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RECIP.NAME RECIPIENT AFFILIATION
TEDESCO,R.L. Assistant Director for Licensing

SUBJECT: Forwards commitment to perform control room human factors upgrade based on 810908 walkthrough findings & 810814 design review.

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	HYD/GEO BR 30	2	2	I&C SYS BR 16	1	1
	I&E 06	3	3	IE/EPDB 35	1	1
	IE/EPLB 36	3	3	LIC GUID BR 33	1	1
	LIC QUAL BR 32	1	1	MATL ENG BR 17	1	1
	MECH ENG BR 18	1	1	MPA	1	0
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ARIZONA PUBLIC SERVICE COMPANY
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P.O. BOX 21666 - PHOENIX, ARIZONA 85036

October 5, 1981
ANPP-19099-JMA/ECS

Mr. R. L. Tedesco
Assistant Director for Licensing
Division of Licensing
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Palo Verde Nuclear Generating Station (PVNGS) Units 1, 2 and 3
Docket Nos. STN-50-528/529/530
File: 81-056-026; G.1.10

References: (1) ANPP-18654, E. E. Van Brunt, Jr. to R. L. Tedesco dated August 14, 1981
(2) NRC memo from Ann Ramey-Smith to Janis Kerrigan dated September 8, 1981, subject: Palo Verde Control Room Review Team Members

Dear Mr. Tedesco:

Attached is our commitment to perform the control room human factors upgrade based on the Reference 2 walkthrough findings on our Reference 1 Control Room Design Review.

If you have any questions, please contact Ed Sterling on (602) 271-7280.

Very truly yours,

E. E. Van Brunt

E. E. Van Brunt, Jr.
APS Vice President,
Nuclear Projects
ANPP Project Director

EEVBJr/ECS/av
Attachment
cc: J. Kerrigan (w/a)
P. Hourihan "
A. C. Gehr "
R. Ramirez "

B001
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1/1

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

I, Edwin E. Van Brunt, Jr., represent that I am Vice President Nuclear Projects of Arizona Public Service Company, that the foregoing document has been signed by me on behalf of Arizona Public Service Company with full authority so to do, that I have read such document and know its contents, and that to the best of my knowledge and belief, the statements made therein are true.

Edwin E. Van Brunt Jr.
Edwin E. Van Brunt, Jr.

Sworn to before me this 5th day of October, 1981.

Connie Lu Armstrong
Notary Public

My Commission expires:

June 24, 1983

RESOLUTION OF CRDR COMMENTS

1. The Category A HED's will be implemented as indicated on Attachment A prior to fuel loading. HED #80 was indicated by the NRC in the walk-through as no discrepancy; we will re-review this HED and implement as appropriate prior to fuel load.

2. The Category B HED's will be implemented as indicated on Attachment B prior to fuel loading. HED #122 was indicated by the NRC in the walk-through as no discrepancy; we reviewed and agree, so there will be no change.

3. The Category C HED's shown on Attachment C, except for HED's 13, 54, 55, 69, 92, 102, and 117, will be implemented prior to fuel loading. HED's 13, 69, and 117 were indicated by the NRC in the walkthrough as no discrepancy; we will re-review these HED's and will implement as appropriate. HED 92 will be implemented at a convenient outage. HED's 54 and 55 involve reprogramming of the Plant Monitoring System. We will review effort for proper time of implementation.

4. The corrective actions for the Category C HED's is as indicated in the Executive Summary, Reference 1, except for HED's 1, 2, 3, 32, 51, 63, 97 and 98.

   a. For HED's 1, 2, 3 and 32, the original corrective action of using dual-filament lamps is not feasible. We are currently reviewing other possible fixes.

   b. For HED 51, we will evaluate the use of the data presented on the TRACOR recorders. If a distinct value is needed of a particular parameter, then its display method will be revised. Those parameters where the TRACOR presentation is suitable will not be revised.

   c. The corrective actions for HED's 63, 97 and 98 are as shown on Attachment C.

5. Category C HED 102 will remain as an open item while we evaluate with Foxboro if the problem is solvable.

6. The following Category D Checklist Discrepancies (CLD) will be implemented prior to fuel load: CLD's 4.004, 8.001, 13.005, 13.208, 13.211, 13.408 and 13.504. See Attachment D.

