

COMMONWEALTH EDISON COMPANY
DRESDEN STATION
DETAILED CONTROL ROOM DESIGN REVIEW
FINAL SUMMARY REPORT
REVIEW FINDINGS
VOLUME 2 SECTIONS 1-6
MAY 1985

8505070406 850501
PDR ADOCK 05000237
F PDR

1.0 CHECKLIST

SECTION 1
CONTROL ROOM WORKSPACE

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0001

12 HED: 1.1.3.A-1

CATEGORY: 1 LEVEL: C

FINDING:

ACAD-CAM panels 902-55 and 902-56 obstruct the viewing of the far side of panel 902-3 from the far side of panel 902-8 and vice versa. In addition, when standing in front of panel 902-3, the controls and displays located on panels 902-54, 902-55, and 902-56 and the hydrogen addition panel are not in the operator's view. Annunciators are visible, but in order to view all controls and displays, operators must move. In addition, these panels were reported to be obstacles that interfere with movement (from operator survey response A6-4A). Photo Log (A-1, A-2)

RESPONSE:

As long as the critical displayed information of the annunciators is visible and no display reading is time critical, which is the case, the panel organization poses no problem. While additional operator movement is required to view some of the displays and to operate some of the controls, this factor should not degrade operator performance. There is no need to modify the panels.

IMPLEMENTATION:

As is.

4385/c/61

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0002

12 HED NO.: 1.1.3.A-2

CATEGORY: 3 LEVEL: C

FINDING:

Unit operator desk is positioned such that when the operator is sitting, he has his back to the main control boards; therefore the main control boards are not in his full view unless he turns around. (Photo Log No. F-21).

RESPONSE:

Impact of this design is negligible on performance. The operator is free to move about the control boards without difficulty. His view of the control boards is unobstructed.

IMPLEMENTATION:

Accept as is.

4425/c/18

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0188

12 HED: 1.1.3.A-9

CATEGORY: 2 LEVEL: C

FINDING:

The placement of the center desk in relation to the common panels does not permit the operator full view of the controls and displays. When seated at the center desk, the operator cannot see the controls and displays on panels 923-6-4-5 and 5A.

RESPONSE:

A new center desk has been designed and will be installed.

IMPLEMENTATION:

By the completion of the second refueling outage.

4385/c/58

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0003

12 HED NO.: 1.1.3.C.1-3

CATEGORY: 3 LEVEL: C

FINDING:

Plexi-glass mats located behind the unit desk which are used for chair safety purposes are a potential tripping hazard.

RESPONSE:

Mats will be removed.

IMPLEMENTATION:

By completion of the second refueling outage.

4430/c/7

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0004

12 HED NO.: 1.1.3.C.1-4

CATEGORY: 2 LEVEL: C

FINDING:

Cords of the operator radios located on the control panels (902-3) and the unit desk extend to the floor and may be a tripping hazard.

RESPONSE:

The cords will be replaced.

IMPLEMENTATION:

Completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0005

12 HED: 1.1.3.F.1-5

CATEGORY: 3 LEVEL: C

FINDING:

The distance between panel 902-55 and the file cabinet next to the desk and between the file cabinet and panel 902-56 is 28.5 inches. Bending and kneeling is required to operate the equipment on both panels.

RESPONSE:

The spacing of 28.5 inches is sufficient for operation of the panels, particularly since these panel operations are not time critical. There are no safety implications with this spacing.

IMPLEMENTATION:

cept as is.

4385/c/49

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0078

12 HED NO.: 1.1.3.F.1-8

CATEGORY: 3 LEVEL: C

FINDING:

The distance between the back panel of 902-13 and a table which holds a CRT is 23 inches. Photo Log(A-6)

RESPONSE:

Although this distance is less than optimum, it provides sufficient clearance for operator passage.

IMPLEMENTATION:

Accept as is.

4402/c/83.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0048

12 HED NO.: 1.1.3.F.1-9

CATEGORY: 2 LEVEL: C

FINDING:

The distance between a single row of the equipment/panel and another opposing surface is 38 inches while the minimum recommended separation is 42 inches. Photo Log(J-19)

RESPONSE:

Although the actual separation is a bit less than the recommended distance, the infrequent use of the controls and low potential for inadvertent activation indicate that no action needs to be taken.

IMPLEMENTATION:

Accepted as is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0006

12 HED NO.: 1.1.3.F.2-6

CATEGORY: 2 LEVEL: C

FINDING:

The distance between panels 902-6 and the shelf on the hydrogen addition panel is 28 inches which is 14 inches less than the specified criterion. Photo Log(A-4)

RESPONSE:

Panel has been removed.

IMPLEMENTATION:

Completed.

4/2/c/50

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0575

12 HED NO.: 1.1.3.F.3-10

CATEGORY: 3 LEVEL: C

FINDING:

The backs of the 903-54 and 912-7 panels are only 32 inches apart which is less than the 8 foot recommended separation for easy access to the panel backs if simultaneous work on both was required.

RESPONSE:

Simultaneous access is not required. The current spacing is sufficient for operator passage and maintenance needs.

IMPLEMENTATION:

Accept as is.

4402/c/84

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0007

12 HED: 1.1.3.G-7

CATEGORY: 2 LEVEL: C

FINDING:

The control switches used for the syncroscope are removed when not in use, leaving openings in the control panel.

RESPONSE:

The openings pose no hazard to operators or equipment. While it is not aesthetically pleasing to have holes in the control panel, these are not sufficient size to cause any problem.

IMPLEMENTATION:

As is.

4385/c/57

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0008/0009

12 HED NO.: 1.1.4.A.1-1/1.1.4.B.3-2

CATEGORY: 3 LEVEL: C

FINDING:

The operator has to leave the primary operating area to obtain reference documents and procedures (Photo Log A-8).

RESPONSE:

The new center desk will provide reference procedures and documents within both primary operating areas. Separate shelves or locations will be the operating procedures and documents.

IMPLEMENTATION:

By the completion of the second refueling outage.

4397/c/42

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0010

12 HED NO.: 1.1.4.D-3

CATEGORY: 1 LEVEL: C

FINDING:

Several procedure binders are torn and loose. Paper within the binders is dog eared and loose (Photo Log A-9).

RESPONSE:

The bound copies of the control room procedures will be reviewed and repaired as necessary with new binders.

IMPLEMENTATION:

By the completion of the first refueling outage.

4397/c/40

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0011

12 HED NO.: 1.1.4.E-4

CATEGORY: 1 LEVEL: C

FINDING:

There are no separately stored sets of operating procedures dedicated for Unit 2. All operating procedures are stored in bookcases located between Units 2 and 3. There is only one set of operating procedures, abnormal procedures, surveillance procedures, general procedures, and general abnormal procedures. There are two sets of annunciator procedures and DOP checklists (Photo Log A-11).

RESPONSE:

Operation procedures will be reviewed and appropriate procedures will be selected for duplication to be provided at each unit (2 and 3).

IMPLEMENTATION:

By the completion of the first refueling outage.

4397/c/41

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0362/0368

12 HED NO.: 1.1.5.A-1/F-2

CATEGORY: 3 LEVEL: B

FINDING:

There are shortages in the supply of expendables and spare parts. Specifically mentioned in the operator survey were shortages in light bulbs, charts, and black ink pens for charts, recorder material.

RESPONSE:

A special supply room is in the process of being designed to provide storage for an adequate inventory of items.

IMPLEMENTATION:

By the completion of the second refueling outage.

4409/c/11

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0014

12 HED: 1.2.2.B.1-3

CATEGORY: 1 LEVEL: B

FINDING:

The controls on some M/A Stations are located 61 inches and 64 inches above the floor, which is 1 inch and 4 inches above the specified guideline.

RESPONSE:

A step stool has been provided in the control room.

IMPLEMENTATION:

Completed.

4385/c/48

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0576/0577/0586/0580

12 HED: 1.2.2.B.1-30/1.2.2.C-31/
1.2.2.D.2/1.2.3.C-3

CATEGORY: 1 LEVEL: B

FINDING:

The reach radius for the 5th percentile female shows that only controls within about 20 inches of the edge of the bench boards can be accessed without leaning or stretching. Any controls of the vertical portion of the bench board are not within the reach radius of such a person. Not being able to easily reach controls can result in the delay or the failure to operate a control as required.

RESPONSE:

A step stool has been provided in the control room and a guard rail will be provided to prevent inadvertent actuation of controls.

IMPLEMENTATION:

By the completion of the first refueling outage.

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0017/0018

12 HED: 1.2.2.B.2-6/-7

CATEGORY: 1 LEVEL: C

FINDING:

Control selector switches on the ACAD-CAM panel are located 12 inches above the floor, while the recommended height is 30 inches. (Photo Log A-16)

RESPONSE:

These controls are rarely used as they are for calibration. Inadvertent activation of these controls is not a problem so that no action is required.

IMPLEMENTATION:

As is.

4385/c/47

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0010/0019/0021

12 HED: 1.2.2.D.1-12-13-15

CATEGORY: 1 LEVEL: A

FINDING:

The first row of J-handle controls is less than that recommended by the guideline relative to the front edge of the control panels. Accidental activation of these controls is possible due to their proximity to the front edge of the panel.

RESPONSE:

A guard rail will be installed.

IMPLEMENTATION:

By the completion of the first refueling outage.

4385/c/46

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0442

12 HED NO.: 1.2.2.E.1.B-21

CATEGORY: 2 LEVEL: C

FINDING:

The angle from the line of sight to the face plate of the recorders and displays on the vertical section of the 902-54, 55, 56; 903-55, 56; 923-7 panel is below 45 degrees. The recorders and displays range from 14 to 30 inches above the floor and the angle from the line of sight range from 18 to 25 degrees. Photo Log (O-13, O-14, O-15).

RESPONSE:

The recorders and displays are infrequently used and are redundant indicators. In addition, these items are alarmed.

IMPLEMENTATION:

As is.

4402/c/85

DRESDEN CORRECTIVE ACTIONS

X NO.: 0578

12 HED NO.: 1.2.2.E.1.B-30

CATEGORY: 1 LEVEL: C

FINDING:

Certain displays have a face angle of less than 45 degrees to the line of sight for the 5th percentile female.

RESPONSE:

The cited displays are located above 86.9 inches on the vertical portion of the boards. Most of the cited displays are indicator lights which are not affected by parallax or glare. Some rod position indicators have been cited; there are redundant displays to provide a 5th percentile female operator with this information if necessary.

IMPLEMENTATION:

Accept as is.

4/c/69

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0192

12 HED NO.: 1.2.2.E.2-18

CATEGORY: 2 LEVEL: C

FINDING:

Particular meters located at the top vertical panel of the turbine panel are at a visual angle of 50 degrees. This exceeds the 45 degree limit which allows the operator to view all needed displays without moving.

RESPONSE:

This task is not time critical. Control/display relationships are correct for operation and the need to see both displays is minimal.

IMPLEMENTATION:

Accept as is.

4430/c/3

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0193

12 HED NO.: 1.2.2.E.2-19

CATEGORY: 2 LEVEL: C

FINDING:

The displays on the Recirc Pumps A and B Speed Control and the RWM are not within a 45 degree visual angle of each other. Photo log (J-2).

RESPONSE:

There is no need to simultaneously monitor all three Recirc controllers so that the operator can move to an appropriate viewing position.

IMPLEMENTATION:

As is.

4402/c/86

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0194

12 HED NO.: 1.2.2.E.2-20

CATEGORY: 1 LEVEL: C

FINDING:

The Demand display for the Torus Drywell DP controller is on the controller while the status display is an LED on Panel 3. These displays are not within a 45 visual angle of each other. Photo Log(J-3, J-4)

RESPONSE:

The information on these displays is available on Panel 5 or a CRT.

IMPLEMENTATION:

Accept as is.

4402/c/87

DRESDEN CORRECTIVE ACTIONS

X NO.: 0022/0065

12 HED NO.: 1.2.2.G-14/1.2.2.G-16

CATEGORY: 3 LEVEL: C

FINDING:

There is no foot clearance at the OFF Gas and ACAD CAM System panels.
Photo Log (A-22/F-29)

RESPONSE:

The operations of these panels are not affected by the lack of specific
foot clearance. Further, it is better the operators be required to stand
at least one foot from the boards at least one foot length.

IMPLEMENTATION:

As is.

4421/c/69

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0579

12 HED: 1.2.3.B-2

CATEGORY: 1 LEVEL: C

FINDING:

Only controls within about 20 inches of the edge of bench boards can be reached by 5th percentile females without leaning or stretching. Controls on the vertical portion of the bench board are not within the reach radius of such an individual. Not being able to reach the controls can result in the delay or failure to operate the controls as required.

RESPONSE:

While a 5th percentile female may have a problem while in the seated position, normal procedures require that operators be standing for many tasks. In the standing position, such an individual has no problem reaching the controls.

IMPLEMENTATION:

As is.

4385/c/45

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0581

12 HED NO.: 1.2.3.E.2-4

CATEGORY: 1 LEVEL: C

FINDING:

The angle of the displays faces relative to the line of sight of the seated 5th percentile female is less than the required minimum of 45 degrees.

RESPONSE:

The operator is not usually seated when viewing the displays and in the standing position there is no problem.

IMPLEMENTATION:

As is.

4402/c/89

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0023

12 HED NO.: 1.2.3.G-1

CATEGORY: 3 LEVEL: C

FINDING:

The minimum knee clearance at the sit down console (Reactor Panel) is 15 inches which is three inches less than the specified guideline.
Photo Log(A-23)

RESPONSE:

The console is infrequently used and the clearance does not influence operator performance.

IMPLEMENTATION:

Accept as is.

4402/c/88

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0004

12 HED NO.: 1.2.5.A.1-1

CATEGORY: 2 LEVEL: C

FINDING:

Toggle switches are located 78.5 inches above the floor which is 8.5 inches above the specified guideline. Photo Log(A-29)

RESPONSE:

These are infrequently used toggle switches and are not critical for operations.

IMPLEMENTATION:

Accepted as is.

