGIZE/DEENERGIZE SWITCH DOES NOT EXIST ON THE MAIN CONTROL BOARD

3.7.2.1

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:


VERIFICATION OF AVAILABILITY, R405, 6.2.1.1

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

DEVICE DOES NOT EXIST ON THE MAIN CONTROL BOARD TO PROVIDE THE CONTROL NECESSARY TO IMPLEMENT THE FOLLOWING OPERATOR TASKS; ES-1.1, 25; ES-1.2, 29; E-3, 37.

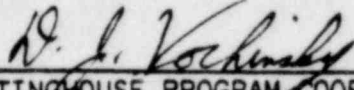
k) REVIEW AND RECOMMENDATIONS:

- PROVIDE SOURCE RANGE DETECTOR VOLTAGE SWITCH (ES) ON THE MAIN CONTROL BOARD.
- Or revise procedure to indicate location and identification of switch used to control source range detector voltage.
- Procedure change.


ESSEX HUMAN FACTORS PROJECT MANAGER

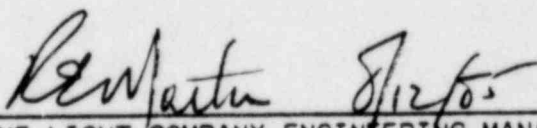
3


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

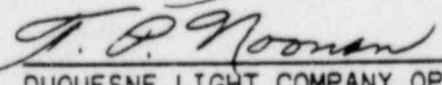

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

No switch needed. This was misinterpreted
by HFE personnel not familiar w/ P-6, P-10
& Source range operation
No action


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) BVPS-2
PLANT/UNIT

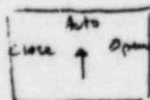
b) ORIGINATOR: M. Francher c) HED NO.: 2BB1-3013

d) REVIEWED BY: D. J. Vorkensky e) DATE: 3/25/85
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: valves do not have a "maintain
in open" to keep open" position "Pull to e

g) ITEMS INVOLVED: 2 RCS-MOV 536, 537, 535
PORV block valves



Spring Return to Auto, maintain closed (dwg E-36
detail BH-2)

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.4.1.1 a. controls are
not adequate for the function to be performed. These spring return
-to-close valves have to be held open to perform the
required action.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

Validation of Control Room Function (R406)

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Operators response will be delayed.

k) REVIEW AND RECOMMENDATIONS: It is recommended that an auto override, ^{maintain in open} ~~a pull to lock open~~, or a manual/open button be installed.

RT recommendations:

As part of the Cold Overprotection System Armed-Block switches are to be installed for MOV-535 + MOV-536. In Armed position these switches will permit MOV-535 + MOV-536 to maintain in an "open" position. It is suggested that the EOPs be modified to describe this procedure. If all 3 block valves are needed to be opened, the operator could manually hold open MOV-537.

T. W. Voss
ESSEX HUMAN FACTORS PROJECT MANAGER

E. Elmann
DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

D. J. Kuchinski
WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

No Action Required - valve will arrive to full position with switch in center position.

R. E. Martin 8/26/85
DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

E. F. Kuchinski
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER

T. P. Noonan
DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

25. Pressurizer relief isolation valve 2RCS*MOV535 will open automatically provided there is no motor thermal overload and either of the following conditions exist:
 - a. Control switch 2RCS*MOV535 in "AUTO" and selector switch for cold overpressure protection Train B in "ARM"
 - b. Control switch 2RCS*MOV535 in "AUTO" and pressurizer pressure in 2/3 loops not low
26. Pressurizer relief isolation valve 2RCS*MOV535 will close provided there is no motor thermal overload and any of the following conditions exist:
 - a. Control switch 2RCS*MOV535 in "CLOSE"
 - b. Control switch 2RCS*MOV535 in "AUTO" and pressurizer pressure in 2/3 loops low selector switch for cold overpressure protection Train B in "BLOCK"
27. Pressurizer relief isolation valve 2RCS*MOV537 will open manually provided all of the following conditions exist:
 - a. Control switch 2RCS*MOV537 in "OPEN"
 - b. 2RCS*MOV537 no motor thermal overload
28. Pressurizer relief isolation valve 2RCS*MOV537 will open automatically provided there is no motor thermal overload and all of the following conditions exist:
 - a. Control switch 2RCS*MOV537 in "AUTO"
 - b. Pressurizer pressure in 2/3 loops not low
29. Pressurizer relief isolation valve 2RCS*MOV537 will close provided there is no motor thermal overload and any of the following conditions exist:
 - a. Control switch 2RCS*MOV537 in "CLOSE"
 - b. Control switch 2RCS*MOV537 in "AUTO" and pressurizer pressure in 2/3 loops low

Refer to LSK-25-6K

30. A manual mode of operation is available from the alternate shutdown panel for 2RCS*PCV456 pressurizer power relief valve. A pushbutton on the alternate shutdown panel will transfer control to the alternate shutdown panel from the control room. A manual reset at relay will transfer control from the alternate shutdown panel back to the control room.

25-6-9

20. Pressurizer heaters group D will be deenergized provided any of the following conditions exist:

- a. Control switch for group D heaters in "OFF"
- b. Control switch for group D heaters in "AUTO" and no pressurizer low pressure deviation signal and no pressurizer high level deviation signal
- c. Pressurizer low level signal
- d. Bus undervoltage
- e. Electrical protection trip
- f. Safety injection signal (train A)

Refer to LSK-25-6G

21. Pressurizer heaters group C will be energized provided all of the following conditions exist:

- a. Control switch for group C heaters in "ON"
- b. No bus undervoltage
- c. No electrical protection trip
- d. No pressurizer low level

22. Group C pressurizer heaters are controlled by proportional control to maintain operating pressure.

23. Pressurizer heaters group C will be deenergized provided any of the following conditions exist:

- a. Control switch for group C heaters in "OFF"
- b. Pressurizer low level signal
- c. Bus undervoltage
- d. Electrical protection trip

Refer to LSK-25-6J

24. Pressurizer relief isolation valve 2RCS*MOV535 will open manually provided all of the following conditions exist:

- a. Control switch 2RCS*MOV535 in "OPEN"
- b. 2RCS*MOV535 no motor thermal overload

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2BA4-301b

d) REVIEWED BY: A. J. Verhinsky e) DATE: 3/25/85
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: Label does not express intended action

g) ITEMS INVOLVED: "Seal Water Injection Filter"
2 CHS - HCV 186

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.6.3.2 a.

The words employed in the label do not express exactly what action is intended. The label reads "Seal Water injection filter" when actually it is an "RCP Seal Injection flow Controller"

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Validation of C.R. Functions (R406)


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:


May delay operators response or operator may respond incorrectly

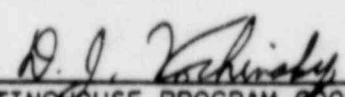
k) REVIEW AND RECOMMENDATIONS:

Change label to read:
RCP Seal Injection Flow Controller

RT recommends as per above


ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Labels are currently read as stated above.

No Action

2/14/85

Labels

Control Panel Pump

Injection

Flow Controller

Injection

Control Panel

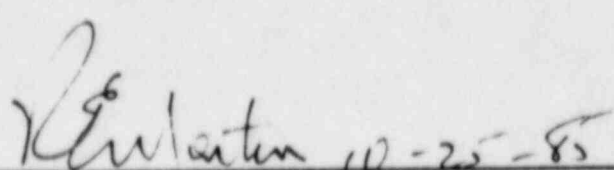
Injection

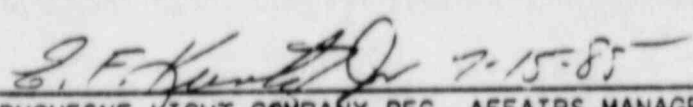
Flow Controller

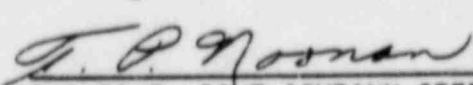
Injection

Control Panel

Injection


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2BAX-3017

d) REVIEWED BY: D. J. Vachon e) DATE: 3/28/85
(Westinghouse)

T. [Signature]
(Essex)

f) HED TITLE: Controls to be used together are
located on different panels

g) ITEMS INVOLVED:

charging line
isolation valves
[2CHS*MOV289 and 310]

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.8.1.1 a.