7. CLD's 2.026 and General 7D (Attachment E) will be implemented prior to fuel load by providing training on the proper relamping method.

8. CLD's 2.029 and 2.030 (Attachment F) will not be implemented. The operator is not using these indicators to determine discrete values of parameters. He is using them as an indication of general operating range. For this purpose, the instruments are satisfactory.

9. CLD 2.031A (Attachment G) will not be implemented. Operator not using meter to indicate a value. Indicator is properly implemented as a null meter.

10. CLD's 4.024 and 5.002 (Attachment H) will not be implemented. The control used is industry standard and the use is not critical to safety.

11. CLD 11.032 (Attachment I) will be implemented prior to fuel load if a computer compatible printer with a low noise capability can be integrated into the control room and computer system.

12. All the remaining Category D CLD's will be reviewed again with NUREG-0700 to determine if original determination is applicable or more study is necessary. We will advise the NRC of results.

13. We have received NUREG-0700. We will review it against work already performed on the human factors review of the control room and will advise the NRC of those additional tasks to be performed to meet NUREG-0700. An addendum to the Control Room Human Factors Study will be issued at the completion of these tasks.

ATTACHMENT A

TABLE 3-2A
HUMAN ENGINEERING DISCREPANCY SUMMARY
CATEGORY A
(Safety; Mandatory Implementation Prior to Fuel Loading)

HED No.	Discrepancy	Corrective Action
4	Reaching annunciators to replace lamps (B01).	Obtain stepladder for control room.
7	Units of measured parameter missing from all Foxboro displays.	Add engineering units.
15	Labels missing on "CR ESSENTIAL AHU FAN" switches (B02).	Add labels.
25	Switches too close to panel edge - accidental activation (B03, 04, 06, 07).	Install switch protection devices (e.g., guard rail) or change knobs.
29	Inadequate indication of safety systems status (SIAS, MSIS, CIAS, etc.) on B05.	Add master indicator panel.
30	Logic for reactor trip buttons not clear (B05).	Add mimic.
66	Label not readable for CWP/ Bypass switch (B04).	Change to white letters on red background.
74	Wrong label color on "HOT LEG INJECTION B FLOW" (B02).	Change to green label.
76	Inconsistent terminology between SESS and board item labels (B02).	Change labels.
77	High Press Safety Injection Flow indication confusing on loss of one train (B02).	Flow indicator redundancy under study.
79	Mimic missing on CVCS items used during LOP (B03).	Add mimics.
80	Labels on CVCS charging pumps imply incorrect operation (B03).	Change labels.

TABLE 3-2A (Continued)

HED No.	Discrepancy	Corrective Action
81	Annunciator legend incorrect for T-AVE and T-REF temperature deviation and for RC SYS TRBL (B04).	Correct window legend.
84	Missing labels on RAS ACTIVATION controls (B05).	Add labels.
86	Lacking adequate switch guards on reactor trip buttons (B05).	Change to deep-ring type button.
89	Inadequate SG level indication during manual auxiliary and main feedwater control (B06).	Add wide-range level indicators.
104	Obscured label viewing on Foxboro displays on most vertical panels.	Relocate labels.
108	Wrong location and lack of valve position indication on jog-open valves.	Relocate and add position indicators.
112	Lacking demarcation of all major systems on most boards.	Demark affected control boards.
118	Annunciator System has several deficiencies.	Initiate study to determine corrections.

ATTACHMENT B

TABLE 3-2B
HUMAN ENGINEERING DISCREPANCY SUMMARY
CATEGORY B
(Reliability - 90% Availability Criterion;
Mandatory Implementation Prior to Fuel Loading)

HED No.	Discrepancy	Corrective Action
11	Labels missing on Electric Mimic Bus (B01).	Add labels.
17	Lacking wide-range pressure and level indication near pressurizer controls (B03).	Add wide-range indicator.
35	Incorrect color of ON/Off buttons on Generex panels (B06).	Change pushbuttons to correct color.
40	Labels missing and non-descriptive on FW & SR Systems Board (B06).	Add and correct labels.
45	Lacking main generator trip alarms near controls (B06).	Move alarms to near controls.
46	Labels missing on MSR switches (B06).	Add labels.
59	One key-operated switch requires teeth pointing up (B03).	Orient switch for teeth pointing down.
60	Missing NORMAL label on some key-operated switches.	Add label.
67	Lacking phone Coverage on some panels.	Study effect of longer cords on simulator.
68	Control room floor is hard.	Install carpet.
70	Diesel generator synchroscopes ~9 feet from controls (B01).	Add synchroscopes near controls.
71	Wrong label on diesel generator Start/Stop switch (B01).	Change label.
83	SG level scales are 0-100% for both narrow and wide range indicators (B05).	Change scales to Engineering Units.