4402/c/51

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0005

12 HED NO.: 1.2.5.A.1-2

CATEGORY: 2 LEVEL: C

FINDING:

Thumbwheel switches are located 84 inches above the floor which is 14 inches above the specified guideline. Photo Log(A-30)

RESPONSE:

The thumbwheel switches are infrequently used and are not critical to operations.

IMPLEMENTATION:

Accept as is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0006/007

12 HED NO.: 1.2.5.A.1-3/1.2.5.A.1-4

CATEGORY: 2 LEVEL: C

FINDING:

Control switches are located 24 inches above the floor which is 6 inches below the specified guideline. Photo Log(A-31, A-32)

RESPONSE:

The controls are infrequently used without operator problems.

IMPLEMENTATION:

Accept as is.

4/17/c/53

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0079/0080

12 HED NO.: 1.2.5.A.1-8/1-9

CATEGORY: 1 LEVEL: C

FINDING:

The On-Off selector switch on Panel 902-10 is located 14 inches above the floor which is 16 inches below the specified guideline. Photo Log (C-31, K-3)

RESPONSE:

A switch guard will be added.

IMPLEMENTATION:

By the completion of the second refueling outage.

4402/c/89

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0081

12 HED NO.: 1.2.5.A.1-10

CATEGORY: 2 LEVEL: B

FINDING:

The on-off control switch is located 19 inches above the floor. (11 inches below the specified guideline). (Photo Log C-33)

RESPONSE:

This control is infrequently used and is currently protected from accidental activation.

IMPLEMENTATION:

As is.

4430/c/1

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0082

12 HED NO.: 1.2.5.A.1-11

CATEGORY: 1 LEVEL: C

FINDING:

The Containment Isolation Control switches are placed 27 inches above the floor (3 inches below the specified criteria). The on-off control switch is 29.5 inches above the floor (.5 inches below the specified guideline). Photo Log (K-4)

RESPONSE:

The controls are not susceptible to being kicked or bumped accidentally because of the guards which are part of the module. They are frequently used and are very close to the guideline.

IMPLEMENTATION:

As is.

4421/c/73

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0083

12 HED NO.: 1.2.5.A.1-12

CATEGORY: 1 LEVEL: C

FINDING:

The Containment Isolation Control switches are placed 18 inches above the floor. (12 inches below the specified criteria). The on-off control switch is placed 20.5 inches above the floor. (9.5 inches below the specified criteria.). Photo Log (K-5)

RESPONSE:

These controls are infrequently used and are not susceptible to being knocked or bumped accidentally because of the guard installed as part of the module.

IMPLEMENTATION:

As is.

4421/c/72

DRESDEN CORRECTIVE ACTIONS

X NO.: 0084

12 HED NO.: 1.2.5.A.1-13

CATEGORY: 2 LEVEL: C

FINDING:

The Feedwater Flow Controls are placed 18.5 inches above the floor. (11.5 below the specified criteria). Photo Log (K-6)

RESPONSE:

These controls appear to be positioned such that they would not be accidentally bumped or kicked. These controls are not used by the operators, they are setpoint adjustments used by the instrumentation staff.

IMPLEMENTATION:

As is.

4421/c/71

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0085

12 HED NO.: 1.2.5.A.1-14

CATEGORY: 1 LEVEL: C

FINDING:

The controls are 28 inches above the floor which is 2 inches below the specified criterion. Photo Log(D-1)

RESPONSE:

The controls are not used by the operators and have locking screws to prevent inadvertent activation.

IMPLEMENTATION:

As is.

4402/c/64

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0086

12 HED NO.: 1.2.5.A.1-15

CATEGORY: 2 LEVEL: C

FINDING:

The Range Selector switch is 72 inches above the floor which is 2 inches above the specified criterion. The power, pen, and chart controls are 74.5 inches above the floor which is 4.5 inches above the specified criterion. Photo Log(D-2)

RESPONSE:

These switches and controls are infrequently used are close to the recommended guideline.

IMPLEMENTATION:

As is.

4402/c/64

DRESDEN CORRECTIVE ACTIONS

NO: 0087

12 HED NO.: 1.2.5.A.1-16

CATEGORY: 2 LEVEL: C

FINDING:

96 toggle switches are located between 77 and 90 inches above the floor. (7 to 20 inches above the specified criteria). Photo Log (E-1)

RESPONSE:

A step stool has been provided in the control room to assist operators in manipulating controls on the back panels.

IMPLEMENTATION:

Completed.

4424/c/16

DRESDEN CORRECTIVE ACTIONS

X NO.: 0088

12 HED: 1.2.5.A.1-17

CATEGORY: 1 LEVEL: C

FINDING:

The controls on these modules (acoustic monitoring toggle switches) are located between 79 and 91 inches above the floor, which is 9 to 21 inches above the specified criterion. (Photo Log E-2)

RESPONSE:

A step stool has been provided for operator use.

IMPLEMENTATION:

Completed.

4385/c/44

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0089

12 HED: 1.2.5.A.1-18

CATEGORY: 1 LEVEL: C

FINDING:

The on-off controls for the 2 displays (power supplies for area and process radiation monitoring) are located 71 inches above the floor, which is 1 inch above the specified criterion. (Photo Log E-3 and E-4)

RESPONSE:

Control height is only 1 inch above criterion. When necessary, operators use a step stool.

IMPLEMENTATION:

As is.

4385/c/43

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0091

12 HED NO.: 1.2.5.A.1-20

CATEGORY: 1 LEVEL: C

FINDING:

The toggle switches for row 51 (CRD test switches) are located 72 inches above the floor, row 55 switches are located 74 inches above the floor, and row 59 switches are located 76 inches above the floor. These values are 2.0, 4.0, and 6.0 inches respectively above the specified criterion. Photo Log(E-5)

RESPONSE:

These switches are infrequently used. There is minimum discrepancy between actual and guideline heights.

IMPLEMENTATION:

Accept as is.

4/1/66

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0092

12 HED NO.: 1.2.5.A.1-21

CATEGORY: 1 LEVEL: C

FINDING:

The On-Off control switches (RPS DC Power Supply) are located 82.5 inches above the floor which is 12.5 inches above the specified criterion. Photo Log(E-6)

RESPONSE:

The switches are rarely used. Although they are a bit higher than desirable, their infrequent use and minor consequences of inadvertent activation indicate that no action is required.

IMPLEMENTATION:

Accept as is.

4402/c/67

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0093

12 HED NO.: 1.2.5.A.1-22

CATEGORY: 2 LEVEL: C

FINDING:

The top three rows of toggle switches (31 switches). Area and Vent Monitor recorder are located between 70.0 and 74.5 inches above the floor which is from 0.0 to 4.5 inches above the specified criterion. Photo Log(E-7)

RESPONSE:

The controls are infrequently used and being located close to the criterion, no action needs to be taken.

IMPLEMENTATION:

Not as is.

4402/c/68

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0094

12 HED NO.: 1.2.5.A.1-23

CATEGORY: 2 LEVEL: C

FINDING:

The control (CRD alarm system set points) is located 74 inches above the floor which is 4 inches above the specified guideline. Photo Log(E-8)

RESPONSE:

The control is not used by the operators as it is an alarm setpoint at a higher level. This, plus its location above recommendations preclude inadvertent activation so that no action should be taken.

IMPLEMENTATION:

Accepted as is.

4402/c/69

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0095

12 HED: 1.2.5.A.1-24

CATEGORY: 2 LEVEL: C

FINDING:

The controls on "Set A" are between 77 and 80 inches above the floor which is 7 to 10 inches above the specified criterion. The controls on "Set B" are located 71 inches above the floor which is 1 inch above the specified criterion. Photo Log (E-9).

RESPONSE:

The controls are not used by the operators as they are alarm setpoint adjusters. This, plus its location above recommendations preclude inadvertent activation so that no action should be taken.

IMPLEMENTATION:

As is.

4399/c/30

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0008/0049

12 HED NO.: 1.2.5.B.1-5

CATEGORY: 2 LEVEL: C

FINDING:

The top 6 rows (40 total out of 42 displays) are above 70 inches from the floor. They are between 67 inches and 94 inches from the floor. This is a maximum of 24 inches above the specified criteria. Photo Log(K-16, A-34) (345 KV panel)

RESPONSE:

A step stool has been provided to be used if required.

IMPLEMENTATION:

Completed

4402/c/69

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0009

12 HED NO.: 1.2.5.B.1-6

CATEGORY: 2 LEVEL: C

FINDING:

The meters are located 85 inches above the floor which is 15 inches above the specified guideline. Photo Log(A-33)

RESPONSE:

These meters are rarely read and when a reading is performed, a push-to-read button must be pressed. As a unique set of steps to read the meter is required, there is little chance of operator error even with the displays located higher than desirable.

IMPLEMENTATION:

Accept as is.

4/11/58

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0010

12 HED NO.: 1.2.5.B.1-7

CATEGORY: 2 LEVEL: C

FINDING:

The displays are located 86 inches above the floor which is 16 inches above the specified guideline. Photo Log(A-30)

RESPONSE:

The display is easily and accurately viewed by the standing operator. This display is infrequently used.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

X NO.: 0096

12 HED: 1.2.5.B.1-25

CATEGORY: 1 LEVEL: C

FINDING:

"Containment Pressure A" and Reactor Building Vent Exhaust monitors are 28 inches above the floor, which is 13 inches below the specified criterion. "Containment Pressure B Monitor" is 18 inches above the floor, which is 23 inches below the specified guideline.

RESPONSE:

These displays are used as secondary displays to validate other displayed data.

IMPLEMENTATION:

As is.

4385/c/42

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0097

12 HED NO.: 1.2.5.B.1-26

CATEGORY: 1 LEVEL: C

FINDING:

The recorders are located 18.5 inches above the floor which is 22.5 inches below the specified criterion. Photo Log (E-11)

RESPONSE:

The recorders are infrequently read. Rather, the information obtained on these recorders is archived so that there is infrequent operator stooping to use them.

IMPLEMENTATION:

As is.

4402/c/61

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0098/0099

12 HED NO.: 1.2.5.B.1-27/1-28

CATEGORY: 1 LEVEL: C

FINDING:

The displays (steam line RAD monitors) are located 30.5 inches above the floor which is 10.5 inches below the specified criterion. (Photo Log E-12, E-13).

RESPONSE:

The cited displays are not frequently used and their location does not present a problem.

IMPLEMENTATION:

As is.

4380/c/68

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0100/0101/0102

12 HED NO.: 1.2.5.B.1-29/1.2.5.B.1-30/1.2.5.B.1-31

CATEGORY: 2 LEVEL: C

FINDING:

These displays are located 38.5 inches above the floor which is 2.5 inches below the specified guideline. Photo Log(E-14, E-15, E-16)

RESPONSE:

The displays are infrequently used, and easily read in their current location and the slightly lower height of them poses no problem for misreading.

IMPLEMENTATION:

As is.

4402/c/60

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0103

12 HED NO.: 1.2.5.B.1-32

CATEGORY: 1 LEVEL: C

FINDING:

Three displays are located 38 inches above the floor which is 3 inches below the specified guideline. Photo Log(E-17)

RESPONSE:

These displays are infrequently used and while they are a bit lower than desired, there is little chance for misreading.

IMPLEMENTATION:

Accepted as is.

4402/c/62

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0104

12 HED: 1.2.5.B.1-33

CATEGORY: 1 LEVEL: C

FINDING:

The recorder for "Div 1" is 26.5 inches above the floor, which is 15.5 inches below the specified criterion. The recorder for "Div 2" is 16.5 inches above the floor, which is 25.5 inches below the specified criterion. (Photo Log E-18)

RESPONSE:

The recorders are used only once a shift.

IMPLEMENTATION:

Accept as is.

4385/c/41

DRESDEN CORRECTIVE ACTIONS

X NO.: 0105

12 HED: 1.2.5.B.1-34

CATEGORY: 1 LEVEL: C

FINDING:

The display (flux amplifiers) is located 38 inches above the floor, which is 3 inches below the specified criterion. (Photo Log E-19)

RESPONSE:

The display is infrequently used and redundant information is available. It is non-critical and the display location is close to the criterion.

IMPLEMENTATION:

As is.

4385/c/40

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0106

12 HED NO.: 1.2.5.B.1-35

CATEGORY: 2 LEVEL: C

FINDING:

These displays (Area Radiation Monitors) are located 84.5 inches above the floor which is 14.5 inches above the specified criterion. Photo Log(E-20)

RESPONSE:

The displays are infrequently used and have redundant alarms.

IMPLEMENTATION:

Accept as is.

440 2/63

DRESDEN CORRECTIVE ACTIONS

X NO.: 0107

12 HED: 1.2.5.B.1-36

CATEGORY: 1 LEVEL: C

FINDING:

The LED displays for the flow detectors (acoustic monitors) are located between 82.5 and 87.5 inches above the floor, which is 12.5 to 17.5 inches above the specified criterion. (Photo Log E-21)

RESPONSE:

While the displays are above eye level for optimum viewing, they are sufficiently bright to be noticed, even above eye height.

IMPLEMENTATION:

As is.

4385/c/39

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0108

12 HED NO.: 1.2.5.B.1-37

CATEGORY: 1 LEVEL: C

FINDING:

The indicator lights are located between 84.5 and 90.0 inches above the floor which is 14.5 to 20.0 inches above the specified criterion.
Photo Log(E-22)

RESPONSE:

A step stool has been provided to make it easier for operators to view the indicators.

IMPLEMENTATION:

Completed.

4402/c/71

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0166

12 HED NO.: 1.2.5.B.1-38

CATEGORY: 1 LEVEL: C

FINDING:

The displays (Off-Gas Timers) are located 84.5 inches above the floor, which is 14.5 inches above the criterion. Photo Log(F-17)

RESPONSE:

These displays only provide the amount of time left on a timer and are not accurate readings.

IMPLEMENTATION:

Accept as is.

44 c/72

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0265 _____

12 HED NO.: 1.2.5.B.1-39 _____

CATEGORY: 2 LEVEL: C _____

FINDING:

The displays (Flux tilt monitors) are located between 73.5 and 70.0 inches above the floor which is 3.5 to 7.0 inches above the specified criterion. Photo Log(K-32)

RESPONSE:

The displays are not normally used by the operators.