The listed controls are to be manipulated in the same step.
2CHS*MOV289 is located on BA1 and 2CHS*MOV310 is at BA4.
Operator movement is not minimized to promote efficient operation.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Validation of Control Room Functions
(R406)


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

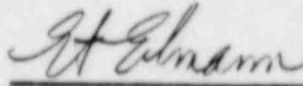
Delays due to operator movement
or search time.

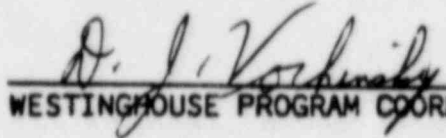
k) REVIEW AND RECOMMENDATIONS:

Valves should be located together on the same panel. If the control for 2CHS*MOV 289 is to be used most often in an emergency situation in conjunction with 2CHS*MOV 310 and other controls located on panel BA4, the preferred location for 2CHS*MOV 289 is panel BA4.

A similar problem has been identified in Unit 1 CROK (Unit 1 HES #88, 346, + 505). Similar resolutions should be applied to both units in the future.

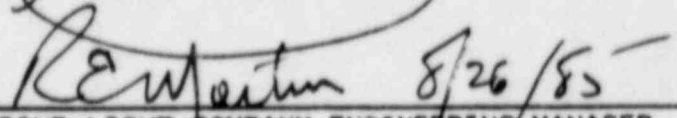

ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

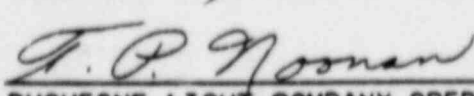

WESTINGHOUSE PROGRAM COORDINATOR

l) REVIEW AND DISPOSITION:

289 & 310 are part of normal charging; normal charging is typically not used in emergency situations. 289 is located in one particular area to be with containment isolation valves so that operators can quickly verify cont. isolation. No Action


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

a) BYPS-2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2BC2-3019

d) REVIEWED BY: D. J. Kohnen e) DATE: 5/6/85
(West Highhouse)

[Signature]
Essex)

f) HED TITLE: Throttle position missing from
A.F.W. Flow control valves

g) ITEMS INVOLVED: 2FWEX HCV 100 A,B,C,D,E,F
Aux. F.W. flow control valves

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.4.1.1 a.

The existing control does not provide a sufficient range of control. Currently only "open" and "Close" are available. There is no throttle position provided.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER: Verification of Task Performance Capabilities
- suitability (R405)

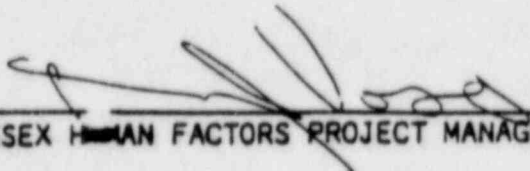
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Currently the operator is unable to perform the throttle function

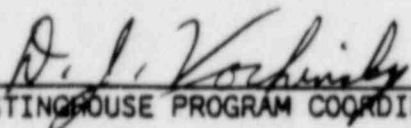
k) REVIEW AND RECOMMENDATIONS: Provide a controller with a throttling capability.

Valves have already been changed from OT 2 type to HCV's.

NO ACTION

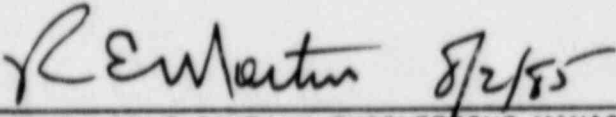

ESSEX HUMAN FACTORS PROJECT MANAGER

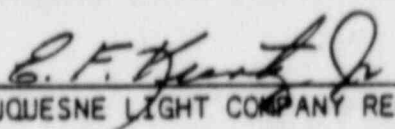

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

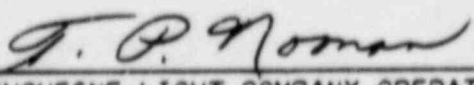

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

No Action

 8/2/85
DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 7-15-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: M. Francher c) HED NO.: 2ES1-3021

d) REVIEWED BY: A. J. Kachinsky
(Westinghouse) e) DATE: 5/13/85

[Signature]
(Essex)

f) HED TITLE: Emergency Shutdown Panel controls are
arranged different than those in the M.C.R.

g) ITEMS INVOLVED: 2 FWE * H CV 100 A, B, C, D, E, F

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.8.2.2 b.
The arrangement is different between the ESP and on the
MCB. The components are not arranged to
match an operators expectations. ~~see attached~~

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER: C:R. Surveys (R403)

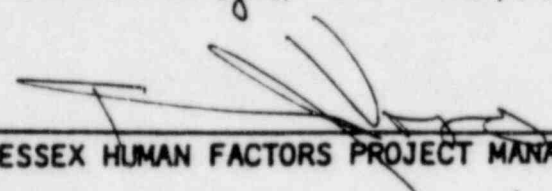
j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

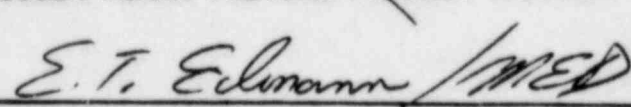
An operator used to the Main Control Board
arrangement, may have a delayed reaction or
may commit an error when faced with the
different arrangement on the Emergency Shutdown
Panel.

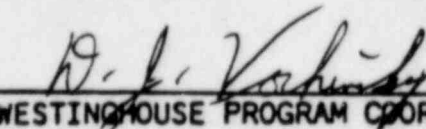
*1) REVIEW AND RECOMMENDATIONS: The arrangement of controls on the Main Control Board are being altered as per HED 2XXX-1201. It is suggested that the arrangement of valve controls on the ESP be identical to the suggested arrangement (backfit) of 2XXX-1201.

→ Arrangement of controls on ESP is correct. It is recommended that MCB controls mentioned in 2XXX-1201 be rearranged to match the ESP controls.

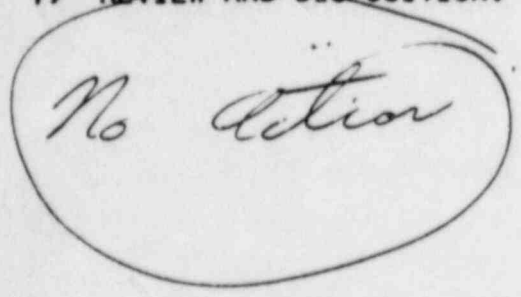
NO ACTION for this
HED

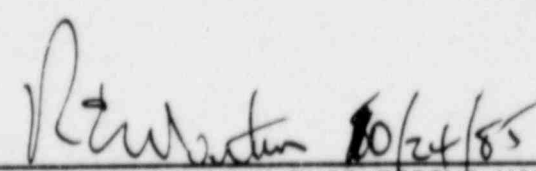

ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

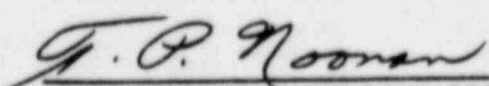

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:



 10/24/85
DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 7-15-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS - 2
PLANT/UNIT

b) ORIGINATOR: M Francher c) HED NO.: 2ABX3024

d) REVIEWED BY: D. J. Kochinsky
(Westinghouse) e) DATE: 6/5/85

[Signature]
(Essex)

f) HED TITLE: Controls are not within the functional reach of 95th percentile male or 5th percentile female on ASP.

g) ITEMS INVOLVED:

see attached list

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

(6.1.2.2 b), (6.1.2.2 d.2))

Some controls are positioned as much as 33 inches back from the console edge. This exceeds the set back limit of 25 inches and the controls are beyond the functional reach of 5th percentile female adults and 95th percentile male adults.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

CR Survey (R401B)

TP.1.2

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:


Operators are not accommodated and reaching the controls will require stretching.

k) REVIEW AND RECOMMENDATIONS: 1) From attached list, determine which controls affect operations or plant safety to the extent that they should be located lower on the board. Ensure controls are located no more than 25 inches from the front edge of the console.