TABLE 3-2B (Continued)

HED No.	Discrepancy	Corrective Action
87	PPS relay status lights are wrong color (B05).	Change to blue lens.
88	PPS controls illuminated when OFF (B05).	Change to black lenses due to addition of logic alarm box.
95	Condensate low vacuum alarm location not convenient (B07).	Add additional alarm.
96	Reactor coolant pump and backup heater switches are similar and closely located (B04).	Change knob on backup heater switch.
100	Specular glare on Foxboro displays from polished surfaces.	Change to matt surfaces.
101	Varying specular glare on Foxboro displays from fexible surfaces.	Change to rigid surfaces.
106	Lacking narrow range trend information on Foxboro recorders (B02).	Change to 2-speed recorders where needed.
122	Uncomfortable knob on CMC switches for jog-valves.	Review compliance and criteria for Push-to-Stop switches.

ATTACHMENT C

TABLE 3-2C
HUMAN ENGINEERING DISCREPANCY
CATEGORY C
(Reliability-Enhancement; Mandatory Implementation at Convenient Outage)

	HED No.	Discrepancy	Corrective Action
FL	1	Lack of distinction between lamp failure and status change in CMC switches.	Reviewing for suitable fix.
FL	2	Lacking lamp redundancy in CMC switches.	Reviewing for suitable fix.
FL	3	Lacking lamp test capability for CMC switches.	Reviewing for suitable fix.
FL	5	Interchange of legend screens on Electric Bus panel (B01).	Change procedure to single-legend screen removal.
D	13	Sharp edges on book stops (B02, 07).	Round all edges and corners.
FL	14	Interchange of legend screens on SESS panel (B02).	Change procedure to single-legend screen removal.
FL	20	Confusing mimic of flow to and from reactor on CVCS panel (B03).	Change mimic to clarify.
FL	21	Interchange of legend screens on CEDM panel and Reactor Power cutback system (B04).	Change procedure to single-legend screen removal.
FL	23	Wrong label on Reactor Coolant Pump 1B Start/Stop switch.	Change label.
FL	31	Lacking valve position indication on demineralizer bypass jog valve (B05).	Add valve position indicator.
FL	32	Lacking lamp redundancy on Generex panel (B06).	Reviewing for suitable fix.
FL	33	Lamp removal is from back of Generex panel (B06).	Redesign for removal from front of panel

TABLE 3-2C (Continued)

	HED No.	Discrepancy	Corrective Action
FL	47	Inconsistent terminology on alarm window for header pressure (B06).	Change alarm window.
FL	49	High glare on Cooling Tower Fan Control panel displays (B07).	Change to matt finish displays.
FL	50	Interchange of legend screens on Cooling Tower Fan Control panel (B07).	Change procedure to single-legend screen removal.
FL	51	Typing-over of data on multipoint recorders (B07).	Review data use; revise hardware as necessary to fit data use
FL	52	Non-functional colored strips on some boards.	Remove strips.
FL	53	Glare on CRT screens.	Install CRT hoods.
FL PF	54	Missing labels on CRT data display.	Reprogram to add labels.
FL PF	55	Lacks label highlighting on CRT data display.	Reprogram to highlight labels.
FL	56	Inadequate bookshelves.	Add bookshelves.
FL	58	Lack of operator understanding of control board design.	Provide operator training.
FL	63	Lack of distinction between legend switches and backlighted displays.	Provide distinguishing markings on switches and displays.
FL	64	Specular glare from all displays on lower 2 slopes of each board.	Use matt surfaces for these displays.
FL	65	Excessive CRT brightness from room lighting (B01).	allow operator discretion on room lighting level.
D	69	Glare on SESS panel hinders light-on determination.	Change to matt surface displays.