IMPLEMENTATION:

As is.

4402/c/72

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0266

12 HED NO.: 1.2.5.B.1-40

CATEGORY: 2 LEVEL: C

FINDING:

The recorders are located between 68 and 74 inches above the floor which is a maximum of 4 inches above the specified criterion. Photo Log(N-21)

<u>PANEL</u>	<u>EPN</u>	<u>LABEL</u>
902-21	2-260-20A	Valve Leak and H ₂ O Temp Recorder
902-21	2-340-16	Rod Drive Temp Recorder
903-21	03-340-16	Rod Drive Temp Recorder
903-21	3-260-20A	Valve Leak and H ₂ O Temp Recorder

RESPONSE:

The recorders straddle the criterion and are never more than 4 inches above it. The current recorder location poses no operator problem.

IMPLEMENTATION:

As is.

4402/c/74

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0267

12 HED NO.: 1.2.5.B.1-41

CATEGORY: 1 LEVEL: C

FINDING:

These displays are located between 73.5 and 76 inches above the floor, which is 3.5 to 6.0 inches above the specified criterion.
Photo Log(N-22)

<u>PANEL</u>	<u>EPN</u>	<u>LABEL</u>
902-10	02-10-2	Process Supply Process Monitor
902-10	02-10-3	ISO Condenser Vent Monitor A
902-10	02-10-4	Reactor Bldg Vent Ch A
902-10	02-10-5	Reactor Bldg. F Pool Ch A
903-10	03-10-2	Power Supply Process Monitor
903-10	03-10-3	Isol Cond Vent Monitor A
903-10	03-10-4	Reactor Bldg Vent Mon A
903-10	03-10-5	Reactor Bldg F Pool Ch A

RESPONSE:

Although slightly above the criterion, the displays pose no problems in their current position.

IMPLEMENTATION:

As is.

4402/c/75

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0268

12 HED NO.: 1.2.5.B.1-42

CATEGORY: 2 LEVEL: C

FINDING:

The displays are located above the specified maximum criterion height of 70 inches. The X-Y recorder is located between 65 and 73 inches above the floor. The Detector Position is located between 71 and 72 inches above the floor. Photo Log(N-23)

<u>PANEL</u>	<u>EPN</u>	<u>LABEL</u>
902-13	02-13-1	X-Y Recorder
902-13	02-13-6	Drive Channel C Detector Position
903-13	02-13-6	Drive Channel C Detector Position
903-13	03-13-1	X-Y Recorder

RESPONSE:

The X-Y recorder straddles the criterion and the Detector Position is only a maximum of 2 inches above the criterion.

IMPLEMENTATION:

As is.

4402/c/76

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0119

12 HED NO.: 1.2.5.B.1-43

CATEGORY: 1 LEVEL: C

FINDING:

The displays are located above the specified maximum criterion height of 70.0 inches. They are all between 67.0 and 72.5 inches above the floor. Photo Log(K-17)

<u>PANEL</u>	<u>EPN</u>	<u>LABEL</u>
923-5A	2-8540-6	Primary Containment Oxygen Concentration
923-5A	2-8540-8	Nitrogen Purge Flow to Primary Cont.
923-5A	3-8540-6	Primary Containment Oxygen Concentration
923-5A	3-8540-8	Nitrogen Purge Flow to Primary Cont.

RESPONSE:

The displays straddle the criterion and are never more than 2.5 inches above it. The current display location poses no operator problem.

IMPLEMENTATION:

As is.

4402/c/77

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0120

12 HED NO.: 1.2.5.B.1-44

CATEGORY: 2 LEVEL: C

FINDING:

The display is located between 70 and 73 inches above the floor which is a maximum of 3 inches above the specified criterion. Photo log(K-18)

<u>PANEL</u>	<u>EPN</u>	<u>LABEL</u>
923-4	2-2002-112	U2 Reactor Bldg. EQ DRN tank temp.
923-4	3-2002-112	U3 Reactor Bldg. EQ DRN tank temp.

RESPONSE:

The display is used only a few times per shift and just about straddles the criterion.

IMPLEMENTATION:

Accept as is.

4402/c/78

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0121

12 HED NO.: 1.2.5.B.1-45

CATEGORY: 2 LEVEL: C

FINDING:

The top row of eighteen displays on this panel are located between 68 and 73 inches above the floor which is a maximum of 3 inches above the specified criterion. Photo Log(K-19)

<u>PANEL</u>	<u>EPN</u>	<u>LABEL</u>
923-1	23-1-1	Rx Bldg2 CCW Dsch HDR Pressure
923-1	23-1-10	SW Sply Pressure
923-1	23-1-11	3C 1Air Heater Pressure
923-1	23-1-12	Fire HDR Pressure
923-1	23-1-13	Steam Pressure
923-1	23-1-14	S. Air HDR Pressure
923-1	23-1-15	U2 1 Air HDR Pressure
923-1	23-1-16	U3 1 Air HDR Pressure
923-1	23-1-17	Makeup HDR Pressure
923-1	23-1-18	Clean HDR Pressure
923-1	23-1-2	Rx Bldg2 CCW Dsch HDR Temp
923-1	23-1-3	Rx Bldg3 CCW Dsch HDR Pressure
923-1	23-1-4	Rx Bldg3 CCW Dsch HDR Temp
923-1	23-1-5	Turb Bldg2 CCW Dsch HDR Pressure
923-1	23-1-6	Turb Bldg2 CCW Dsch HDR Temp
923-1	23-1-7	Turb Bldg3 CCW Dsch HDR Pressure
923-1	23-1-8	Turb Bldg3 CCW Dsch HDR Temp
923-1	23-1-9	SWP Dsch Pressure

RESPONSE:

These displays straddle the specified criterion and have sufficient readability to operators as currently positioned.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0122/0101/0102

12 HED NO.: 1.2.5.B.1-46

CATEGORY: 2 LEVEL: C

FINDING:

The top row of thirty-two displays are located between 68 and 73 inches above the floor which is a maximum of 3 inches above the specified criterion. Photo Log(K-20, K-21)

<u>PANEL</u>	<u>EPN</u>	<u>LABEL</u>
923-5	23-5-1	U2 Rx SPL Air Temperature
	23-5-10	U2 M Turb Exh Temp.
	23-5-11	U2 E Turb Sply Temp.
	23-5-12	U2 E Turb Exh Temp.
	23-5-13	U2 E Turb Cnt Water Level
	23-5-14	U2 E Turb Atmos Water Level
	23-5-15	U2 Op Floor Cavity Water Level
	23-5-16	U2 Op Floor Atmos.
	23-5-17	2/3 Sply Air Temp.
	23-5-18	2/3 Exh Air Temp.
	23-5-19	2/3 RW Bldg Cnt Water L
	23-5-2	U2 Rx Exh Air Temp.
	23-5-20	2/3 RW Bldg Atmos.
	23-5-21	U3 Sply Air Temp.
	23-5-22	U3 Exh Air Temp.
	23-5-23	2/3 Refuel Flr to D3 Cnt W Level
	23-5-24	U3 Drywell Air Temp.
	23-5-25	U3 DW/TR Purge Temp.
	23-5-26	U3 N Turb Sply Temp.
	23-5-27	U3 S Turb Sply Temp.
	23-5-28	U3 M Turb Sply Temp.
	23-5-29	U3 of Floor Cavity Water Level
	23-5-3	U2 Outside Air Temp.
	23-5-30	Heater A Out Temp.
	23-5-31	System Dsch Volume
	23-5-32	Heater B Out Temp.
	23-5-4	U2 Atmos to Refuel Floor Water Level
	23-5-5	U2 Op Floor Cnt Water Level
	23-5-6	U2 Drywell Air Temp.
	23-5-7	U2 DW/TR Purge Temp.
	23-5-8	U2 N Turb Sply Temp.
	23-5-9	U2 S Turb Sply Temp.

DRESDEN CORRECTIVE ACTIONS

RESPONSE:

The displays straddle the criterion and are never more than 3 inches above it.

IMPLEMENTATION:

Accept as is.

4402/c/80

DRESDEN CORRECTIVE ACTIONS

EX NO: 0049

12 HED NO.: 1.2.5.B.1-50

CATEGORY: 2 LEVEL: C

FINDING:

Twenty displays on panel P-18 used for 138KV operation are located above the 70" maximum required height. The highest display is located at 97".

RESPONSE:

There is no difficulty in reading these displays. In addition, the consequences of misreading the displays are minimal.

IMPLEMENTATION:

As is.

4424/c/17

DRESDEN CORRECTIVE ACTIONS

X NO.: 0025

12 HED NO.: 1.2.6-1

CATEGORY: 3 LEVEL: B

FINDING:

There are no provisions made so that procedures and other reference documents can be consulted at the consoles while performing task sequences. The operator has to either hold the procedure or place it on a desk or nearby table.

In addition, during the validation, operators were observed holding procedures in their hands while at the consoles and laying them open on the panels while they carried out appropriate steps (Photo Log A-35 and 36).

RESPONSE:

A cart, specifically designed for the procedures, will be provided at each site to allow the operators to lay the procedures on, to free up their hands.

IMPLEMENTATION:

By the completion of the second refueling outage.

4397/c/43

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0123

12 HED NO.: 1.2.7.D.2-4

CATEGORY: 3 LEVEL: C

FINDING:

The top of the center desk is 40 inches above the floor but the specified guideline states that it should be between 36 and 38 inches above the floor. Photo Log(K-26)

RESPONSE:

The desk will be replaced.

IMPLEMENTATION:

By the completion of the second refueling outage.

4 c/01

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0124/0582/0125/0126

12 HED NO.: 1.2.8.A-1/D-1/E-2/G-3

CATEGORY: 3 LEVEL: C

FINDING:

The chair at the center desk does not pivot so that the operator cannot adjust position. The seat is stationary on the base and does not move. Photo Log(K-27, K-28)

RESPONSE:

Appropriate new chairs will be provided with the new center desk.

IMPLEMENTATION:

By the completion of the second refueling outage.

4/11/02

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0346, 0347

12 HED NO.: 1.3.1.E.1-1/3-2

CATEGORY: 1 LEVEL: B

FINDING:

In situations when Unit 3 must rely on the 2/3 deisel generator, the control of the 2/3 diesel generator by Unit 2 can affect the control of Unit 3. In addition, operator survey responses indicated that there are operational problems with the 2/3 diesel in that there are some displays on Unit 3 but, all the controls and many of the displays are on Unit 2.

RESPONSE:

Appropriate Bus Voltage indication will be selected and installed in Unit 3

IMPLEMENTATION:

By the completion of the first refueling outage.

4421/c/67

DRESDEN CORRECTIVE ACTIONS

IN NO.: 0583, 0584

12 HED NO.: 1.3.2.A-1, 1.3.2.B-1

CATEGORY: 1 LEVEL: B

FINDING:

Dedicated crews are not used on the mirror imaged units or the center desk. Dedicated crews help to prevent errors due to the changes in location of displays and controls because of the mirror imaging and the distinction between units is not heightened as much as possible.

RESPONSE:

Although the panel arrangements across units are mirrored, the actual systems, with few exceptions, are not. The distinction between units will be clearly made through the use of distinctive labeling and guard rails.

IMPLEMENTATION:

By completion of the first refueling outage.

4421/c/66

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0168

12 HED NO.: 1.4.1.A-1

CATEGORY: 3 LEVEL: 2

FINDING:

Operator protective clothing is not kept in the control room. Breathing apparatus is kept in the control room, however.

RESPONSE:

Plant design and or procedure eliminate the need for protective clothing. Protective clothing can be obtained from the RAD/CHEM department if and when needed.

IMPLEMENTATION:

As is.

4409/c/9

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0225/0226/0102

12 HED NO.: 1.5.2.B-1/OS-1/B-2/B-3

CATEGORY: 2 LEVEL: C

FINDING:

Air velocities in the primary operating area exceed the guideline value of 45 feet per minute. The readings ranged from 0 feet per minute to 80 feet per minute.

RESPONSE:

MSTD-1472 C states that 100 feet per minute is an acceptable maximum air velocity and that 65 feet per minute is preferred. There were a few readings above 65 feet per minute.

IMPLEMENTATION:

As is.

4409/c/6

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0214, 0215, 0094

12 HED NO.: 1.5.3.A-1 1.5.3.A-2
1.5.3.A-3

CATEGORY: 2 LEVEL: C

FINDING:

The illumination levels at the panels in the primary operation area (7.83-34 footcandles), common panels (9.33-44.33 footcandles) and at the back (7.83-37.67 footcandles) panels are below 20 footcandles.

RESPONSE:

Illumination levels in the control room will be increased. Various methods will be employed to review all aspects of lighting, luminance, reflectance, etc. to determine the optimum lighting configuration.

IMPLEMENTATION:

By completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0221, 0222, 0100

12 HED NO.: 1.5.3.B-4 1.5.3.B-6
1.5.3.B-5

CATEGORY: 2 LEVEL: C

FINDING:

Illumination levels at workstations in the primary operating back panels and common panels vary by more than 10 foot candles.

RESPONSE:

Illumination levels which vary more than 10 footcandles across workstations will be examined and corrected as result of a comprehensive lighting study and retrofit.

IMPLEMENTATION:

By the completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0220, 0221, 0223

12 HED NO.: 1.5.3.C-19 1.5.3.C-20
1.5.3.C-7

CATEGORY: 2 LEVEL: C

FINDING:

The illumination level at the center desk is 30 footcandles. The Shift Technical Advisory desk measures 26 footcandles and the NSO desk does not meet the guideline of 50 footcandles.

RESPONSE:

Illumination levels will be increased to meet specifications by providing a desk top light or by installing additional lights over the top of the desk. The illumination levels will be increased to a minimum of 50 footcandles.

IMPLEMENTATION:

By the completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0227, 0228, 0103

12 HED NO.: 1.5.3.E.2-10, 1.5.3.E.2-11
1.5.3.E.2-12

CATEGORY: 2 LEVEL: C

FINDING:

Labels, instructions and other written information such as displays, recorders and control switch positions are shadowed within the primary operating area, the back panels, and the common panels. (Photo Log K-22, K-23.)