2) Provide a stepstool and a hand rail so that all operators will be able to reach controls

Comparison measurements (see HED #2 BXX-140) reveal comparison reach requirements for the MCB. A 5'2" female operator could reach all controls on the MCB. The panel is not regularly used.

NO ACTION


ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

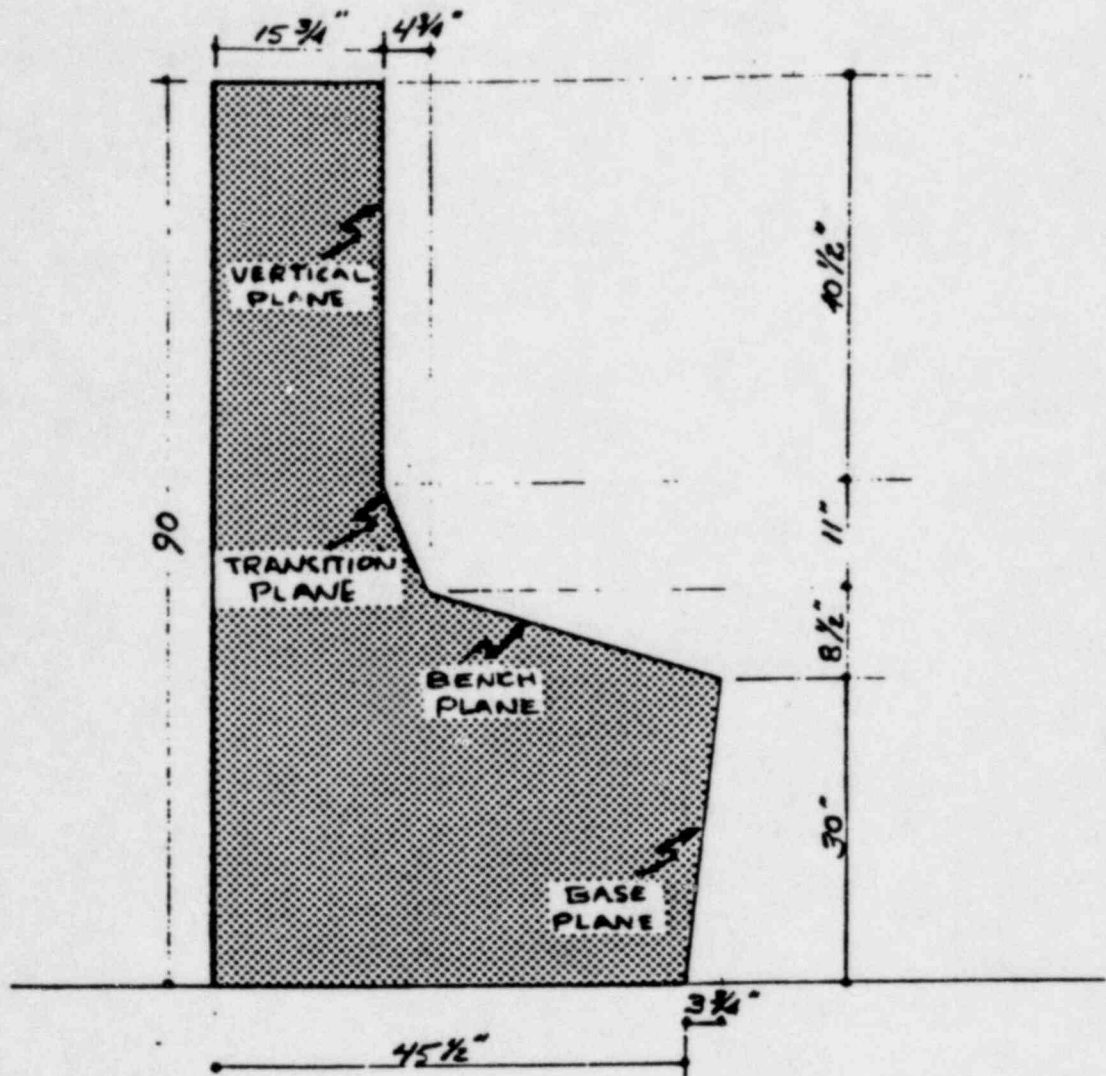
1) REVIEW AND DISPOSITION:

No Action


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 7-15-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER



From S&W
HFE Review
of ASP

FIGURE 8
ASP CONSOLE
DIMENSIONS

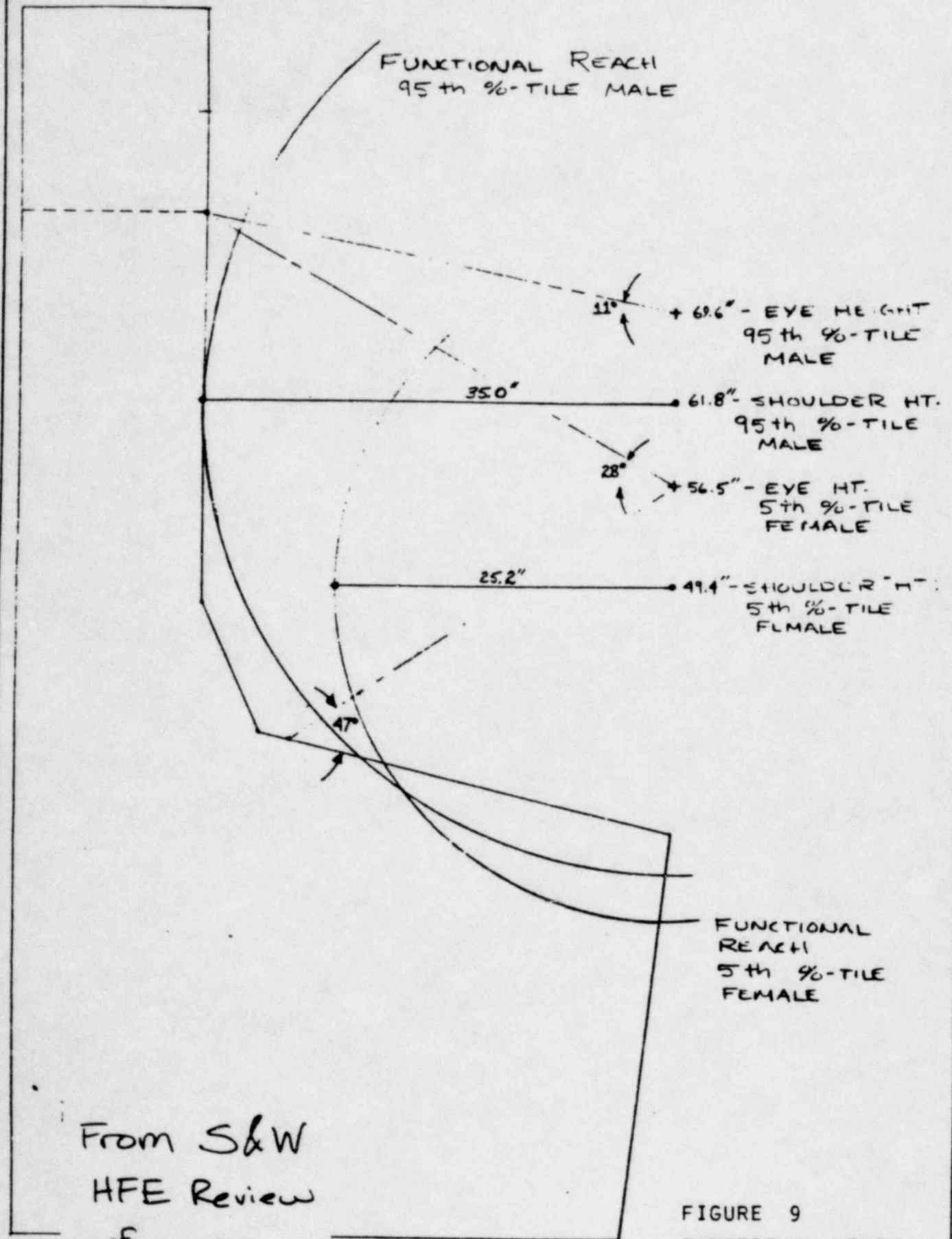
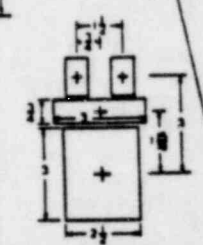
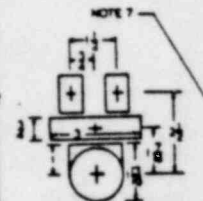
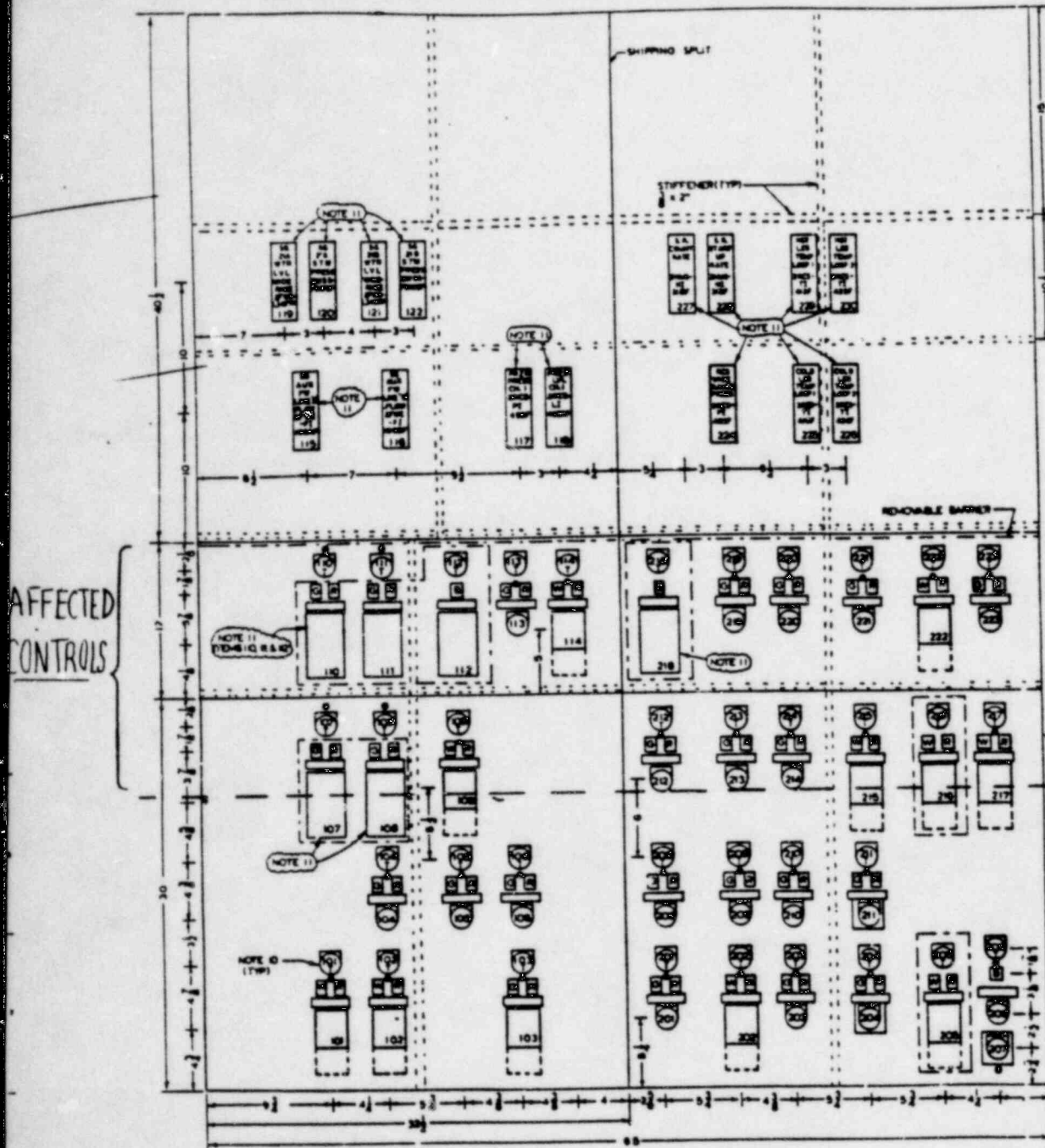


FIGURE 9

FUNCTIONAL REACH
AND VIEWING ANGLE
DIAGRAM

2 AB 4 - 3024

100BO-RE-25GA



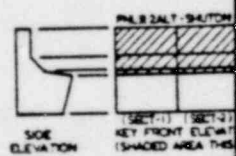
ITEM NO	QTY	DESCRIPTION
101	1	10T SWITCH
102	1	10T SWITCH
103	1	10T SWITCH
104	1	10T SWITCH
105	1	10T SWITCH
106	1	10T SWITCH
107	1	10T SWITCH
108	1	10T SWITCH
109	1	10T SWITCH
110	1	10T SWITCH
111	1	10T SWITCH
112	1	10T SWITCH
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195	1	10T SWITCH
196	1	10T SWITCH
197	1	10T SWITCH
198	1	10T SWITCH
199	1	10T SWITCH
200	1	10T SWITCH

AFFECTED CONTROLS

Functional Reach Limits of 1/2" Female

- NOTES
1. 0- INDICATES TRAIN A (ORANGE) & CHANNEL 1 (RED) DEVICES.
 2. --- INDICATES SHUTTER FOR SEPARATION OF TRAIN A (ORANGE), CHANNEL 1 (RED) & NON-TRAIN (BLACK) DEVICES.
 3. : : : : INDICATES STIFFENERS WELDED ON REAR OF PANEL.
 4. ALL INDICATING LIGHTS ARE WESTINGHOUSE RECTANGULAR MINILITE, CAT NO 150000 FOR AC CIRCUITS, CAT NO 150000 FOR DC CIRCUITS & CAT NO 150000 FOR OHM WHITE OPERATION LENSES & BULBS ARE AS FOLLOWS:
GREEN LENS STYLE NO 151500
RED LENS 151500
WHITE LENS 151500
BLUE LENS 151500
24V BULB 1124150
 5. ALTERNATE SHUTDOWN PANEL SHALL BE CONSTRUCTED OF COLD ROLLED STEEL PLATE 1/4" THICK FOR THE FACE OF THE BENCH & VERTICAL SECTIONS.
 6. WHITE LIGHT OHM-WHITE W STYLE NO 150000
RED LIGHT NORMAL W STYLE NO 150000
 7. ITEMS 204 & 211 TO HAVE SELECTOR SWITCH SAFETY LOCKOUTS W STYLE NO 07200
 8. ITEM 207 TO HAVE PUSHBUTTON SAFETY COVER W STYLE NO 07200
 9. DUPLEX OUTLETS (1 PER SECTION) TO BE TWO POLE, THREE WIRE, GROUNDED TWIST LOCK HUBBELL #4700 W/ 270V COVER
 10. ALL TRANSFER PUSHBUTTONS, IDENTIFIED BY SUPPLY TIT, E, OR ON ITEM NO SHALL READ "PUSH TO TRANSFER" ON ESCHTCHON PLATE.
 11. FIELD TO INSTALL.

REFERENCES
STEEL DETAILS SYSTEM CONT OHM NO 7478-SH
S & W FILE NO 2001 600-73-006
WIRING DIAGRAMS 100BO-RE-25GA
- 3EAB
- 3EAC
- 3EAD
- 3EAE
- 3EAF
- 3EAG
- 3EAH



STONE & WEBSTER ENGINEERING CORP
BOSTON MASS

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

5

a) BVPS/2
PLANT/UNIT

b) ORIGINATOR: D. J. VOCHINSKY c) HED NO.: 2***-3101

d) REVIEWED BY: D. J. Vochinsky e) DATE: 2/1/85
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: IDENTIFICATION OF CONTROLLER DEMAND
OR ACTUAL STATUS

g) ITEMS INVOLVED:

CONTROL STATIONS (SEE ATTACHED LIST)

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

CONTROL STATION INDICATORS ARE NOT IDENTIFIED AS
WHETHER THEY REFLECT DEMAND OR ACTUAL STATUS.