TABLE 3-2C (Continued)

HED No.	Discrepancy	Corrective Action
72	Use of green light brightness for faulted vs. normal status on Electric Bus (B01).	Ensure a clear distinction in light brightness.
73	Inconsistent terminology between H_2 train alarms and control labels (B02).	Change alarm windows.
75	Lacking overload indications on ammeters for large pumps.	Add overload markings.
78	Non-conformance between SESS panel and control panel layouts (B02).	Change SESS panel layout.
82	Inconsistent label location for the four DNBR/LPD calculators (B05).	Relocate labels.
85	Inconsistent alarm legends for linear power density (B05).	Change window legend.
90	Inconsistent alarm legends - COND vs. CNDS on B06.	Change legend to correct terminology.
91	Inconsistent terminology between alarms and controls for generator seal oils (B06).	Change alarm window legend.
92	Large size of Power Factor meters not consistent with importance. (B06).	Change to smaller MEGAVAR meters.
93	Inconsistent mode select sequence of MSR switches (B06).	Change mode select lineup.
94	PMS trouble alarm location not convenient (B04).	Move alarm to B01.
97	Interference of Control Knobs at lower board slope change (B07).	Move knobs.

TABLE 3-2C (Continued)

	HED No.	Discrepancy	Corrective Action
FL FIX OVERD	98	Glare on switch surfaces hinders light-on determination.	Change to matt surfaces or evaluate ambient lighting levels
OPER	102	Moving scales in Foxboro displays.	Change procedures to preclude movement by operators.
FL	103	Low light intensity on scales of Foxboro controllers.	Change to lighter colored filters.
FL	105	Over-similarity in appearance of the 5 types of Foxboro controllers/displays.	Color code facing.
FL	109	Wrong label for alarm acknowledge button on Radiation Monitor Terminal.	Change label.
FL	111	Lacking parameter units on Foxboro recorders.	Use pre-printed paper.
FL	113	Uncomfortable key size on key-switches for jog-valves.	Change to larger keys.
FL	114	More than 3 lines of text on several legends and indicators.	Reduce text where possible.
FL	115	Missing mimics on Electric Mimic Bus (B01).	Add mimics.
FL	116	Wrong colored lights on CPC mode indicators.	Change lenses.
D	117	Unnecessary location of Generator Ground Voltmeter on B06.	Move to miscellaneous cabinet.

ATTACHMENT D

(1)

CHECKLIST DISCREPANCY

PLANT PVNGS	J. K. Lonigro EVALUATOR	HED # NA
SUBTASK Human Factors	J. K. Lonigro SIGNATURE	CLD # 4.004
CL # 4 CL ITEM # 55		DATE 12/5/80

CL TITLE Controls CLD CATEGORY ~~B~~ D

PANEL TITLE Electric Mimic Bus PANEL # B-01

CLD DESCRIPTION

All keys for key-operated-switches are inserted with the teeth pointing down.

☐ SUPPORT MATERIAL ATTACHED

POTENTIAL OPERATOR ERROR(S)

Response time lengthened.

RECOMMENDED REVISION

~~Reverse tumblers to accommodate keys with teeth pointing up.~~

Consistant with HED 59

RECOMMENDED IMPLEMENTATION:

☐ PRIOR TO FUEL LOADING

☐ PRIOR TO PLANT OPERATIONS > 5% POWER

☐ AT A CONVENIENT PLANT SHUTDOWN

ATTACHMENT D
(2)

CHECKLIST DISCREPANCY

PLANT PVNGS	J. K. Lonigro EVALUATOR J. K. Lonigro SIGNATURE	HED # NA
SUBTASK Human Factors		CLD # 8.001
CL # 8 CL ITEM # 22		DATE 1/13/81
CL TITLE Communications	CLD CATEGORY ~~B~~ D	
PANEL TITLE All with phones	PANEL #	

CLD DESCRIPTION

There is a potential problem with the panel phone cords becoming entangled around critical controls. However, an operator would probably not be capable of applying enough force to activate any controls.

☐ SUPPORT MATERIAL ATTACHED

POTENTIAL OPERATOR ERROR(S)

Accidental activation of controls.