RESPONSE:

The illumination levels in the control room will be increased, and other modifications to the lighting system will be evaluated to eliminate the shadowing which is occurring on the panels in the control room.

IMPLEMENTATION:

at completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0229/0104

12 HED NO.: 1.5.3.F-13/-14

CATEGORY: 2 LEVEL: C

FINDING:

Glare is present on displays and recorders, within the primary operating area that can interfere with their readability. Glare exists on equipment that is located on both the horizontal and vertical panels. The glare is produced by the overhead lighting as well as the panel indicator lights. Photo Log(K-24)

RESPONSE:

The control room lighting review package will provide appropriate modifications to minimize glare.

IMPLEMENTATION:

By the completion of the second refueling outage.

4409/c/24

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0487

12 HED NO.: 1.5.3.G-15

CATEGORY: 2 LEVEL: C

FINDING:

The percent reflectance of the control panels is not between 20% and 40%. The percent reflectances measured range from 37% to 47% with the majority above 40%. Providing adequate reflectance allows for good contrast between the panel and indicator lights as well as reducing the possibility of eye strain.

RESPONSE:

The percent reflectance readings ranged between 37% and 47%. The difference in highest reflectance levels versus the recommended maximum level is only 7%.

IMPLEMENTATION:

As is.

4397/c/61

DRESDEN CORRECTIVE ACTIONS

12 HED NO.: 0488

12 HED NO.: 1.5.3.G-17

CATEGORY: 2 LEVEL: C

FINDING:

The percent reflectance of the floor is not between 15% and 30%. The percent reflectances were measured at 9.75% to 10.75%.

RESPONSE:

The existing carpet will be replaced with a carpet that will provide appropriate reflectance.

IMPLEMENTATION:

By completion of the second refueling outage.

4397/c/62

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0489

12 HED NO.: 1.5.3.G-21

CATEGORY: 2 LEVEL: C

FINDING:

The percent reflectance of the walls of the control room is 17 percent. The reflectance should be between 40 and 60 percent on the upper portion of the walls to allow sufficient reflected light to reach the work area.

RESPONSE:

Because of the design of the control room, the reflectance from the walls has a negligible influence on operations.

IMPLEMENTATION:

Accept as is.

4409/c/4

DRESDEN CORRECTIVE ACTIONS

WORK NO.: 0208/0090/0209

12 HED: 1.5.5.A-1/A-2/A-3

CATEGORY: 2 LEVEL: B

FINDING:

The background noise levels in the primary operating area exceed 65dB (A). The average noise level readings obtained range from 66.3dB(A) to 69.3dB(A) at different positions in the control room. Lower background noise levels allow for unimpaired and intelligible communication.

RESPONSE:

The ambient noise level will be reduced by using noise-attenuating techniques and materials on sources of noise emissions.

IMPLEMENTATION:

By completion of the second refueling outage.

4399/c/16

SNED

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0169, 0189

12 HED NO.: 1.5.7.B.3-1, 1.5.7.B.3-2

CATEGORY: 2 LEVEL: C

FINDING:

There are no provisions for communications to the restroom and kitchen facilities.

RESPONSE:

The kitchen and restroom are in close proximity to the control room. All personnel do not enter these areas without formal relief from a watch station. Control areas are not left without proper coverage.

IMPLEMENTATION:

Accepted as is.

4381c/pq49

SECTION 2
COMMUNICATIONS

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0424/0425

12 HED NO.: 2.1.3.A.1-6/2.1.3.A.2-8

CATEGORY: 2 LEVEL: C

FINDING:

The sound-powered telephones do not provide in-phase feedback to the user, and the frequencies do not fall completely within the 200-300 Hz range. The individual who is using the phone cannot hear what he or she is saying through the headphones.

RESPONSE:

Operators do not use the sound-powered phones. They are used only by the instrument mechanics.

IMPLEMENTATION:

Accept as is.

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0239, 0110

12 HED NO.: 2.1.3.B.6-3, 2.1.3.B.6-4

CATEGORY: 2 LEVEL: C

FINDING:

The headsets used with sound powered phones are not kept in the control room. They are stored in the instrument mechanic's office.

RESPONSE:

The sound-powered phones are not used by control room operators. They are used only by the instrument mechanics.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0235, 0109

12 HED NO.: 2.1.3.D.2-1, 2.1.3.D.2-2

CATEGORY: 2 LEVEL: C

FINDING:

Jacks for the sound powered phones are not installed on the above panels. When performing tasks at these panels using the sound powered phones, the jacks installed on panels 902-3 or 902-7 must be used. (Photo Log L-22).

RESPONSE:

The sound powered phone jacks are not used by control room operators. They are used by instrument mechanics when calibrating equipment in the control room. Nonetheless, procedures will be reviewed and modified to include care when draping wires on floor.

IMPLEMENTATION:

By completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

X NO.: 0275

12 HED NO.: 2.1.3.E.3-5

CATEGORY: 2 LEVEL: C

FINDING:

There are 4 cords located at the patch panel for the sound powered phone system. Since there are 5 jacks at the main control room panels for the sound powered phones, a minimum of 5 cords are needed at the patch panel. By having 5 cords available can ensure that if necessary individuals can communicate from each location in the primary operating area.

RESPONSE:

The operators don't use the sound powered phones.

IMPLEMENTATION:

As is.

4421/c/76

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0260

12 HED NO.: 2.1.6.A-1

CATEGORY: 2 LEVEL: C

FINDING:

The unit operator does not have the capability to access the plant public address system. Also, the speaker above panel 902-5 is not functional.

RESPONSE:

There is not adequate need to provide access to the P.A. at the unit op's desk. The speaker above panel 902-5 will be repaired.

IMPLEMENTATION:

Accept as is.

4402/c/i7

DRESDEN CORRECTIVE ACTIONS

X NO.: 0114, 0263, 0116

12 HED: 2.1.6.A.2-2/2.1.6.E.2-5/
2.1.6.C.1-3

CATEGORY: 2 LEVEL: C

FINDING:

The only speaker which is connected with the P.A. system is located on the phone module itself which is located on the center desk. This can be heard by the operator when he is sitting at the desk, however it can not be heard clearly at other areas in the control room.

RESPONSE:

Typically, operators do not use the P.A. system to contact other operators inside the control room, the kitchen or the restrooms. All areas are within easy voice contact.

IMPLEMENTATION:

As is.

4385/c/38

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0127

12 HED: 2.1.6.D-7

CATEGORY: 3 LEVEL: C

FINDING:

There is no documented procedure which states the proper way to speak when using the public address system.

RESPONSE:

This is not a significant problem since the operators do not use the public address system very often. They primarily use the radio walkie-talkies to contact individuals within the plant. In addition, the operators are sufficiently trained in the use of the communications equipment.

IMPLEMENTATION:

As is.

4385/c/14

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0117

12 HED: 2.1.6.F-6

CATEGORY: 2 LEVEL: C

FINDING:

Control room inputs (from the center desk) to the plant announcing system do not have priority over other inputs. In cases when more than one location is sending messages over the system, the messages interfere with each other.

RESPONSE:

The plant announcing system will be redesigned so that the control room has priority over all other locations. An override capability will be provided in the control room.

IMPLEMENTATION:

By the completion of the second refueling outage.

4385/c/13

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0246/0111/0350/0162

12 HED NO.: 2.1.8.B-1/2.1.8.B-2/2.1.8.C.1-3/2.1.8.C.1-4

CATEGORY: 2 LEVEL: C

FINDING:

Communication equipment is difficult to use by control room personnel when they are wearing protective face masks. Though the masks are provided with voice diaphragms, the speech intelligibility is not sufficient to effectively communicate via the different communication systems.

RESPONSE:

Appropriate additional communication gear will be provided if available. Either an electronic microphone which has sufficient voice intelligibility for each protective mask, or replacement masks that are equipped with a voice diaphragm or electronic speech system that provides sufficient voice intelligibility will be used.

IMPLEMENTATION:

By completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0231

12 HED NO.: 2.2.1.B-1

CATEGORY: 2 LEVEL: C

FINDING:

There are 3 auditory horns used for the annunciator warning system on the main control panels. One is shared by panels 902-3 and 902-4 another for panel 902-5 and the third is shared between panels 902-6, 902-7, and 902-8. This does not provide localization cues to those work stations where operator attention is required.

RESPONSE:

The Dresden control room is small. The addition of auditory signals may add to the noise levels in the control room and may cause confusion to the operators.

IMPLEMENTATION:

Accept as is.

4425/c/7

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0106

12 HED NO.: 2.2.1.B-2

CATEGORY: 2 LEVEL: C

FINDING:

There is one auditory horn used for the annunciator warning system for panels 923-1 and 923-5.

RESPONSE:

The control room is small and allows the operators to make easy use of visual signals to direct their attention to the appropriate control panel.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

X NO.: 0232

12 HED NO.: 2.2.1.C.2-3

CATEGORY: 2 LEVEL: C

FINDING:

The intensity of the auditory alarms is such that when they are activated, it is very difficult to hear other sounds in the control room and to communicate with other personnel in the control room.

RESPONSE:

The intensity of the auditory signals will be decreased, while maintaining them sufficiently above ambient background noise levels.

IMPLEMENTATION:

By completion of the second refueling outage.

4380c/pg5

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0233, 0237, 0108, 0191

12 HED NO.: 2.2.2.A-1 2.2.3.A.1
2.2.2.A-2 2.2.3.A.2

CATEGORY: 2 LEVEL: C

FINDING:

There are auditory horns on the main control panels and the common panels which have more than one meaning and they are not coded. There is one horn located on the 902-3 panel which can mean a problem on either panel 902-3 or 902-4. Another horn located on the 902-7 panel can mean a problem on panels 902-6, 902-7 or 902-8. The common panel 923-1 annunciator horn is shared with panel 923-5.

RESPONSE:

The control room is small enough to allow the operators to make easy use of visual signals to direct the operator's attention to the appropriate control panel and over time, the operators have learned to discriminate the variable signals emanating from horns.

IMPLEMENTATION:

Accept as is.

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0234

12 HED NO.: 2.2.4.A-1 2.2.4.A-2

CATEGORY: 2 LEVEL: C

FINDING:

The alarms used for the auditory signal associated with the annunciator system do not direct sound to the center of the primary operating area. The alarms are installed behind the panels and direct sound to those areas.

RESPONSE:

Though the sound is not directed towards the center of the primary operating area, the intensity of the alarms is such that they can be heard from all locations in the operating area.

IMPLEMENTATION:

As is.

4381/c/3/y

DRESDEN CORRECTIVE ACTIONS

WORK NO.: 0470

12 HED NO.: 2.2.6.C-1

CATEGORY: 2 LEVEL: C

FINDING:

The auditory signal for the annunciator system on panel 902-56 has an intensity which exceeds 90 dB(A).

RESPONSE:

The annunciator horn will be dampened to a level between 65 dB and 90 dB, and verified that it is readily discernable over ambient noise levels.

IMPLEMENTATION:

By completion of the second refueling outage.

4380c/pg3

SECTION 3
ANNUNCIATOR WARNING SYSTEMS

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0342

12 HED NO.: 3.1.2.C.1-5

CATEGORY: 2 LEVEL: B

FINDING:

There are annunciator alarms which have inputs from more than one plant parameter, however, print-out capability is not provided. These include area radiation temperature and HI/LO type alarms. If alarms have more than one parameter input, the print out capability can ensure that the operator receives the information to determine what caused the alarm. In addition, responses from the operator survey indicated that multiple input alarms on the 902-3 and 8 panels are confusing (see operator survey response D1-3C). Also, it was suggested in the survey that any alarm with HI/LO level or pressure should be split out into single inputs, particularly those associated with RBCCW and TBCCW. See operator survey responses C3-1C, C4-1B, C4-1C, and C4-1D. Photo Log (L-6)

RESPONSE:

The alarm printout capability will be reviewed during the development of the annunciator package. The annunciator system will be examined to ensure the printing of specific alarms for all multi-input alarms. In addition, a general human factors review of the annunciators will be undertaken and appropriate corrective actions will be incorporated in an annunciator design change package.

IMPLEMENTATION:

By completion of the second refueling outage.

4421/c/49

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0395

12 HED NO.: 3.1.2.C.2-10

CATEGORY: 2 LEVEL: C

FINDING:

Printout speed for the multi-input alarms is not fast enough.

RESPONSE:

The rate at which printing takes place is essentially the same as which computer output is sent to the printer. While this rate is slower than the recommended 150 lines per minute, no information is lost in the interface between the two devices. In addition, information to be printed is stored in file until printing is completed.

IMPLEMENTATION:

As is.

4421/c/41

DRESDEN CORRECTIVE ACTIONS

X NO.: 0343

12 HED NO.: 3.1.2.C.3-7

CATEGORY: 2 LEVEL: B

FINDING:

For alarms with inputs from more than one parameter, a reflash capability is not provided which allows subsequent alarms to activate the auditory alert. Subsequent alarms cannot activate the auditory alarms until the current alarm has cleared.

RESPONSE:

A reflash capability will be designed and added to the annunciator system. This will allow all subsequent alarms to activate the auditory alarms.

IMPLEMENTATION:

By the completion of the second refueling outage.

4421/c/50

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0345

12 HED NO.: 3.1.2.D.1-9

CATEGORY: 1 LEVEL: B

FINDING:

The 2/3 Diesel generator is shared by both Units 2 and 3 however, the alarms associated with it are provided only on Unit 2. This includes all alarms except "Diesel Gen. 2/3 Breaker Withdrawn Position" which is located on Panels 902-7 and 903-7.

RESPONSE:

The center desk operator is responsible for monitoring the 2/3 diesel generator and as such has adequate capability to monitor this function.

IMPLEMENTATION:

As is.

4421/c/65

DRESDEN CORRECTIVE ACTIONS

WORK NO.: 0338

12 HED NO.: 3.1.3.B-2

CATEGORY: 2 LEVEL: C

FINDING:

There is no first out annunciator panel for the turbine-generator. The first-out panel should consist of separate tiles for each of the turbine generator trip functions.