6.5.1, 1e(1)

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

VERIFICATION OF AVAILABILITY, R405, PARA. 6.2.3;
TP-9.2


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

OPERATOR CONFUSION EXISTS BECAUSE CONTROL
STATION INDICATORS ARE NOT IDENTIFIED AS TO
WHETHER THEY REFLECT DEMAND OR ACTUAL STATUS

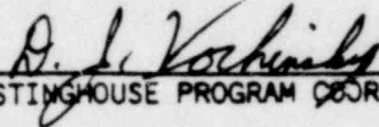
k) REVIEW AND RECOMMENDATIONS:

ADD DEMAND OR ACTUAL STATUS IDENTIFICATION TO ALL CONTROLLER INDICATORS ON THE MAIN CONTROL BOARD.

Indicators that are demand should be marked demand across the board. If not, demand then operator will assume reading is actual. ^{marked}


ESSEX HUMAN FACTORS PROJECT MANAGER

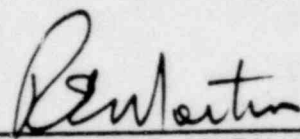

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

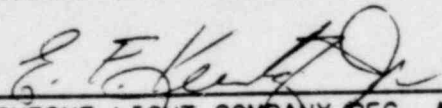

WESTINGHOUSE PROGRAM COORDINATOR

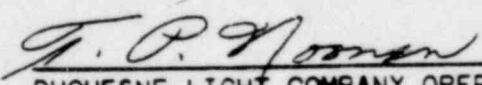
1) REVIEW AND DISPOSITION:

All Hagan are "demand"; Operators are specifically trained in this. No Action

Reject.

 10-1-85
DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 7-15-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

ATTACHMENT TO HED FORM IDENTIFICATION
OF CONTROLLER DEMAND OR ACTUAL STATUS

<u>ITEM</u>	<u>MARK NO.</u>
PRESSURIZER SPRAY VALVES	2 RCS-PCV455A, B
RHS SYSTEM OPERATION FLOW	{ 2 RHS * FCV605A, B
CONTROL VALVES	{ 2 RHS * HCV758A, B
CHARGING LINE FLOW CONTROL VALVE	2 CHS-FCV122
RCP SEAL INJECTION SUPPLY VALVE	HCV186
RESIDUAL HEAT RELEASE VALVE	2 SVS * HCV104
PRESSURIZER PRESSURE CONTROL	2 RCS-PK444A
EXCESS LETDOWN FLOW CONTROL VALVE	2 CHS * HCV137
CONDENSER STEAM DUMP CONTROLLER	2 MSS-PK464
AUXILIARY FEEDWATER FLOW CONTROL	{ 2 FWE * HCV100A, B,
VALVES	{ C, D, E, F

CLARIFICATION OF HED NO. 2***-3101

AT PRESENT THERE ARE FOUR CONTROL STATIONS ON THE MAIN CONTROL BOARD WHICH INDICATE "ACTUAL" VALVE POSITION RATHER THAN "DEMAND" VALVE POSITION. THESE ARE 2RCS#HIC250A&B (REACTOR HEAD VENT FLOW CONTROL) AND 2SIS#HIC868A&B (SI THROTTLING).

THE FOUR CONTROLLERS LISTED ABOVE ARE MARKED "OUTPUT FEEDBACK" ON THE CONTROLLER INDICATORS. THE EXISTING LABELLING ON THE CONTROLLER SHOULD BE SUFFICIENT. AGREE NO ACTION REQUIRED.

D. Sykes 9-16-85

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: J. Downing

c) HED NO.: 2PAX-3201

d) REVIEWED BY: W. J. Catullo Jr.
(Westinghouse)

e) DATE: 7/31/84

[Signature]
(Essex)

f) HED TITLE: Chipped Control Handle Surfaces

g) ITEMS INVOLVED:

Discrete Rotary, CIA Actuation - (793), Pnl BA1
Discrete Rotary, Man Act, SI SIG - (892), Pnl BA2
Discrete Rotary, Rear Trip, 1-DASBJ (645), Pnl BA3

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

Control surfaces broken, chipped, or crumbled.
6.4.1.1e.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Controls Survey
TP4.1B3.6


DLCIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

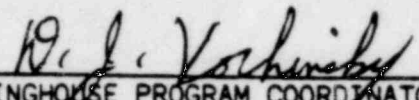
Handles prone to chipping damage.

k) REVIEW AND RECOMMENDATIONS:

- Use a protective, non-slip coating on control panel surface to protect paint
- THESE ARE THE RED OVAL HANDLED SWITCHES
 - RECOMMEND RE-PAINTING OR RE-COATING THOSE THAT ARE CHIPPED.


ESSEX HUMAN FACTORS PROJECT MANAGER

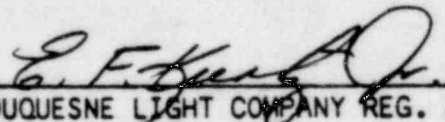

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

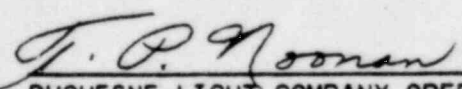

WESTINGHOUSE PROGRAM COORDINATOR

l) REVIEW AND DISPOSITION:

Agree that when handles become chipped to infringe the red color that they be re-painted, no action at this time


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS/Unit 2
PLANT/UNIT

b) ORIGINATOR: Jacki Downing c) HED NO.: 2BC2-3202

d) REVIEWED BY: W. J. Catullo Jr. e) DATE: 7/31/84
(Westinghouse)

T. J. Vora
(Essex)

f) HED TITLE: Key switches with single row of teeth
not oriented so that teeth point upward

g) ITEMS INVOLVED:

Key switches, on EHC Panel - (144), PNL BC2

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

Keys with single rows of teeth for key switches should be inserted into locks with teeth pointing up or forward. 6.4.4.3b. One key switch appears to be oriented downward while the other is oriented upward.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER: Controls Survey TP4.1B3.22

DLCIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

A delay in activation of control could occur due to the different orientation for each keyswitch.

k) REVIEW AND RECOMMENDATIONS:

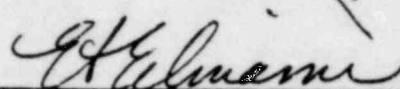
All keyswitches should be modified to an upward orientation for the teeth of the key.

• THESE-KEY SWITCHES ARE NOT CRITICAL TO SAFETY AND OPERATOR WOULD NOT BE PUSHED TO INSERT & TURN KEY.

• NO ACTION RECOMMENDED



ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER



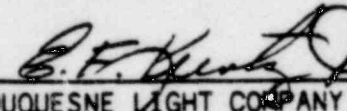
WESTINGHOUSE PROGRAM COORDINATOR

l) REVIEW AND DISPOSITION:

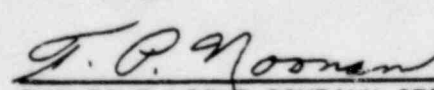
No Action



DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 6-21-85

DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER



DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS/Unit 2
PLANT/UNIT

b) ORIGINATOR: Jacki Downing c) HED NO.: 2BC2-3203

d) REVIEWED BY: W. P. Catullo e) DATE: 7/31/84
(Westinghouse)

T. J. Voss
(Essex)

f) HED TITLE: Key-operated bck not oriented so that switch in "off" or "safe" when key is vertical.

g) ITEMS INVOLVED:
Key switches, on EHC Control Panel - (144) - Pnl BC2

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

Key-operated bcks should be oriented so that the switch is "off" or "safe" when the key is in the vertical position. 6.4.4.3d

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Controls Survey
TP4.1B3.23

DLCIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

May result in delay in activation or an incorrect control movement.

k) REVIEW AND RECOMMENDATIONS:

Modify orientation of key switch to include a vertical position for the OFF or SAFE Mode.