RECOMMENDED REVISION

~~None~~ Consistant with HED 67

RECOMMENDED IMPLEMENTATION:

☐ PRIOR TO FUEL LOADING
☐ PRIOR TO PLANT OPERATIONS > 5% POWER
☐ AT A CONVENIENT PLANT SHUTDOWN

ATTACHMENT D

(3)

CHECKLIST DISCREPANCY

Rev. 2/11/81

PLANT: Palo Verde	T. Spurgin EVALUATOR T. Spurgin SIGNATURE	HED #: NA 107
SUBTASK: Systems Factors		CLD #: 13.005
CL #: 13 CL ITEM #: 18		DATE: 01-23-81
CL TITLE: Systems Factors, CL 13	CLD CATEGORY: 2 B D	
PANEL TITLE: A11		PANEL #: A11

CLD DESCRIPTION

Foxboro Equipment

Recorders are marginally adequate for recording and monitoring purposes but inadequate for control purposes because of position of pens and readability. See Fig. 13.005. The chart records are difficult to access, exposed chart in normal position is limited and inadequate for operations such as start-up. Chart exposed to view is small leading to slow recorder speeds for long record time so that details are lost.

(Note, Operators liked the Honeywell recorder on B06)

☒ SUPPORT MATERIAL ATTACHED

POTENTIAL OPERATOR ERROR(S)

A. Operator mistrust of these instruments could result in reduced effectiveness and increased time of response to any given situation.

B. Charts difficult to impossible to use for control processes and can lead to operation actions which could lead to plant trip.

RECOMMENDED REVISION

Engineering should review the application of each recorder on the control boards. The application of recorders for controls purposes are different than just data logging purposes (see criteria below). The manufacturer should be informed of the discrepancy, he may have a easily implementable fix. Engineering should evaluate the use of the digitally driven recorders for control purposes (these recorded are on B04, 06 and 07). R

Criteria for trending of information for controls purposes. If a recorder is used for control purposes the operator shall be able to see clearly and immediately how the affected parameter changes. The operator shall be able to change the speed of the recorder, so that the characteristics of the response of the process to control inputs shall be clearly seen. The effects of rapidly responding changes and slowly changing variations can be made more apparent by changing chart speeds.

RECOMMENDED IMPLEMENTATION:

☐ PRIOR TO FUEL LOADING

☐ PRIOR TO PLANT OPERATIONS > 5% POWER

☐ AT A CONVENIENT PLANT [illegible]

ATTACHMENT D (4)

CHECKLIST DISCREPANCY

Rev. 2/11/81

PLANT Palo Verde	T. Spurgin EVALUATOR	HED # NA
SUBTASK Systems Factors	T. Spurgin SIGNATURE	CLD # 13.208
CL # 13 CL ITEM # 21		DATE 01-23-81

CL TITLE Systems Factors CL 13 CLD CATEGORY B & D ~~(E)~~ R

PANEL TITLE Engineered Safety Features PANEL # B02

CLD DESCRIPTION

Improper label -- tag on TT 351X should read "HX inlet temp from LPSI pump" in place of "LPSI pump discharge to HX."

☐ SUPPORT MATERIAL ATTACHED

POTENTIAL OPERATOR ERROR(S)

Can lead to operator confusion and delays in taking Operator action.

RECOMMENDED REVISION

Change tag name

RECOMMENDED IMPLEMENTATION:

☐ PRIOR TO FUEL LOADING
☐ PRIOR TO PLANT OPERATIONS > 5% POWER
☐ AT A CONVENIENT PLANT SHUTDOWN

ATTACHMENT D
(5)

CHECKLIST DISCREPANCY

Rev.2/11/81

PLANT Palo Verde	T. Spurgin EVALUATOR A. Spurgin SIGNATURE	HED # ~~NS~~ NA
SUBTASK Systems Factors		CLD # 13.211
CL # 13 CL ITEM # ~~#~~ 23		DATE 01-23-81
CL TITLE Systems Factors CL 13	CLD CATEGORY A ~~C~~ D	~~(E)~~ R
PANEL TITLE Engineered Safety Features	PANEL # B02	

CLD DESCRIPTION

The unpleasant sound of the SESS system alarm.

☐ SUPPORT MATERIAL ATTACHED

POTENTIAL OPERATOR ERROR(S)

Contributes to operator resentment of the system therefore reduced effectiveness. In the extreme the operator may acknowledge without proper checks.