RESPONSE:

This is not a significant problem. If the turbine generator trips, a series of annunciator tiles flash in alarm. Simultaneously, the printer records the specific nature of the alarm. Operators can refer to the printer to assess the problem and take corrective actions.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0339

12 HED NO.: 3.1.4.A-1

CATEGORY: 2 LEVEL: C

FINDING:

The annunciator system is not prioritized to differentiate the seriousness of alarms. A first out alarm feature exists for reactor trip, but this covers only one annunciator board.

RESPONSE:

A comprehensive annunciator review package will address the issue of prioritization.

IMPLEMENTATION:

By the completion of the second refueling outage.

4402/c/28

DRESDEN CORRECTIVE ACTIONS

WORK NO.: 0281

12 HED NO.: 3.1.5.A-1

CATEGORY: 2 LEVEL: C

FINDING:

There is no auditory or visual signal which indicates that an alarm has cleared. At present, the operator has to periodically activate the reset control to find out which alarms have cleared.

RESPONSE:

A reflash modification will be implemented on Unit 3 and if compatible will be implemented on Unit 2.

IMPLEMENTATION:

By completion of the second refueling outage.

4397/c/45

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0440

12 HED NO.: 3.2.1.E-3

CATEGORY: 2 LEVEL: C

FINDING:

The auditory horn mechanism for the annunciator system does not automatically reset when it is silenced. The silence button will silence the horn, however, it is not reset until the acknowledge button is pressed.

RESPONSE:

Administratively, the operator is required to go to the appropriate panel, acknowledge the alarm and take appropriate action.

IMPLEMENTATION:

As is.

4421/c/51

DRESDEN CORRECTIVE ACTIONS

● X NO.: 0344

12 HED: 3.2.1.F-1

CATEGORY: 2 LEVEL: C

FINDING:

There are no separate auditory signals at each panel. There are three auditory signals on the main control panels as follows: one for panels 902-3 and 902-4; one for panel 902-5; and one for panels 902-6, 902-7, and 902-8. Separate panel auditory signals would alert the operator as to the explicit location of any problem.

RESPONSE:

Although separate auditory signals are recommended to aid the operator in determining the location of a problem, human perceptual capabilities are limited in the recognition of different auditory alerts. The current number of alerts is about the maximum desirable; additional alerts could confuse, rather than help the operator.

IMPLEMENTATION:

Ac ● as is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0481, 0221

12 HED: 3.3.1.A-5, 3.3.1.A-6

CATEGORY: 1 LEVEL: C

FINDING:

The annunciator tiles cited should be on the 923-5 panel. There is currently no room on the 923-5 annunciator grid for them.

902-3	A-03-902-3	RX BLD VENT CH B HI HI RADIATION
	C-01-902-3	NEW FUEL STORAGE HI RADIATION
	C-02-902-3	OFF GAS HI HI RADIATION
	E-01-902-3	RADWASTE BLD HI RADIATION
	E-03-902-3	X-AREA UNIT COOLER TRIP
	A-12-902-3	HP CI COND STORAGE TANK LOW LOW LEVEL
	B-16-902-3	RX BLD VENT CH A OR B HIGH RADIATION
	C-16-902-3	RX BLD FUEL POOL CH A HI RADIATION
	E-16-902-3	RX BLD FUEL POOL CH B HIGH RADIATION
	F-14-902-3	RX BLD VENT CH A HI HI RADIATION
902-4	A-18-902-4	SUP POOL BULK TEMP HI DIV 1
	B-18-902-4	SUP POOL BULK TEMP HI DIV 1
	C-18-902-4	SUP POOL BULK TEMP HI DIV II
	C-22-902-4	NARROW RANGE TORUS WATER HIGH LEVEL
	C-23-902-4	NARROW RANGE TORUS WATER LOW LEVEL
	D-18-902-4	SUP POOL BULK TEMP HI DIV II
	E-23-902-4	TORUS WATER HIGH TEMP
	F-17-902-4	RX BLD EQUIP DRN TK HIGH LEVEL
	F-21-902-4	CRD DISCH VOL LEVE HI HI
	G-21-902-4	CRD DISCH VOL LEVEL HI
	H-21-902-4	CRD DISCH VOL LEVEL TROUBLE

RESPONSE:

An annunciator review package will be prepared to review the problems involved with positioning, technical content and wording of annunciator tiles. As a result of the package, all appropriate adjustments will be made.

IMPLEMENTATION:

By the completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0282

12 WED NO.: 3.3.1.B.1-1

CATEGORY: 2 LEVEL: C

FINDING:

The annunciator panels do not have labels that identify which alarms they contain.

RESPONSE:

The control panels are properly labeled. The annunciator panels referenced to a specific labeled control panel. There is no need to label annunciator panels.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0320

12 HED: 3.3.1.C.1-3

CATEGORY: 2 LEVEL: C

FINDING:

There are no provisions (documented) that ensure that when the tile is removed to replace the bulb, it is replaced in the correct location.

RESPONSE:

The alarm response procedure identifies the annunciator wording and the coordinates of the tile. If there is confusion on the tile location, annunciator procedures are usually checked when alarms sound. If they do not agree with the procedures, the problem is investigated.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0354

12 HED: 3.3.2.B 1

CATEGORY: 2 LEVEL: C

FINDING:

The flash rate for annunciator alarms on panels 902-3, 902-4, 902-5, 902-6, 902-7, and 902-8 is approximately 1.5 flashes per second, and on panels 902-54, 902-55, and 902-56 is approximately 1 flash per second.

RESPONSE:

The flash rates will be adjusted to 3-5 flashes per second to conform with the checklist guidelines. This will be done as part of the annunciator re-flash modification described in HED 0343.

IMPLEMENTATION:

By completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0340

12 HED NO.: 3.3.3.B-7

CATEGORY: 2 LEVEL: C

FINDING:

There are some alarm tiles that are not grouped together by function or systems. Examples are alarms associated with LPCI and HPCI.

RESPONSE:

The alarms associated with the HPCI are grouped together, however, there are other alarms within these alarms. The alarms associated with LPCI are all contained within one annunciator.

IMPLEMENTATION:

Accept as is.

4380c/pg2

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0286

12 HED NO.: 3.3.3.C.1-4

CATEGORY: 2 LEVEL: C

FINDING:

There is no designator grid coordinate label on the seventh row of the vertical axes on the annunciator panel. A letter "G" should be affixed to this coordinate position to complete the designator grid coordinate system for the annunciator system.

RESPONSE:

A letter "G" will be placed on the vertical axis, seventh row for the annunciator grid system. This letter "G" will be a plate-label consistent with the style, letter height, etc., of the other annunciator coordinate grid labels.

IMPLEMENTATION:

Be the completion of the second refueling outage.

4421/c/54

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0283

12 HED: 3.3.3.C.3-1

CATEGORY: 2 LEVEL: C

FINDING:

The letter height of the annunciator panel coordinate designators do not subtend a minimum visual angle of 12 minutes. Based upon a viewing distance of 20 feet from a central position the letter height should be .85 inches to subtend an angle of 12 minutes. The actual measurements are .65 inches which subtend an angle of 9.3 minutes. Proper letter height can ensure accurate and quick readability of the coordinate designators.

RESPONSE:

The annunciator coordinate designators can be effectively read from the operators normal work area. However, they will be examined further as a function of the control room labeling program.

IMPLEMENTATION:

by the completion of the second refueling outage.

4426/c/5

DRESDEN CORRECTIVE ACTIONS

X NO.: 0284

12 HED NO.: 3.3.3.D.1-3

CATEGORY: 2 LEVEL: C

FINDING:

The maximum number of alarms tile for the annunciator panel is 64, this exceeds the recommended maximum of 50 tiles per panel. The current panels are an 8 x 8 matrix.

RESPONSE:

To aid the operator in identifying individual tiles, the annunciators with 8 x 8 matrices will have vertical axes designators on both right and left sides of the panel.

IMPLEMENTATION:

By completion of the second refueling outage.

4421/c/35

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0321

12 HED: 3.3.3.E-5

CATEGORY: 2 LEVEL: C

FINDING:

The design of the annunciator system does not include a method to identify out of service alarms. When an alarm is out of service a yellow caution sticker is placed in the corner of the tile to indicate to the operator that it is out of service. (Photo Log L-4.)

RESPONSE:

Caution sticker indicates to operator that alarm is unreliable. Caution tag refers operator to specific work request for details. Auditory signaling is not necessary. Alarm either alarms continuously or not at all. Only investigation into alarm will provide information that alarm is not valid. Caution tag is as effective as any other color coding technique.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0322

12 HED: 3.3.4.A-1

CATEGORY: 2 LEVEL: A

FINDING:

The legends on some annunciator alarm tiles are ambiguous and/or confusing. The words on the alarm tile do not accurately indicate what the problem is. By having the legend on the tile specified unambiguous can ensure quick and accurate response to the alarms. This is a particular problem mentioned in an operator survey response for alarm F5 on the 902 (3)-4 panels: on 902-4 the tile reads "Recirc. MG A/B control cabinet hi temp". On the 903-4 panel the tile reads "Recirc. MG set A/B ex. air hi temp." Photo Log No. L-8

RESPONSE:

The legend on the alarm tiles will be reworded so they are clear and unambiguous.

IMPLEMENTATION:

By the completion of the second refueling outage.

4426/c/8

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0329

12 HED: 3.3.5.A.1-6

CATEGORY: 2 LEVEL: C

FINDING:

The letter height on the annunciator tiles do not subtend a visual angle of 12 minutes of arc, based on a calculated max. viewing distance of 8 ft. This distance is based on the distance between the first out panel and associated controls on panel 902-5. (Photo Log L-13)

RESPONSE:

Annunciator tiles will be re-labeled, applying appropriate human engineering principles as a function of the annunciator section of the labeling package.

IMPLEMENTATION:

By completion of the second refueling outage.

4426/c/18

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0330

12 HED NO.: 3.3.5.A.2-7

CATEGORY: 2 LEVEL: C

FINDING:

Letter heights are not identical (consistent) for all alarm tiles in the primary control room. Letter heights may vary from 0.11 to 0.29 inches.

RESPONSE:

Annunciator tile legends will be re-labeled, applying appropriate human engineering principles as a function of the labeling package, annunciator station.

IMPLEMENTATION:

By completion of the second refueling outage.

4421/c/7

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0285

12 HED NO.: 3.3.5.B.2-1

CATEGORY: 2 LEVEL: C

FINDING:

Type styles of letters on annunciator tiles are not consistent in the main control room. Some use tall thin letters, while others use short thick letters.

RESPONSE:

Annunciator tile legends will be re-labeled, applying appropriate human engineering principles as a function of the annunciator portion of the fueling package.

IMPLEMENTATION:

Completion of the second refueling outage.

4421/c/6

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0331

12 HED NO.: 3.3.5.B.3-9

CATEGORY: 2 LEVEL: C

FINDING:

Legends on annunciator alarm tiles use lower-case letters. Only upper-case letters should be used, as they subtend a larger visual angle, and are easier to read.

RESPONSE:

Annunciator tile legends will be re-labeled, applying appropriate human engineering principles as a function of the labeling package.

IMPLEMENTATION:

By completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

IN NO.: 0287

12 HED NO.: 3.3.5.C.1-3

CATEGORY: 2 LEVEL: C

FINDING:

Some alarm tiles have the labeling etched on in ink and often this lettering has been rubbed off, and is not always readable. The letters should be engraved on the tile face.

RESPONSE:

Annunciator tile legends will be re-labeled, applying appropriate human engineering principles as a function of the annunciator review program.

IMPLEMENTATION:

By completion of the second refueling outage.

4421/c/4

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0288

12 HED NO.: 3.3.5.C.2-5

CATEGORY: 2 LEVEL: C

FINDING:

The word "Trouble" on annunciator alarm A-10 on panel 903-8 is a dyno-tape label. The lettering is white on a red background. Guidelines suggest that dark lettering be used on a white (light) background. This tile should be re-labeled to conform to accepted guidelines and human factors principles.

RESPONSE:

Annunciator tile legends will be re-labeled, applying appropriate human engineering principles.

IMPLEMENTATION:

By completion of the second refueling outage.

4421/c/3

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0332

12 HED NO.: 3.3.5.D.1-11

CATEGORY: 2 LEVEL: C

FINDING:

The stroke-width-to-character height ratio for characters on alarm tiles is not between 1:6 and 1:8. Based upon the minimum height .33 inches the stroke width should be between .041 and .06 inches. The actual stroke widths measured range from .02 inches to .08 inches. By having adequate stroke widths ensures proper character size and can increase readability of the characters. (Photo log No. L-16).

RESPONSE:

The existing tiles will be replaced with tiles which have stroke widths between .04 and .06 inches as a function of a systematic annunciator retrofit.

IMPLEMENTATION:

by the completion of the second refueling outage.

4425/c/1

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0333, 0334, 0335

12 HED NO.: 3.3.5.D.2-13, D.3-15, D.4-17

CATEGORY: 2 LEVEL: C

FINDING:

The letter and numeral width-to-height ratio for characters on alarm tiles is not between 3:5 and 1:1 and the space between character is below the minimum recommended. Based upon the minimum height .33 inches the letter width should be between .20 and .33 inches. The actual letter widths measured range from .07 inches to .26 inches with only 9 out of 30 being above .20 inches. (Photo log No. L-17).

RESPONSE:

The alarm tiles will be re-engraved to adhere to human factors principals for letter width-to-height ratios spacing as a function of the control room wide annunciator program.

IMPLEMENTATION:

by the completion of the second refueling outage.

4425/c/2

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0336

12 HED NO.: 3.3.5.D.5-19

CATEGORY: 2 LEVEL: C

FINDING:

The space between words on some annunciator alarm tiles is below the accepted guideline minimum.

RESPONSE:

Annunciator tile legends will be re-labeled, applying appropriate human engineering principles. Refer to the labeling package, annunciator section.

IMPLEMENTATION:

By completion of the second refueling outage.

4421/c/11

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0337

12 HED NO.: 3.3.5.D.6-21

CATEGORY: 2 LEVEL: C

FINDING:

The spacing between lines of legend writing on some annunciator alarm tiles is below the accepted guideline minimum.