"OFF" IS TO THE LEFT WHICH IS CONSISTENT WITH PLANT CONVENTION. LABELING IS READABLE. LIKELIHOOD OF ERROR IS VERY LOW.

• No ACTION RECOMMENDED.



ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER



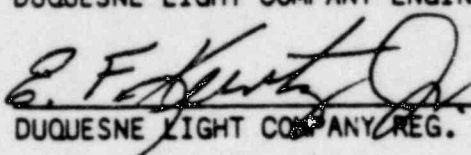
WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

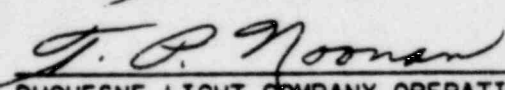
No Action



DUQUESNE LIGHT COMPANY ENGINEERING MANAGER



DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER



DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BURS/2
PLANT/UNIT

b) ORIGINATOR: J. Goodson

c) HED NO.: 2BXX-3204

d) REVIEWED BY: *W. J. Petulla Jr.*
(Westinghouse)

e) DATE: 10/16/84

[Signature]
(Essex)

f) HED TITLE: Control position information not visible to the
operator during operation.

g) ITEMS INVOLVED:

All black egg-shaped handles on benchboards.

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER: 6.6.3.8, C.

Control position information is obscured by egg-shaped handles during operation of the controls.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Control room survey, Labels and location aids

TPG.1 A-8

DLCIN R403


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

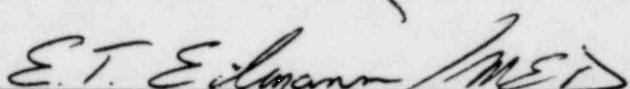
Operator errors could result, especially activation of wrong control.

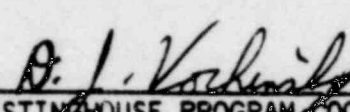
k) REVIEW AND RECOMMENDATIONS:

Replace egg-shaped handles with J-handles.

Unit 2 is under repair. No action required!


ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

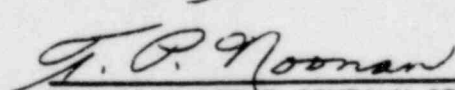

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

No Action


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 6-21-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

e) BVPS-2
PLANT/UNIT

b) ORIGINATOR: Jacki Downing c) HED NO.: 2BC2-3401

d) REVIEWED BY: M. J. Catullo Jr. e) DATE: 7/31/84
(Westinghouse)

[Signature]
(Essex)

f) HED TITLE: More than three lines of lettering
appear on legend buttons.

g) ITEMS INVOLVED: Legend buttons on turbine EH control panel (144) (Buttons located within "valve test left" and "valve test right" on the turbine control panel.) Panel BC-2.

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:
Messages on legend push buttons contain more than three lines of lettering. 6.4.3.3b(s)

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

Controls Survey - TP 4.1 B3.17 DLGIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

Can result in a delay in activation of the control.

k) REVIEW AND RECOMMENDATIONS:

Reduce the number of lines on the legend buttons by using abbreviations or more specific or concise language.

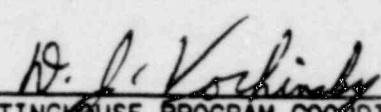
- BUTTONS ARE DIVIDED IN HALF, TWO INDEPENDENT MESSAGES WITH ONLY ONE HALF LIT AT A TIME.
- MESSAGES ARE EASY TO READ.
- NO ACTION RECOMMENDED.



ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER



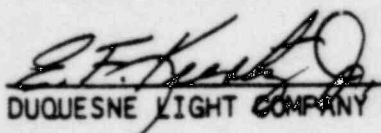
WESTINGHOUSE PROGRAM COORDINATOR

l) REVIEW AND DISPOSITION:

No Action



DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 6-21-85

DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER



DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS/Unit 2
PLANT/UNIT

b) ORIGINATOR: Jacki Downing c) HED NO.: 2BC2-3403

d) REVIEWED BY: W. J. Catullo Jr. e) DATE: 7/31/84
(Westinghouse)

T. Wors
(Essex)

f) HED TITLE: Contiguous push buttons have
no barriers.

g) ITEMS INVOLVED: Contiguous push button arrays,
on EHC Panel - (144) - Pnl BC2

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:
Barriers are not used when legend push buttons
are contiguous. 64.3.3d (1).

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

Controls Survey
TP4.1B3.18

DLCIN 13403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

May result in accidental activation of
contiguous pushbuttons.

k) REVIEW AND RECOMMENDATIONS:

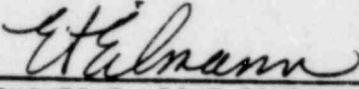
Pushbutton panel could be modified to reduce runners between contiguous pushbuttons.

Detent force could be increased to reduce the possibility of accidental activation.


- Buttons are separated by $5/32$ " and are large enough that accidental activation is very unlikely.
- No Action Recommended.



ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER




WESTINGHOUSE PROGRAM COORDINATOR

l) REVIEW AND DISPOSITION:

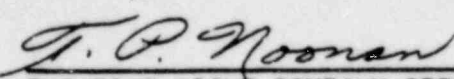
No Action



DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 6-21-85

DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER



DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: MADELINE RYABY

c) HED NO.: 2VC⁷-340⁴

d) REVIEWED BY: W. J. Catullo Jr.
(Westinghouse)

e) DATE: OCT. 12, 1984

T. [Signature]
(Essex)

f) HED TITLE: BARRIER WIDTH OF CONTIGUOUS LEGEND PUSHBUTTONS
DOES NOT MEET MINIMUM (0.125") STANDARDS.

g) ITEMS INVOLVED:

BARRIERS ON CONTIGUOUS LEGEND PUSHBUTTONS ON PANELS;
VC⁷

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

BARRIER WIDTH MEASUREMENTS FALL BELOW MINIMUM
ACCEPTABLE STANDARDS OF 0.125",
6.4.3.3e (3)

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

CONTROLS SURVEY TP 4.1 B.1.1 1.7 DLCIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:


BARRIER WIDTH NOT WIDE ENOUGH TO PROVIDE OBVIOUS
DEFINITION BETWEEN ADJACENT PUSHBUTTONS, MAY
RESULT IN ACCIDENTAL ACTIVATION OF CONTIGUOUS
PUSHBUTTONS.

k) REVIEW AND RECOMMENDATIONS:


WIDTH OF BARRIERS BETWEEN PUSHBUTTONS SHOULD BE INCREASED TO MEET O700 STANDARDS

• HED IS INCORRECT, BARRIERS ($5/32$ ") ARE ACTUALLY LARGER THAN REQUIRED.

• NO ACTION

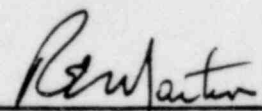

ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

No Action


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 6-21-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT


- a) BVPS 2
PLANT/UNIT
- b) ORIGINATOR: - N. K. DOOLEY c) HED NO.: 2BC2-3405
- d) REVIEWED BY: [Signature] e) DATE: 7/31/84
(Westinghouse)
- [Signature]
(Essex)
- f) HED TITLE: INCONSISTENCY OF COLOR CODING WITHIN SYSTEMS.
-
- g) ITEMS INVOLVED: HEATER CONTROL SYSTEM (HE 250)
PML BC2 (117)
- h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:
COLORS INCONSISTENT WITHIN SYSTEM; GREEN AND RED IN
REVERSED POSITIONS ON DIFFERENT PUSH BUTTONS WITHIN THE SYSTEM.
651.6 ds.
- i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER: CONVENTIONS SURVEY TP8.137.9 DLCIN R403
- j) SPECIFIC HUMAN ERROR(S) OR EQUIPMENT DESIGN PROBLEM:
MAY CAUSE DELAYS AND/OR ERRORS IN OPERATOR RESPONSES.