RECOMMENDED REVISION

Change to a more acceptable sound. ~~HF experts could advise~~. Will factor into alarm prioritization study.

RECOMMENDED IMPLEMENTATION:

☐ PRIOR TO FUEL LOADING

☐ PRIOR TO PLANT OPERATIONS > 5% POWER

ATTACHMENT D
(6)

CHECKLIST DISCREPANCY

Rev. 2/11/81

PLANT: Palo Verde	T. Spurgin EVALUATOR T. Spurgin SIGNATURE	HED # ~~27~~ NA
SUBTASK: Systems Factors		CLD # 13.408
CL # 13 CL ITEM # 1, 4		DATE 01/23/81
CL TITLE: Systems Factors, CL 13	CLD CATEGORY: B ~~C~~/D	~~(E)~~ R
PANEL TITLE: Reactor Systems		PANEL # B04

CLD DESCRIPTION

RV-Seal Drain and Pressure System not functionally related to systems on this board.

☐ SUPPORT MATERIAL ATTACHED

POTENTIAL OPERATOR ERROR(S)

Information unnecessary for operations from this board. May cause operator distraction.

RECOMMENDED REVISION

Move to B07 which contains miscellaneous instruments. Note changes resulting from TMI have lead to the recommendations that additional reactor vessel head leak-off control equipment be located on B07. as determined in demarcation study

RECOMMENDED IMPLEMENTATION:

☐ PRIOR TO FUEL LOADING

☐ PRIOR TO PLANT OPERATIONS > 5% POWER

ATTACHMENT D
(7)

CHECKLIST DISCREPANCY

Rev. 2/11/81

PLANT: Palo Verde	EVALUATOR: T. Spurgin	HED #: NA
SUBTASK: Systems Factors	SIGNATURE: T. Spurgin	CLD #: 13.504
CL #: 13 CL ITEM #: 1, 2		DATE: 01/23/81

CL TITLE: Systems Factors, CL 13 CLD CATEGORY: 2 & D (E) R

PANEL TITLE: PPS and Condensate PANEL #: B05

CLD DESCRIPTION

Poor choice of location for overboard valve switches.
Group of identical CMC switches inline.

☐ SUPPORT MATERIAL ATTACHED

POTENTIAL OPERATOR ERROR(S)

Inadvertent operation of overboard valves.

RECOMMENDED REVISION

Move location of valves on control board to distinguish between valves, as determined in demarcation study.

RECOMMENDED IMPLEMENTATION:

☐ PRIOR TO FUEL LOADING
☐ PRIOR TO PLANT OPERATIONS > 5% POWER

ATTACHMENT E
(1)

CHECKLIST DISCREPANCY

PLANT PVNGS	J. K. Lonigro EVALUATOR	HED # 34 NA
SUBTASK Human Factors	J. K. Lonigro SIGNATURE	CLD # 2.026
CL # 2 CL ITEM # 36		DATE 1/5/81
CL TITLE Visual	CLD CATEGORY K & D	
PANEL TITLE Turbine	PANEL # B-06	

CLD DESCRIPTION

Pushbutton legend switches on EHC control panel can inadvertently be depressed when reinstalling the legend cover after relamping.

☐ SUPPORT MATERIAL ATTACHED

POTENTIAL OPERATOR ERROR(S)

Accidental control activation.

RECOMMENDED REVISION

~~Suggest a method be adopted for restraining the control portion of the legend switch while the legend cover is being reinstalled.~~

Provide training on proper relamping method.

RECOMMENDED IMPLEMENTATION:

☐ PRIOR TO FUEL LOADING
☐ PRIOR TO PLANT OPERATIONS > 5% POWER
☐ AT A CONVENIENT PLANT SHUTDOWN

REVISION RECOMMENDED BY RESULTS REVIEW COMMITTEE

ATTACHMENT E (2)

CHECKLIST DISCREPANCY

Legend Switches and Indicators

PLANT PVNGS	J.K. Lonigro EVALUATOR	HED # ~~34~~ NA
SUBTASK Human Factors	SIGNATURE	CLD # General 7D
CL # General CL ITEM # N/A		DATE 5 Feb 81
CL TITLE Displays	CLD CATEGORY ~~48~~ D	
PANEL TITLE All (where used)	PANEL # All	

CR

CLD DESCRIPTION

Though several specific examples are cited in later checklist discrepancy reports, generally many of the legend switches and indicators have the following problem: Potential for activating switches when relamping.