RESPONSE:

Annunciator tile legends will be re-labeled, applying appropriate human engineering principles.

IMPLEMENTATION:

By completion of the second refueling outage.

4417/c/10

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0276/0128/0277

12 HED NO.: 3.4.1.A.1-1/-2/2-3

CATEGORY: 2 LEVEL: C

FINDING:

A silence control is not included with the rest of the annunciator response controls on the following panels: 902-54, 902-55, 902-56, 903-54, 903-55, 903-56.

RESPONSE:

Acknowledge buttons silence the alarms. Present design requires operator to respond to appropriate panel alarm.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0473

12 HED NO.: 3.4.1.D-5

CATEGORY: 2 LEVEL: B

FINDING:

The periodic testing of annunciators is not required by an administrative procedure.

RESPONSE:

An administrative procedure has been placed in effect to control the testing of annunciators.

IMPLEMENTATION:

Completed.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0278, 0130

12 HED: 3.4.2.A-1, -2

CATEGORY: 2 LEVEL: C

FINDING:

Repetitive groups of annunciator controls in the primary operating area and common panels are not arranged the same and one set is not in the same relative location as the other panels. By arranging the controls the same and placing them in the same relative area can ensure that the operator can quickly respond to an alarm and reduce the possibility of activating the wrong control. Photo Log No. L-18/L-19/L-20

RESPONSE:

Background shading will be used to distinguish annunciator controls from other instrumentation.

IMPLEMENTATION:

By the completion of the second refueling outage.

4426/c/4

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0369

12 HED NO.: 3.4.2.B.1-3

CATEGORY: 2 LEVEL: A

FINDING:

The annunciator controls are not coded by means of color coding, color shading, demarcation, or shape coding. (Photo Log L-21/L-18.)

RESPONSE:

Annunciator controls will be coded by shape so that they will be different than other controls on the panels. Also, the group of annunciator controls will be background shaded.

IMPLEMENTATION:

By the completion of the first refueling outage.

SECTION 4
CONTROLS

DRESDEN CORRECTIVE ACTIONS

WORK NO.: 0050/0038

12 HED NO.: 4.1.1.E.2-3/4.1.1.E.3-2

CATEGORY: 2 LEVEL: C

FINDING:

Controls on common panels appear to have internal looseness due to the loose coupling between the switch and handle shafts or actual switch shaft looseness. Tight control handles can provide positive tactual feedback to the operator that the correct control position is being selected and that the switch is functioning properly (Photo Log C-23 and I-5). This affects primarily controls related to the 138 KV system and J-handle controls on common panels. TR 81 138 KV OCB; OLB 352-110 Line 1207; TR 83 OCB; Transformer 83 Synch.

RESPONSE:

The controls that have been identified as having loose handles or shafts will be examined on a case by case basis to determine the proper corrective maintenance to solve the problem. These may require only tightening the screw holding the handle to the shaft.

IMPLEMENTATION:

By completion of second refueling outage.

4397/c/48

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0109

12 HED NO.: 4.1.1.E.3-1

CATEGORY: 1 LEVEL: C

FINDING:

Controls on the main control panels have internal looseness. (Photo log D-8).

RESPONSE:

The feeling of the position detent exceeds shaft play. There is no documented evidence that this has presented any problems. The looseness of the J-handle control is related to the coupler between switch shaft and the handle assembly. The control positions are easily selected, the looseness is minimal.

IMPLEMENTATION:

Accept as is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0061/0201

12 HED NO.: 4.1.2.A-1/4.1.2.B-7

CATEGORY: 1 LEVEL: A

FINDING:

A response on the operator survey indicated that controls on the 923-2 panel have been accidentally bumped and possibly activated. The panel is in a high traffic area and does not have guard rails. Controls on the panel, therefore, could be accidentally activated.

RESPONSE:

A guard rail is to be installed to prevent operators from inadvertently activating controls while leaning over the benchboard and to protect from being bumped by passers by.

IMPLEMENTATION:

By completion of the first refueling outage.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0162

12 HED NO.: 4.2.1-6

CATEGORY: 2 LEVEL: B

FINDING:

Several toggle switches have positions labeled "UP" which is actually located below the switch. This interferes with normal operator expectations. Photo Log(D-34)

RESPONSE:

The labeling and switch positions will be reversed/modified to comply with normal operator expectations.

IMPLEMENTATION:

By the completion of the second refueling outage.

4402/c/14

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 158/160/161

12 HED NO.: 4.2.1.A-2/4.2.1.A-6/4.2.1.A-5

CATEGORY: 1 LEVEL: C

FINDING:

Direction of control movement does not conform to population stereotypes (e.g., open to the right, close to the left). The movement of the identified controls is such that open is to the left and close is to the right. Photo Log (D-11, D-12, F-1))

RESPONSE:

The direction of movement of designated controls will be changed to conform to the stereotype; open to the right and close to the left.

IMPLEMENTATION:

By the completion of the second refueling outage.

4402/c/47

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0157

12 HED: 4.2.1.E-1

CATEGORY: 1 LEVEL: C

FINDING:

Direction of control movement does not conform to the population stereotype. Right control action designating an increase/raise in function, left control action designating a decrease/lower in function (Photo Log D-9). Motor Speed Changer; Motor Gear Unit; Motor Speed Changer; Motor Gear Unit.

RESPONSE:

The direction of movement of the designated controls will be changed to conform to the stereotype; increase/raise to the right, and decrease/lower to the left.

IMPLEMENTATION:

By completion of second refueling outage.

INDEX NO.: 0040/0043

ED: 4.2.2.F.3-2/4.2.2.F.3-3

CATEGORY: 2 LEVEL: C

FINDING:

The color of toggle switches on 923-5A do not contrast well against the panel where they are mounted. (Photo Log C-21)

The twelve toggles are dark silver colored against a gray background. All toggles are located on 2 vendor modules.

RESPONSE:

The silver colored toggle switch contrasts sufficiently against the gray background particularly since position location is involved as well as depth perception.

IMPLEMENTATION:

Accept as is.

43/17

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0139

12 HED NO.: 4.2.2.F.3-5

CATEGORY: 1 LEVEL: C

FINDING:

The color of the control knobs does not contrast with the color of the panel background. Black on black provides very low contrast for identifying controls. Photo Log (F-4)

RESPONSE:

Although the control knob is black and the panel background is black, they are of different hues and saturation. In addition, depth, size and shading cues are available for these controls located on the back panels.

IMPLEMENTATION:

Accepted as is.

4397/c/66

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0142

12 HED NO.: 4.3.1.C-2

CATEGORY: 2 LEVEL: C

FINDING:

Pushbutton surfaces are smooth and convex where finger contact is made. Pushbutton should be slip-resistant and concave (Photo Log K-7).

RESPONSE:

Pushbutton surface has minimal impact in its operation. No significant force is necessary to operate the control. The plastic coverings do have slip resistant qualities.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0110

12 HED NO.: 4.3.2.A.1-1

CATEGORY: 2 LEVEL: C

FINDING:

The diameter of fingertip operation pushbuttons is less than the minimum diameter required (Photo Log K-11).

RESPONSE:

Size of pushbutton has minimal impact on its operation. No significant force is necessary for its operation.

IMPLEMENTATION:

Accept as is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0111

12 HED NO.: 4.3.2.A.1-2

CATEGORY: 2 LEVEL: C

FINDING:

The diameter of fingertip operated pushbuttons is less than the minimum required diameter (Photo Log F-16).

RESPONSE:

The above are "zero test" pushbuttons on control modules which are themselves non critical and infrequently used. The size of the pushbuttons has minimal effect on its operation.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0144

12 HED: 4.3.2.A.1-4

CATEGORY: 2 LEVEL: C

FINDING:

Unguarded and non-recessed pushbuttons for fingertip operation are less than the recommended diameter of .375". (Photo Log F-7)

RESPONSE:

Size of pushbutton has minimal impact on the its operation. No significant force is necessary to operate the control.

IMPLEMENTATION:

As is.

4385/c/8

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0041

12 HED NO.: 4.3.2.A.2-3

CATEGORY: 2 LEVEL: C

FINDING:

Ten recessed pushbuttons on the Dresden Lake Lift Station Panel are below the minimum diameter specification of .75" (Photo Log C-27).

RESPONSE:

The diameter of the recessed "area" is greater than .75" and is large enough to operate without impacting performance.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0204

12 HED NO.: 4.3.2.D-5

CATEGORY: 1 LEVEL: 6

FINDING:

The resistance of the guarded pushbuttons exceed the guideline limit of 40oz. Several of those tested exceed 80oz. (off scale).

RESPONSE:

The same style of guarded pushbuttons is used throughout the control room. There is no difficulty in actuating these pushbuttons and no mention of any difficulty in the operator survey.

IMPLEMENTATION:

As is.

4471/c/56

DRESDEN CORRECTIVE ACTIONS

1. WORK NO.: 0205 _____

12 HED NO.: 4.3.2.D-7 _____

CATEGORY: 2 LEVEL: C _____

FINDING:

The resistance of the "auto start" pushbutton on the tip drive controls is greater than the guideline of 40 oz.

RESPONSE:

This pushbutton is rarely used. It is used only for maintenance.

IMPLEMENTATION:

Accept as is.

4380/c/78

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0206

12 HED NO.: 4.3.2.D-8

CATEGORY: 2 LEVEL: C

FINDING:

The four fingertip pushbuttons on the controller (CRD temp recorder control) require only 8 oz. of force to activate, which is below the 10 oz. minimum.

RESPONSE:

The above pushbuttons are used only for monitoring, and are not critical to the operators. The impact of inadvertent activation is minimal.

IMPLEMENTATION:

Accept as is.

4380/c/80

DRESDEN CORRECTIVE ACTIONS

WORK NO.: 0207

12 HED NO.: 4.3.2.D-9

CATEGORY: 1 LEVEL: C

FINDING:

The "INOP INHIBIT" fingertip pushbutton on all of the channels requires only 8 oz. of force to be activated which is less than the 10 oz. minimum.

RESPONSE:

The above pushbuttons are used only during surveillance, prior to start up. Inadvertent activation would have minimal operational impact.

IMPLEMENTATION:

Accept as is.

4380/c/79

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0112/0328

12 HED NO.: 4.3.3.A-1/5.3.3.C-8

CATEGORY: 2 LEVEL: C

FINDING:

Legend pushbuttons are not distinguishable from legend indicator lights. Equipment with control function should be readily identifiable (Photo Log D-22 and M-5). EGC; IRM; IRM; Rod Worth Minimizer; SRM; CRD System (CR Selects); SRM Detector Drive Cont; IRM Detector Drive Cont; Turbine Controls; SRM; CRD Selects; SRM Detect Drive Cont; IRM Detect Drive Cont; EHC System; Trip-Tripped; Load Limit-Load Limit Limiting; Condenser Vacuum Trip-Tripped; Condenser Vacuum Trip-Vacuum Normal; Condenser Vacuum Trip-Resetting; Condenser Vacuum Trip-Reset; Condenser Vacuum Trip-Vacuum Low; Hydraulic Fluid Press; Electrical Malfunction/PMG Power Malfunction; "A" in Control; "B" in Control; Overspeed Trip System/Lock Out Valve-Norm; Overspeed Trip System/Emergency Governor Trip; Overspeed Trip System/Emergency Governor-Resetting; Reset-Reset; Circuit Breaker Closed; Speed Status-At Set Speed; Bypass Valve Opening Jack Selector-Open; Bypass Valve Opening Jack Selector-Closed; Speed Status-Increase Speed; EAC System; Trip-Tripped; Load Limit-Load Limit Limiting; Condenser Vacuum Trip-Tripped; Condenser Vacuum Trip-Vacuum Normal; Condenser Vacuum Trip-Resetting; Condenser Vacuum Trip-Reset; Condenser Vacuum Trip-Vacuum Low; Hydraulic Fluid Press; Electrical Malfunction/PMG Power Malfunction; "A" in Control; "B" in Control; Overspeed Trip System Status/Lockout Valve Normal; Overspeed Trip System Status/Emergency Governor Trip; Overspeed Trip System Status/Emergency Governor-Reset; Reset-Reset; Circuit Breaks Closed; Speed Status-Increase Speed; Speed Status-At Set Speed; Bypass Valve Opening Jack Selector-Open; Bypass Valve Opening Jack Selector-Closed.

RESPONSE:

Arrays that present a mixture of legend lights and pushbuttons will be coded to indicate which are pushbuttons. A coding convention such as a colored dot or border on pushbuttons will be developed and implemented.

IMPLEMENTATION:

By the completion of the second refueling outage.

4397/c/51

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0113

12 HED: 4.3.3.B.1-2

CATEGORY: 2 LEVEL: C

FINDING:

Legends are not readable under ambient lighting conditions. Applicable only to those legends which are color coded red. (Photo Log D-16)

RESPONSE:

The red color and green color filaments of the following legends will be replaced with a color which enhances the legend: on panel 902-7, EP 03-7-13L, 03-7-15, 03-7-16A, 03-7-17B, 03-7-19C, 03-7-19F, 03-7-20, 03-7-21B, 03-7-3A, and on panel 903-7: 02-7-13C, 02-7-15, 02-7-16A, 02-7-17B, 02-7-19C, 02-7-19F, 02-7-20, 02-7-21B, 02-7-3A.

IMPLEMENTATION:

By completion of the second refueling outage.

4385/c/1

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0447

12 HED: 4.3.3.B.3-14

CATEGORY: 1 LEVEL: C

FINDING:

Characters on legend pushbuttons do not subtend 15 min. of visual arc at a viewing distance of 3ft.

RESPONSE:

During normal operations, viewing distance is within 34 inches of the legends. At that distance, characters will subtend at least 15 min. of visual arc. Legends on legend pushbuttons become crucial during accuation, at that time the operator is close enough to easily read the legends. At a distance of over three feet status of the pushbutton legend light and the color of the pushbutton become the primary identifiers.

IMPLEMENTATION:

As is.