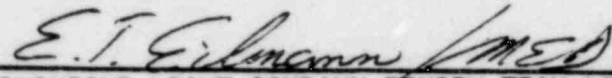
k) REVIEW AND RECOMMENDATIONS:

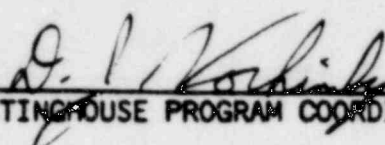
REPOSITION - REFERRED TO BATHROOM. CONSISTENCY IN COLOR CODING.

- The one that is reversed is not a valve position. All valve position pushbuttons are consistent.

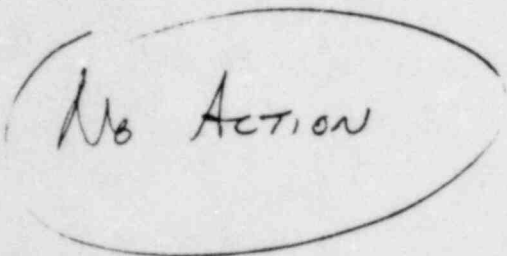
NO ACTION


ESSEX HUMAN FACTORS PROJECT MANAGER

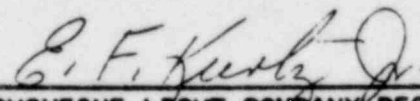

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

l) REVIEW AND DISPOSITION:


No Action

 11-15-85
DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 11-15-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER

 11-15-85
DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BVPS-2
PLANT/UNIT

b) ORIGINATOR: MADELINE QYABY c) HED NO.: 2BC2-3901

d) REVIEWED BY: *M. J. Catullo*
(Westinghouse) e) DATE: OCT. 11, 1984

T. [Signature]
(Essex)

f) HED TITLE: KEY OPERATED CONTROL DISPLACEMENT LESS THAN
80° MINIMUM STANDARD.

g) ITEMS INVOLVED:
KEY OPERATED SWITCH ON EHC Panel, PNL BC2

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:
KEY OPERATED SWITCH DISPLACEMENT IS LESS THAN 80° MINIMUM
STANDARD. DISPLACEMENT MEASURED AT 60°.
6.4.4.3.g (1)


i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

Controls Survey TP 4.1 B1.1 1.3 DLGIN R403

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:
FAILURE TO RECOGNIZE SWITCH POSITION.

k) REVIEW AND RECOMMENDATIONS:

- Increase displacement to 0700 minimum standards (80°).
- CONTROL POSITIONS ARE CLEARLY LABELED AND DISCRIMINABLE.
- DEGREE OF ROTATION (60°) IS SUFFICIENT TO IDENTIFY SWITCH POSITION - AND MOVEMENT.
- NO ACTION RECOMMENDED


ESSEX HUMAN FACTORS PROJECT MANAGER


DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

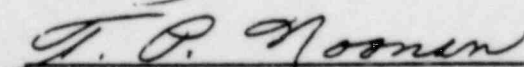

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

No Action


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BUPS-2
PLANT/UNIT

b) ORIGINATOR: N. KFOURY

c) HED NO.: 244-4001

d) REVIEWED BY: H. J. Catlett
(Westinghouse)

e) DATE: 11/8/84

T. J. Vora
(Essex)

f) HED TITLE: NITROGEN PURGE REMOVED

g) ITEMS INVOLVED:

1- GN-3 NITROGEN PURGE TO C STEAM GENERATOR

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

NITROGEN PURGE TO C STEAM GENERATOR WAS REMOVED,
RESULTING IN UNISOLVED PATH TO OUTSIDE ATMOSPHERE.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER: LER 280-93015 LER Review DLC IN 401A

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

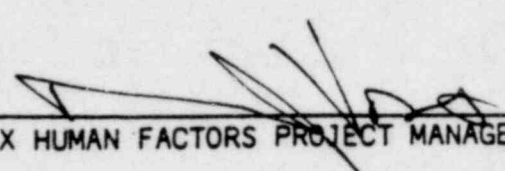
OPERATOR WAS NOT AWARE OF PLANT CONDITIONS BEFORE MOVING FUEL

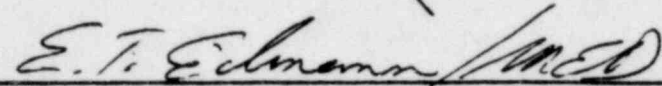
k) REVIEW AND RECOMMENDATIONS:

INITIATE PROCEDURE TO ENSURE OPERATOR KNOWLEDGE OF PLANT CONDITIONS
BEFORE MOVING FUEL.

By Procedure, all operators are required to log all
abnormal plant conditions, regardless of mode.

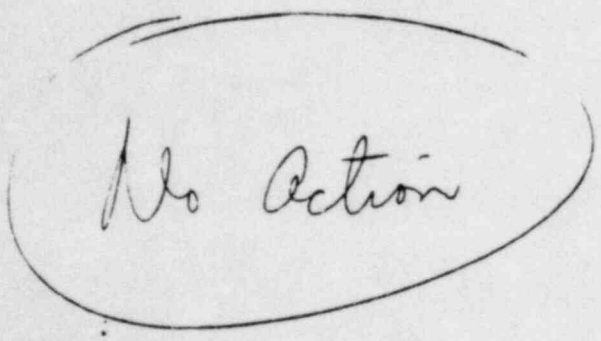
no action

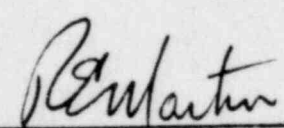

ESSEX HUMAN FACTORS PROJECT MANAGER

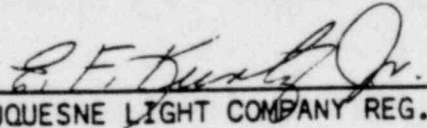

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

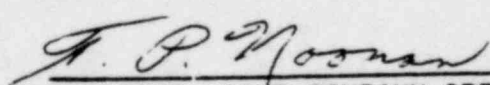

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:


No Action

 11-15-85
DUQUESNE LIGHT COMPANY ENGINEERING MANAGER

 11-15-85
DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER

 11-15-85
DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BUPS - 2
PLANT/UNIT

b) ORIGINATOR: N. KFOLEY c) HED NO.: 2***-4002

d) REVIEWED BY: M. J. Catello
(Westinghouse) e) DATE: 11/8/84

T. Woods
(Essex)

f) HED TITLE: CONTAINMENT BULK AVERAGE TEMPERATURE NOT WITHIN T.S. LIMITS

g) ITEMS INVOLVED:

INCORRECT VALVE LINEUP ON UNIT #2 CHILLED WATER CHILLER CONDENSER

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

THE CONTAINMENT BULK AVERAGE TEMPERATURE EXCEEDED THE T.S. LIMIT OF 105°F FOR APPROXIMATELY 2.5 HOURS. CONSEQUENCES WERE LIMITED DUE TO AVAILABILITY OF UNIT #2 CHILLED WATER SYSTEM TO PROVIDE COOLING WATER FOR THE CONTAINMENT COOLING SYSTEM. AN INCORRECT VALVE LINEUP ON UNIT #2 CHILLED WATER CHILLER CONDENSER CAUSED THE CONDENSER TO FLOOD OUT.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER:

LER 338-78081

LER Review DLCIN R401A

j) SPECIFIC HUMAN ERROR(S) OR EQUIPMENT DESIGN PROBLEM:

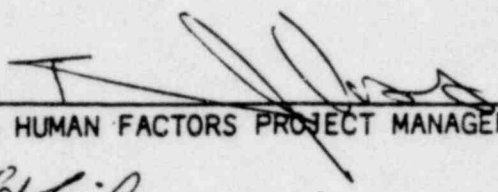
OPERATOR ERROR RESULTING IN INCORRECT VALVE LINEUP.

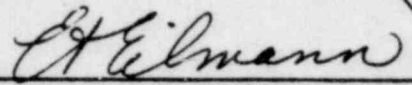
k) REVIEW AND RECOMMENDATIONS:

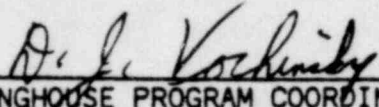
RE-EVALUATE PROCEDURE FOR VALVE LINEUP ON UNIT #2 (CHILLED WATER CHILL CONDENSER) FOR IMPROVEMENT IN CLARIFICATION OF STEPS IN PROCEDURE.