☐ SUPPORT MATERIAL ATTACHED

POTENTIAL OPERATOR ERROR(S)

Accidental control activation.

RECOMMENDED REVISION

~~Suggest adopting a method for restraining the control portion of the legend switch while the legend cover is being reinstalled.~~

Provide training on proper relamping method.

RECOMMENDED IMPLEMENTATION:

☐ PRIOR TO FUEL LOADING

☐ PRIOR TO PLANT OPERATIONS > 5% POWER

☐ AT A CONVENIENT PLANT SHUTDOWN

ATTACHMENT F (1)

CHECKLIST DISCREPANCY

PLANT PVNGS	J. K. Lonigro EVALUATOR	HED # ~~37~~ NA
SUBTASK Human Factors	J. K. Lonigro SIGNATURE	CLD # 2.029
CL # 2 CL ITEM # 51		DATE 1/5/81

CL TITLE Visuals CLD CATEGORY ~~B~~ C D

PANEL TITLE Turbine PANEL # B-06

CLD DESCRIPTION

On the EHC Control Panel there are five indicators which use a scale progression other than 1, 2, or 5. (See Figure 2.029)

1) Throttle Pressure - 0, 987, 1250
2) 1st Stage Pressure - 0, 800
3) Intermediate Press - 0, 200, 250
4) SPF Position - OUT, IN
5) Load - 0, 300, 600, 900, 1380

(See Figure 2.029)

☒ SUPPORT MATERIAL ATTACHED

POTENTIAL OPERATOR ERROR(S)

Inaccurate display reading.

RECOMMENDED REVISION

Change indicators to reflect a logical progression of numeric values.

RECOMMENDED IMPLEMENTATION:

☐ PRIOR TO FUEL LOADING
☐ PRIOR TO PLANT OPERATIONS > 5% POWER
☐ AT A CONVENIENT PLANT SHUTDOWN

ATTACHMENT F
(2)

CHECKLIST DISCREPANCY

PLANT PVNGS	J. K. Lonigro EVALUATOR J. K. Lonigro SIGNATURE	HED # ~~38~~ NA
SUBTASK Human Factors		CLD # 2.030
CL # 2 CL ITEM # 66		DATE 1/6/81
CL TITLE Visuals	CLD CATEGORY ~~B~~ C D	
PANEL TITLE Feedwater & Steam Gen. Systems	PANEL # B-06	

CLD DESCRIPTION

Meters used to indicate C.V. SIGNAL, PRIMARY STANDBY and I.V. SIGNAL, PRIMARY STANDBY use pointers which cover the numerals of the indicated value. (See Figure 2.030)

☒ SUPPORT MATERIAL ATTACHED

POTENTIAL OPERATOR ERROR(S)

Inaccurate display reading.

RECOMMENDED REVISION

Place numerals outside graduation marks to avoid having numbers covered by pointers.

RECOMMENDED IMPLEMENTATION:

☐ PRIOR TO FUEL LOADING
☐ PRIOR TO PLANT OPERATIONS > 5% POWER
☐ AT A CONVENIENT PLANT SHUTDOWN

ATTACHMENT G

CHECKLIST DISCREPANCY

PLANT PVNGS	J. K. Lonigro EVALUATOR J. K. Lonigro SIGNATURE	HED # 39 NA
SUBTASK Human Factors		CLD # 2.031A
CL # 2 CL ITEM # 56		DATE 1/6/81
CL TITLE Visuals	CLD CATEGORY K & D	
PANEL TITLE Feedwater & Steam Gen. Systems		PANEL # B-06

CLD DESCRIPTION

FWPT A MANUAL/AUTO CONTROL DEVIATION indicator is not labeled with the units being indicated. (See Figure 2.031)

☒ SUPPORT MATERIAL ATTACHED

POTENTIAL OPERATOR ERROR(S)

Operator confusion regarding what parameter is being displayed.

RECOMMENDED REVISION

Change label to reflect the units of deviation.