4385/c/2

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0115/327/0114

12 HED NO.: 4.3.3.B.5-4/5-7/5-3

CATEGORY: 2 LEVEL: C

FINDING:

Legends on legend lights contain more than three lines of text and legend pushbuttons contain more than four lines of text. These exceed the guideline specification. Too much lettering on a small pushbutton or legend light becomes cluttered and difficult to read.

RESPONSE:

The visibility of the cited legend pushbuttons and legend lights is good, there is not clutter that makes reading the legends difficult. This is vendor supplied equipment.

IMPLEMENTATION:

Accept as is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0120

12 HED NO.: 4.3.3.D.1-9

CATEGORY: 2 LEVEL: C

FINDING:

Physical barriers are not used when legend pushbuttons are side by side. Such barriers guard against the accidental activation of an adjacent pushbutton. Photo Log(D-22)

RESPONSE:

There is no consequence to this deficiency. These turbine load switches are also related to thumbwheels that would minimize the effect of inadvertent actuation.

IMPLEMENTATION:

As is.

4397/c/52

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0121 _____

12 FED NO.: 4.3.3.D.1-10 _____

CATEGORY: 1 _____ LEVEL: C _____

FINDING:

Physical barriers are not used when legend pushbutton are side by side. Such barriers prevent against the accidental actuation of an adjacent pushbutton. Rod Worth Minimizer; Rod Select Matrix; Rod Worth Minimizer; Rod Select Matrix. Photo Log(D-25).

RESPONSE:

The cited switches require two steps to actuate; this minimizes the effect of any possible accidental actuation.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0122

12 HED: 4.3.3.E.1-11

CATEGORY: 1 LEVEL: C

FINDING:

The size of legend pushbuttons is below the minimum required size of .75".
(Photo Log D-24)

RESPONSE:

Size of pushbutton has minimal impact on its operation. No significant
force necessary to operate the control.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0123

12 HED NO.: 4.3.3.E.1-12

CATEGORY: 2 LEVEL: C

FINDING:

The size of the legend pushbuttons is below the minimum required size of .75" (Photo Log D-22).

RESPONSE:

Size of the pushbutton has minimal impact on its operation. No significant force necessary to operate the control.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0124

12 HED NO.: 4.3.3.E.5-13

CATEGORY: 2 LEVEL: C

FINDING:

Legend pushbuttons have a resistance greater than the recommended 40 oz. Resistance was measured at 48 oz. (Photo Log D-18).

RESPONSE:

Difference between actual resistance and recommended resistance is minimal, and has no impact on the ability to use the control.

IMPLEMENTATION:

Accept as is.

43800/pg28

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0211/0466

12 HED: 4.4.3.A-5/4.4.3.A-4

CATEGORY: 2 LEVEL: C

FINDING:

Key operated controls are used when system requirements do not dictate that they should be secured against unauthorized activation. This may cause unnecessary delays while obtaining the keys.

RESPONSE:

Inappropriate key locks will be replaced with a different control. This is currently under evaluation by engineering and operations.

IMPLEMENTATION:

By the completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0145

12 HED: 4.4.3.D-2

CATEGORY: 1 LEVEL: C

FINDING:

Key operated controls are not oriented where the vertical key position designates an "off" or "safe" position. The normal "monitor" mode is at the 10 o'clock position. (Photo Log D-20)

RESPONSE:

This is not time critical, and not a problem for the operators, as this operation is consistently used throughout panel 902-13.

IMPLEMENTATION:

As is.

4385/c/6

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0146

12 HED: 4.4.3.D-3

CATEGORY: 1 LEVEL: C

FINDING:

Key operated controls are not oriented where the vertical key position designates an "off" or "safe" position. The normal mode is at the 10 o'clock position. (Photo Log D-21)

RESPONSE:

This is not time critical, and not a problem for the operator, as this orientation is consistently used throughout panels 902 and 903.

IMPLEMENTATION:

As is.

4385/c/7

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0042

12 HED NO.: 4.4.3.F-1

CATEGORY: 2 LEVEL: C

FINDING:

Control positions for two key operated controls are not labelled. They are identified as "keyboard" without other function/control information. (Photo Log C-24)

RESPONSE:

For control position information will be provided for detented control position.

IMPLEMENTATION:

By the completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

X NO.: 0147/0126

12 HED: 4.4.4.B-4/4.4.4.B-2

CATEGORY: 1 LEVEL: C

FINDING:

On continuous adjustment rotary controls, the scale appears on the control knob skirt while the position indication is fixed on the panel. Instead the position indication should be on the control knob, and the scale should be affixed to the panel. (Photo Logs D-13, K-8)

RESPONSE:

While scale indication or knob skirts may be blocked by the operator's hand during use, the height of the control in relation to its diameter is great enough to preclude such blockage on these controls.

IMPLEMENTATION:

Accept as is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0127

12 HED: 4.4.4.C.1.A-3

CATEGORY: 1 LEVEL: C

FINDING:

Fingertip grasp rotary controls are less than the recommended height of .5".

RESPONSE:

No significant effort is necessary to operate the control.

IMPLEMENTATION:

Accept as is.

DRESDEN CORRECTIVE ACTIONS

WORK NO.: 0148

12 HED NO.: 4.4.4.C.1.A-5

CATEGORY: 1 LEVEL: C

FINDING:

On continuous adjustment rotary controls, the finger tip grasp knob height is less than the recommended .5 (minimum). The height for these controls was measured at .312". Photo Log (F-13)

RESPONSE:

The operation of these controls is not time critical and can be manipulated with ease. The operators have not reported any difficulty with operating these continuous adjustment rotary controls.

IMPLEMENTATION:

Accept as is.

44/55

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0149

12 FED NO.: 4.4.4.E.1-6

CATEGORY: 1 LEVEL: C

FINDING:

The continuous adjustment rotary controls with knob skirts have skirts which are 1.27" in diameter. This is below the recommended 2" diameter.

RESPONSE:

These knobs are alarm setpoints on the back panels whose use is not time critical. Operators have little difficulty in using the control.

IMPLEMENTATION:

Accept as is.

DRESDEN CORRECTIVE ACTIONS

INSTR NO.: 0174

12 HED: 4.4.4.E.2-7

CATEGORY: 1 LEVEL: C

FINDING:

The continuous adjustment rotary controls with knob skirts have skirt heights of .125". This is below the recommended height of .25" (Photo Log I-7).

RESPONSE:

These knobs are alarm setpoints on the back panels whose use is not time critical. Operators have little difficulty using these controls.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0175

12 HED: 4.4.4.E.4-8

CATEGORY: 1 LEVEL: C

FINDING:

The continuous adjustment rotary controls with knob skirts have knob heights of .5". This is below the recommended height of .75" (Photo Log I-8).

RESPONSE:

These knobs are alarm setpoints on the back panels whose use is not time critical. Operators have little difficulty using these controls.

IMPLEMENTATION:

As is.

438cc/pg36

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0176

12 HFD NO.: 4.4.4.E.5-9

CATEGORY: 1 LEVEL: C

FINDING:

The continuous adjustment rotary controls with knob skirts have knob diameters of .57". This is below the recommended diameter of .75".

RESPONSE:

These knobs are alarm setpoints on the back panels where use is not time critical. Operators have little difficulty operating these controls.

IMPLEMENTATION:

Accept as is.

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0180

12 HED NO.: 4.4.5.B.4-13/4.4.5.B.4-15

CATEGORY: 2 LEVEL: C

FINDING:

There are no stops provided at the end of the selector range. This may result in an appropriate positioning of the control. Control panel 902-8 - EPN 2700 V; 903-8 - EPN 3700 V (Photo Log J-5).

RESPONSE:

For these controls the position which is beyond the labeled control positions was originally a control position. Its label has been taped on and when the control is positioned there, it has the same effect as the off position. According to the operator, these controls are rarely used.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0181

12 HED NO.: 4.4.5.B.4-14

CATEGORY: 2 LEVEL: B

FINDING:

The channel selector is not used and there are no stops to prevent its use. (Photo Log J-6)

RESPONSE:

Procedures governs its use. Also, this control is used for calibration and is only used infrequently by the operator.

IMPLEMENTATION:

As is.

4430/c/23

DRESDEN CORRECTIVE ACTIONS

INSTR NO.: 0150

12 HED NO.: 4.4.5.D.2-6/4.4.5.D.2-7

CATEGORY: 2 LEVEL: C

FINDING:

Pointers on knobs are not mounted close to the settings to which they point. Cylindrical knobs have white dots on the outer flat knob surface, .75" from position settings.

RESPONSE:

This has not been reported as a problem. The controls are non-critical.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

WORK NO.: 0152

12 HED NO.: 4.4.5.E.1-8

CATEGORY: 1 LEVEL: C

FINDING:

Teardrop shaped knobs on rotary selector switches are below the recommended length of 1"; they are .75". (Photo Log F-6)

RESPONSE:

Although the controls do not meet the specified criteria, the control design is adequate for the operator to activate the control with accuracy.

IMPLEMENTATION:

Accept as is.

4300c/pg17

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0153

12 HED NO.: 4.4.5.E.3-9

4.4.5.E.3-10

4.4.5.E.3-11

CATEGORY: 2 LEVEL: C

FINDING:

The diameters of thirty rotary selector switches are below the recommended diameter of 1". A diameter of .25" was measured on the following: Panel 902-13: EPN 02-13-2, 02-13-3, 02-13-6, 02-13-7, 02-13-8; Panel 903-13: EPN 03-13-2, 03-13-3, 03-13-6, 03-13-7, 03-13-8. A diameter of .5" was measured on the following; Panel 902-37: EPN 02-37-11, 02-37-12, 02-37-13, 02-37-14, 02-37-2, 02-37-3, 02-37-5, 02-37-6, 02-37-8, 02-37-9; Panel 903-37: EPN 03-37-11, 03-37-12, 03-37-13, 03-37-14, 03-37-15, 03-37-02, 03-37-03, 03-37-05, 03-37-06, 03-37-08, 03-37-9. A diameter of .75" was measured on the following; Panel 902-10: 02-10-14, 02-10-2; Panel 902-11: 02-11-15, 02-11-36, 02-11-4; Panel 903-10: 03-10-14, 03-10-2; Panel 903-11: 03-11-15, 03-11-36, 03-11-36, 03-11-4.

RESPONSE:

There is no impact on the successful operation of the console due to diameter size (Photo Log F-2, F-5, K-9).

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

NO. : 0129

12 HED: 4.4.5.E.4-2

CATEGORY: 1 LEVEL: C

FINDING:

All thumbster type rotary selector switch finger group heights are below the recommended height of .625" (Photo Log K-13).

RESPONSE:

None of these controls are modulated; they don't require holding.

IMPLEMENTATION:

Accept as is.

43 /pa34

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0047

12 HED: 4.4.5.E.4-12

CATEGORY: 2 LEVEL: C

FINDING:

The height of rotary selector switch handles on common panels is below the recommended height of .625". The heights were found at .312".
Photo Log(C-25)

RESPONSE:

These are thumb buster switches and can be operated without difficulty.

IMPLEMENTATION:

Accept as is.

4355c/pg20

DRESDEN CORRECTIVE ACTIONS

WORK NO.: 0130/0131

12 HED NO.: 4.4.5.F-3/4.4.5.F-4

CATEGORY: 2 LEVEL: C

FINDING:

Momentary contact rotary selector controls may be difficult to hold against the spring torque for as long as necessary to accomplish the control action. The controls are located on the vertical section of panel 902-6 and on panels 902-7 and 903-7. Operators use a switch handle with a larger finger area to operate these controls. One per unit is used to operate the 50 identified controls. All controls are located on the vertical section of 902-6, 902-7 and 903-7 (Photo Log D-31 and D-30). Vent Controls; Drain Controls; Main Stm Line Drain Valve; Stop Valve; Drain Valve.

RESPONSE:

These deficiencies will be corrected with the appropriate action for the particular control. The controls on panel 902-6 will be changed to seal in valves so they will not have to be held in position. The control switches on panels 902-7 and 903-7 will be changed to a control handle that can be held easily against the spring torque.

IMPLEMENTATION:

By completion of the second refueling outage.

4397/c/54

DRESDEN CORRECTIVE ACTIONS

INSTR NO.: 0132 _____

12 HED NO.: 4.5.1.C.2-1 _____

CATEGORY: 1 _____ LEVEL: C _____

FINDING:

The resistance of continuous adjustment thumbwheels is greater than the recommended 6 oz. resistance. Resistance for these controls was approximately 10 oz. (Photo Log D-32).

RESPONSE:

The measured resistance poses no problem for knob operation.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0133/0134/0135

12 HED NO.: 4.5.1.D.2.B-2/B-3/C-4

CATEGORY: 2 LEVEL: B

FINDING:

On discrete setting thumbwheel controls, the trough distance (see Exhibit 4-13 in survey) is below the minimum required distance of .45". Distances were found at .4". Photo Log (E-23)

RESPONSE:

These controls will be changed as a by-product of the rod worth minimizer redesign.

IMPLEMENTATION:

By the completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

I NO.: 0044

12 HED NO.: 4.5.1.D.2.B-6

CATEGORY: 3 LEVEL: C

FINDING:

The through distance of discrete setting thumbwheels is less than the minimum .45" required. Measured distance was .25". Photo Log (I-32/I-31).

RESPONSE:

The operators do not use this thumbwheel. It is used by the instrument mechanics to set alarm points for temperature of the SBGT.

IMPLEMENTATION:

As is.

4421/c/57

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0045

12 HED NO.: 4.5.1.D.2.C-7

CATEGORY: 2 LEVEL: C

FINDING:

The width of discrete setting thumbwheels Digital Temperature Alarms is less than the required .125". Width was measured at .062". (Photo Log I-33)

RESPONSE:

The operators do not use this thumbwheel. It is used by the instrument mechanics only.

IMPLEMENTATION:

As is.

4421/c/58

DRESDEN CORRECTIVE ACTIONS

I NO.: 0156

12 HED NO.: 4.5.2.B.2-1

CATEGORY: 2 LEVEL: C

FINDING:

The length of the slide switch on panel 902-21 is below the recommended 1". The length was .312" (Photo Log E-26).

RESPONSE:

The length of the slide switch will not affect operation of the switch.