• MAKE SURE PROCEDURE IS CLEAR.

ok

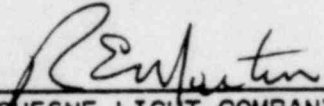

ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER

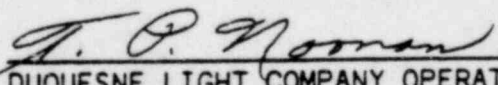

WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Agree - No action in DECOR Scope


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BUPS-2
PLANT/UNIT

b) ORIGINATOR: N. K. FOLEY

c) HED NO.: 2444-4003

d) REVIEWED BY: N. F. Catallo
(Westinghouse)

e) DATE: 11/8/84

[Signature]
(Essex)

f) HED TITLE: POST ACCIDENT MONITORING HYDROGEN ANALYZER FAILURE

g) ITEMS INVOLVED:

PAM HYDROGEN ANALYZER

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

PAM HYDROGEN ANALYZER FAILED DUE TO LOW LEVEL BACK PRESSURE
IN SAMPLE LINES.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION
NUMBER:

LER 338-80058

LER Review DLC IN R401A


j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

PROCEDURE PROBLEM

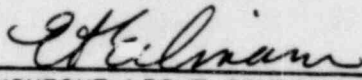
k) REVIEW AND RECOMMENDATIONS:

REVIEW PROCEDURE STEPS TO DETERMINE IF IMPROVEMENTS COULD BE MADE

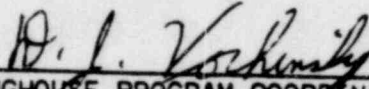
ok



ESSEX HUMAN FACTORS PROJECT MANAGER



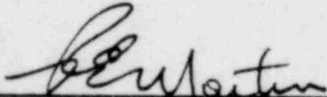
DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER



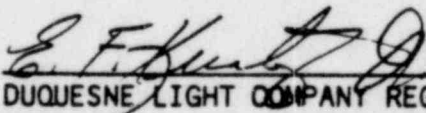
WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

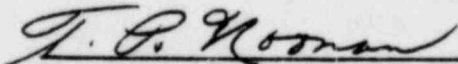
Agree - Not C.R.R.



DUQUESNE LIGHT COMPANY ENGINEERING MANAGER



DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER



DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BuPS - 2
PLANT/UNIT

2***-4201

b) ORIGINATOR: N. K. DUEY

c) HED NO.: [REDACTED]

d) REVIEWED BY: [Signature]
(Westinghouse)

e) DATE: 11/7/84

[Signature]
(Essex)

f) HED TITLE: INCORRECT VALVE OPENING RESULTING IN INADVERTENT RELEASE OF LIQUID WASTE TEST TANK.

g) ITEMS INVOLVED:

DISCHARGE VALVE FOR LIQUID WASTE TANK

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

LIQUID WASTE TANK WAS INADVERTENTLY RELEASED WITHOUT BEING SAMPLED AND VERIFIED TO BE WITHIN LIMITS. OPERATOR OPENED THE WRONG DISCHARGE VALVE WHILE PREPARING TO RELEASE ANOTHER LIQUID WASTE TANK WHICH HAD BEEN SAMPLED.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER: LER REVIEW

LER 280-80016

DLCIN R401A

j) SPECIFIC HUMAN ERRORS(s) OR EQUIPMENT DESIGN PROBLEM:

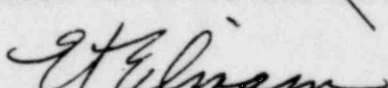
OPERATOR MANIPULATED THE WRONG VALVE [ERROR OF COMMISSION]

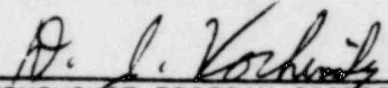
k) REVIEW AND RECOMMENDATIONS:

REVIEWER'S COMMENTS
REVIEWER'S COMMENTS TO INCREASE EFFECTIVENESS OF THE REVIEW
VERIFY: CORRECT CONTROL OPERATION

- ALSO, PROPER USE OF CHECK-OFF LIST WILL HELP TO AVOID THIS EVENT.

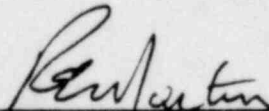

ESSEX HUMAN FACTORS PROJECT MANAGER

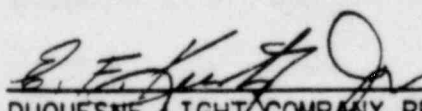

DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER


WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

Agree - Not CRDL


DUQUESNE LIGHT COMPANY ENGINEERING MANAGER


DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER


DUQUESNE LIGHT COMPANY OPERATIONS MANAGER

HUMAN ENGINEERING DISCREPANCY (HED) REPORT

a) BUPS-2
PLANT/UNIT

b) ORIGINATOR: N. KFWRY c) HED NO.: 2***-4202

d) REVIEWED BY: *N. J. Catella*
(Westinghouse) e) DATE: 11/8/84

[Signature]
(Essex)

f) HED TITLE: ERRONEOUS PRESSURIZER LEVEL TRANSMITTER READINGS

g) ITEMS INVOLVED:
PRESSURE LEVEL TRANSMITTER LI-1461

h) PROBLEM DESCRIPTION AND 0700 PARAGRAPH NUMBER:

PRESSURE LEVEL TRANSMITTER LI-1461 WAS OBSERVED TO BE READING MORE THAN 35% ABOVE THE AVERAGE READING THE SITUATION EXISTED FOR 14 HOURS, WHICH WAS DISCOVERED AFTER CHECKING THE LOG BOOKS. THE PRESSURIZER LEVEL TRANSMITTER FAILED HIGH DUE TO A FAILURE IN THE TEMPERATURE COMPENSATOR ON THE DIFFERENTIAL PRESSURE UNIT.

i) DATA COLLECTION DESCRIPTION AND DUQUESNE LIGHT COMPANY INSTRUCTION NUMBER: LER 338-80083 LER REVIEW DLC IN R401A

j) SPECIFIC HUMAN ERRORS(S) OR EQUIPMENT DESIGN PROBLEM:

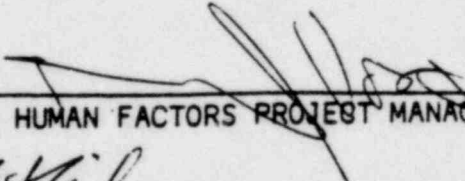
LOG BOOK NOT CHECKED CAREFULLY [ERROR OF OMISSION] OPERATOR ERROR FAILURE IN THE TEMPERATURE COMPENSATOR ON THE DIFFERENTIAL PRESSURE UNIT. EQUIPMENT DESIGN PROBLEM.

k) REVIEW AND RECOMMENDATIONS:


REINSTRUCT OPERATORS TO PERUSE THE LOG BOOK MORE CAREFULLY.
TRANSMITTER, BELLOWS AND CAPILLARY WERE REPLACED. AS A RESULT
OF THIS LER.

- BV-2 HAS ADMINISTRATIVE CONTROLS TO ENSURE
OPERATORS EXAMINE LOG BOOKS AT START OF
SHIFT.

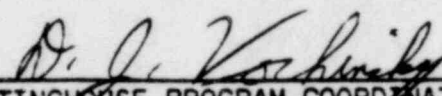
NO ACTION



ESSEX HUMAN FACTORS PROJECT MANAGER



DUQUESNE LIGHT COMPANY REVIEW TEAM LEADER




WESTINGHOUSE PROGRAM COORDINATOR

1) REVIEW AND DISPOSITION:

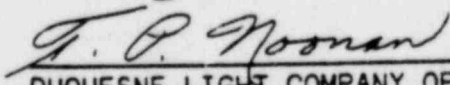
No Action



DUQUESNE LIGHT COMPANY ENGINEERING MANAGER



DUQUESNE LIGHT COMPANY REG. AFFAIRS MANAGER



DUQUESNE LIGHT COMPANY OPERATIONS MANAGER