RECOMMENDED IMPLEMENTATION:

☐ PRIOR TO FUEL LOADING
☐ PRIOR TO PLANT OPERATIONS > 5% POWER
☐ AT A CONVENIENT PLANT SHUTDOWN

REVISION RECOMMENDED BY RESULTS REVIEW COMMITTEE

CHECKLIST DISCREPANCY

ATTACHMENT H (1)

PLANT: PVNGS	J. K. Lonigro (EVALUATOR)	HED #: NA
SUBTASK: Human Factors	J. K. Lonigro (SIGNATURE)	CLD #: 4.024
CL #: 4 CL ITEM #: 52, ~~46~~		DATE: 9 Feb 81
CL TITLE: Controls	CLD CATEGORY: ~~A~~ ~~B~~ D	
PANEL TITLE: Aux Systems	PANEL #: B-07	

CLD DESCRIPTION

"Nuclear CLG Water Heat Exchanger Outlet Temperature Select" control uses a large obtrusive knob to select monitor functions. The knob used for setting this control obscures the control position nomenclature and the pointer is not highlighted to indicate which position the knob is pointing. (See Figure 4.024A)

☒ SUPPORT MATERIAL ATTACHED

POTENTIAL OPERATOR ERROR(S)

Setting controls in positions which are 180° from intended position; not knowing the position of the knob; not knowing what positions are available.

RECOMMENDED REVISION

Change knob such that all possible selections are covered except the one selected. (See Figure 4.024B)

or

Since this is a 6-position switch, each position could be 40° from the other. This will reduce confusion as to which end of the knob is the pointer. (See Figure 4.024C) [R]

RECOMMENDED IMPLEMENTATION:

☐ PRIOR TO FUEL LOADING

☐ PRIOR TO PLANT OPERATIONS > 5% POWER

☐ AT A CONVENIENT PLANT SHUTDOWN

REVISION RECOMMENDED BY RESULTS REVIEW COMMITTE

CHECKLIST DISCREPANCY

ATTACHMENT H (2)

PLANT PVNGS	J. K. Lonigro EVALUATOR	HED # NA
SUBTASK Human Factors	J. K. Lonigro SIGNATURE	CLD # 5.002
CL = 5 CL ITEM # 3		DATE 9 Feb 81

CL TITLE Control/Display Integration CLD CATEGORY S & D

PANEL TITLE Feedwater & Steam Gen. Systems PANEL # B-06

CLD DESCRIPTION

525KV GENERATOR BKR, MAN-SS-918 & 915 - Knob covers switch position nomenclature; control has selectable positions which are opposite to each other; pointer is not highlighted to indicate which position knob is pointing. (See Figure 5.002A)

☒ SUPPORT MATERIAL ATTACHED

POTENTIAL OPERATOR ERROR(S)

Setting controls in positions which are 180° from intended position; not knowing the position of the knob; not knowing what positions are available.

RECOMMENDED REVISION

Change knob such that all possible selections are covered except for the one selected. (See Figure 5.002B)

or

Since this is only a 3-position switch, each position could be 120° from the other. This will reduce confusion as to which end of the knob is the pointer. (See Figure 5.002C) [R]

RECOMMENDED IMPLEMENTATION:

☐ PRIOR TO FUEL LOADING

☐ PRIOR TO PLANT OPERATIONS > 5% POWER

☐ AT A CONVENIENT PLANT SHUTDOWN

ATTACHMENT I

CHECKLIST DISCREPANCY

PLANT PVNGS	A. J. Eschenbrenner EVALUATOR A. Eschenbrenner SIGNATURE	HED # NA
SUBTASK Operator Preparedness		CLD # 11.032
CL # 11 CL ITEM # C.14		DATE 14 Jan 81
CL TITLE Generic, Condensed	CLD CATEGORY ~~B~~ ~~B~~ D	
PANEL TITLE N/A		PANEL # N/A

CLD DESCRIPTION

Computer printouts of alarms print slowly and contain too much extraneous information.

☐ SUPPORT MATERIAL ATTACHED

POTENTIAL OPERATOR ERROR(S)

Inability to find required information and act quickly.

RECOMMENDED REVISION

Use higher speed printers and present only that information necessary to return to a safe mode.

RECOMMENDED IMPLEMENTATION:

☐ PRIOR TO FUEL LOADING
☐ PRIOR TO PLANT OPERATIONS > 5% POWER
☐ AT A CONVENIENT PLANT SHUTDOWN