IMPLEMENTATION:

As is.

4380c/pg21

DRESDEN CORRECTIVE ACTIONS

INSTR NO: 0137

12 HED NO.: 4.5.3.C.4-1

CATEGORY: 2 LEVEL: C

FINDING:

The resistance on large toggle switches exceeds the maximum recommended resistance of 40 ounces. A resistance of 48 ounces was found. Photo Log (F-19, E-25)

RESPONSE:

The resistance of 48 ounces, although exceeding the recommended resistance of 40 ounces, does not significantly influence the operation of the switch.

IMPLEMENTATION:

As is.

4424/c/19

SECTION 5
VISUAL DISPLAYS

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0419

12 HED NO.: 5.1.1.B.1-1

CATEGORY: 2 LEVEL: B

FINDING:

The displays are not identified as to whether they reflect demand or actual status. Knowing which is being reflected gives the operator a clearer understanding of the display. (Photo Log 0-5).

RESPONSE:

Identified displays are part of controllers. An identifier will be established to indicate to the operator when displays are indicating demand status and response. The best method to show operators the status that displays are indicating will be reviewed on a case by case basis to determine if the component label for the controller or a separate label for the controller display will be the appropriate indication.

IMPLEMENTATION:

By completion of second refueling outage.

4409/c/20

DRESDEN CORRECTIVE ACTIONS

Index #: 0439

12 GUIDE NO.: 5.1.1.C-2

CATEGORY: 1 LEVEL: B

FINDING:

When instruments fail or become inoperative the failure is not apparent to the operator. Being aware that an instrument has failed indicates to the operator that he/she must depend on other sources for the information.

There are 3 major groups of instruments based on the type of failure which they incur. They are listed below with a description of their failure characteristics.

1. Legend and non-legend indicator lights - There is no indication as to when they have failed other than that they do not respond as expected to known conditions.

2. Rotary and edgewise meters - Because of the way these meters are calibrated it is not possible to determine whether a 0 reading is a true 0 or if the meter has failed. It is also not possible to determine whether or not the meter has failed if it is reading off scale since this may occur in normal operating conditions.

3. Continuous and discrete recorders and LED's - With power loss, these instruments cease to function so that failure is obvious. Any other types of failure can only be detected by erroneous readings on the instruments which do not concur with other redundant or related instrumentation.

RESPONSE:

Most of the critical instrumentation has redundant information as well as alarms to indicate when the measured parameters are out of range. This allows the operator to detect instruments which may be giving erroneous readings so that he/she may have them checked by an instrument mechanic.

IMPLEMENTATION:

As is.

4424/c/20

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0415

12 HED NO.: 5.1.2.B-1

CATEGORY: 1 LEVEL: B

FINDING:

The values on several displays (meters), in particular response meters on controllers, are in units which require conversion or are not meaningful (i.e., percent on response meters). Photo Log(0-8)

RESPONSE:

The current display (meter) faces will be changed to provide meaningful information to the operator.

IMPLEMENTATION:

By the completion of second refueling outage.

DRESDEN CORRECTIVE ACTIONS

WORK NO.: 0210

12 HED NO.: 5.1.3.A-1

CATEGORY: 1 LEVEL: B

FINDING:

The height of numerals on displays does not subtend 15 min. of visual arc from a 3 foot viewing distance. (Photo Log J-23 J-24).

RESPONSE:

Each meter face will be reviewed to determine the extent of the problem. Design recommendations will be made and meter faces changed where appropriate.

IMPLEMENTATION:

By completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0211, 0212

12 HED: 5.1.3.A-3/5.1.3.A-4

CATEGORY: 1 LEVEL: C

FINDING:

Numerical exponents and alphabetical characters on displays do not subtend 12 min. of visual arc at a distance of 2#ft. The minimum required for good readability of characters is 12 min. of visual arc.
Photo Log(L-24)

RESPONSE:

This presents no operational problem. The guideline intent is to ensure that numerals on displays are visible at a normal viewing distance, but to increase the exponent numerals to the size specified would require the other numerals to be so large as to clutter the display. When an exact value is required, the numerals are visible. Alphabetical characters on displays usually denote units; these are often smaller than the specified guideline to avoid cluttering the display. The units can be read with no difficulty.

IMPLEMENTATION:

Accept as is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0213, 0092

12 HED NO.: 5.1.3.B.2-5, 5.1.3.B.2-6

CATEGORY: 1 LEVEL: C

FINDING:

The typestyles on display faces are not consistent. A common typestyle improves readability. (Photo Log J-26/J-27/J-28/J-29/J-30)

RESPONSE:

There are three common typestyles. GE displays employ two different typestyles and Westronics employs one. The display faces are easily read, this does not effect operator response.

IMPLEMENTATION:

Accept as is.

DRESDEN CORRECTIVE ACTIONS

INSTRUMENT NO.: 0213

12 HED NO.: 5.1.3.C.1-7

CATEGORY: 1 LEVEL: C

FINDING:

The displays do not have black lettering on a white background (Photo Log J-31).

RESPONSE:

The displays are an affiliate to dark gray but still allow for good contrast. The counters on panels 90X-4, 18 and 19 are white on black. The timers on panels 90X-10 and 18 are dark green on white and black on silver respectively. The characters on these displays are easily read.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

IDENTIFICATION NO.: 0216

12 HED NO.: 5.1.3.D.1-9

CATEGORY: 1 LEVEL: C

FINDING:

The stroke width to character height ratios are not between 1:6 and 1:8. These limits provide optimal readability of characters on a display. (Photo Log L-25)

RESPONSE:

The visibility of the characters on these displays is good, they can be read with little difficulty. This does not effect operator response.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0217

12 HED NO.: 5.1.3.D.2-11

CATEGORY: 1 LEVEL: C

FINDING:

Letter width to height ratios are not between 1:1 and 3:5. These limits provide for optimal readability of characters on displays. (Photo Log L-27)

RESPONSE:

The visibility of the characters on the displays is good, they can be read with no difficulty. This does not effect operator response.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0218

12 HED NO.: 5.1.3.D.3-13

CATEGORY: 1 LEVEL: C

FINDING:

The numeral height to width ratio for displays is not approximate 3:5.
(Photo Log L-26)

RESPONSE:

The visibility of the numerals on the displays is good, they can be read with little difficulty. This does not affect operator response.

IMPLEMENTATION:

As is.

4381c/pg20

DRESDEN CORRECTIVE ACTIONS

WORK NO.: 0219

12 HED NO.: 5.1.3.D.4-15

CATEGORY: 1 LEVEL: C

FINDING:

Minimum space between characters on displays is less than one stroke width. This limit provides for optimal readability of characters. (Photo Log L-27)

RESPONSE:

The visibility of the characters on the displays is good, they can be read with little difficulty. This does not effect operator response.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0220

12 HED NO.: 5.1.3.D.6-17

CATEGORY: 1 LEVEL: C

FINDING:

The space between lines on displays is less than one half the character height. This limit provides for optimal readability of the display wording. (Photo Log L-28)

RESPONSE:

The visibility of the display wording is good, it can be read with no difficulty. This does not effect operator response.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0230

12 HED NO.: 5.1.4.A-1

CATEGORY: 1 LEVEL: C

FINDING:

Several meters exist which do not have labels as to what is being measured. This information is needed to clearly define what the display is representing. Conductivity Reactor Demin; Pump Loop B Flow; Torus Pressure; Conductivity Reactor Demin; Pump A Off Press; N2 Purge Flow.

RESPONSE:

Labels will be made which have the appropriate information. These labels will be placed on either the meter face, or adjacent to the meter.

IMPLEMENTATION:

By the completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0456

12 HED NO.: 5.1.4.E-3

CATEGORY: 1 LEVEL: C

FINDING:

The nomenclature of printed messages is not consistent with the procedures for display identification, parameter identification, and units displayed. This may lead to confusion in the interpretation and use of the displays. Photo Log (D-8)

RESPONSE:

Standards for nomenclature will be established. The procedures and displays will then be changed to conform to the standards. Cross referencing guides will also be provided to ease understanding of the standardized nomenclature.

IMPLEMENTATION:

By completion of the second refueling outage.

4421/c/40

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0305

12 HED NO.: 5.1.5.A.1-1

CATEGORY: 1 LEVEL: B

FINDING:

More than 9 graduations were used between major numerals on displays. Having more than 9 graduations can make accurate reading of the display difficult. There are 114 displays affected by this INDEX. (Photo Log L-30)

RESPONSE:

Each of the displays mentioned will be reviewed and the scales will be checked where appropriate. The scales will be evaluated on the accuracy of reading required and their importance to safe plant operation.

IMPLEMENTATION:

By completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

WORK NO.: 0306

12 HED NO.: 5.1.5.A.3-3

CATEGORY: 1 LEVEL: C

FINDING:

Major and minor graduations on some display scales have five or more graduations (log scales).

RESPONSE:

Most of the discrepant items are log scales and the current graduations are appropriate for the measurements being taken with this equipment. High accuracy is not required from readings on these instruments.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0220

12 HED NO.: 5.1.5.B-6

CATEGORY: 1 LEVEL: C

FINDING:

The graduation heights on displays do not meet the specified guideline of .4" for major graduations, .28" for intermediate, and .17" for minor graduations at a viewing distance of 3 feet. These heights allow for the optimal visual angle at that distance so that the graduations can be easily and accurately read. (Photo Log L-33)

RESPONSE:

The guideline apparently transferred the visual angle equation from the reference (McCormick, 1975) incorrectly and the specified graduation sizes are too large. The display graduations are not difficult to read and almost every display failed to meet the specified guideline. Many of the displays would be in compliance with the guideline if calculated correctly from the reference.

IMPLEMENTATION:

Accept as is.

DRESDEN CORRECTIVE ACTIONS

NUMBER NO.: 0307

2 HED NO.: 5.1.5.C-4

CATEGORY: 1 LEVEL: C

FINDING:

Successive values indicated by unit graduations are not multiples of 1, 2, or 5 by some power of ten (Photo Log L-32).

RESPONSE:

The discrepant meters usually employ multiples of 3, 15, or 25 multiplied by a power of 10. The human factors principle behind this guideline is that simple numerical progressions are more easily recognized than complex progressions. The scales employed in the control room are not complex and are adequate for the level of accuracy required.

IMPLEMENTATION:

ce is.

.80c/pg9

DRESDEN CORRECTIVE ACTIONS

WORK NO.: 0417

12 HED NO.: 5.1.5.F-9

CATEGORY: 1 LEVEL: C

FINDING:

Multiple scale indications are being used. Multiple scales with a single pointer may cause confusion as to which scale is to be referenced at a given time (Photo Log 0-9).

RESPONSE:

Alternative design features to indicate which scale is to be referenced are being investigated. These include placement of an LED to indicate which scale is being displayed. Another alternative solution is to replace the multiscale meters with 2 single scale meters. The multiscale indicators will be reviewed on a case by case basis to determine the appropriate solution for each indicator.

IMPLEMENTATION:

By the completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0420/0021

12 HED NO.: 5.1.6.C.1-1/5.1.6.D.1-3

CATEGORY: 1 LEVEL: C

FINDING:

The meaning attached to particular colors is not specifically defined. Having distinct meanings for colors helps make them less ambiguous and less likely to be misinterpreted.

RESPONSE:

A color code standard for the control room will be developed.

IMPLEMENTATION:

By the completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0279

12 HED NO.: 5.1.6.D.1-1

CATEGORY: 1 LEVEL: A

FINDING:

The identification label for the Contaminated Fill Valve #1301-10 is green rather yellow as recommended in DVR corrective actions. This is an inconsistent use of color and may provide interference to effective control room operation under some conditions. (Photo Log No. M-10)

RESPONSE:

The label for the specified valves will be re-engraved on a background of a color consistent with the color coding scheme applied in the control room.

IMPLEMENTATION:

By completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

1 WORK NO.: 0423/0426

12 HED NO.: 5.1.6.D.2-5/5.1.6.D.3-7

CATEGORY: 2 LEVEL: C

FINDING:

The meaning of a particular color is not consistent throughout the control room, it has different meaning when applied to panel surfaces, signal lights and CRT displays. Color consistency helps proper interpretation of color.

RESPONSE:

A color code standard for the control room will be developed. The color standard will be applied throughout the control room.

IMPLEMENTATION:

By completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0309

12 HED NO.: 5.2.1.A-1

CATEGORY: 1 LEVEL: C

FINDING:

The scale values do not increase with the clockwise movement of the pointer. The relationship between clockwise movement and the concept of "increase" is a basic population stereotype.

RESPONSE:

These meters indicate periods (sec) which is a measure of the rate of change for power. It is an inverse measure of the rate of change of power, so that when power increases the value decreases. This meter is indicating an increase in power even though the numeric value of periods (sec) is decreasing. This is a standard used in GE BWR plants and to change it may be going against NSO populations stereotypes currently established.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0170, 0172, 0310

12 HED NO.: 5.2.2.A.2-1, 5.2.2.A.2-3
5.2.2.B.1-6

CATEGORY: 1 LEVEL: C

FINDING:

Pointer tips on scales are covering the scale graduations making scales difficult to read. This problem is primarily associated with GE strip-chart recorders. Photo log number I-9.

~~Condensate Conductivity; Turbine Speed and Valve Disposition; Condenser Vacuum; Stm Line Monitor; Proc Liquid Monitor; Off Gas Monitor-Log; React Bldg Vent Exhaust Mon; LPCI Flow; Makeup Flow SCFH/Dry Well Pres PSIG; Cleanup Flow and Pressure; Rad Waste System Flow; Recirc Loop Temps; Recirc Pump A/B Flow; Head to Flange Temperature; Core Pressure/Flow; Reactor Press Total Stm Flow; Turb Stm Flow Reactor Press; IRM-APRM; IRM-APRM/RBM; IRM-APRM/RBM; IRM-APRM; Source Range Monitor Level; H₂ Analyzer; Inlet Flow to Hold Up line; Gas Reheater Temp; Gamma Radiation; Gamma Radiation; Condensate Makeup; Ejector Off Gas Flow; Hotwell Temp; Condensate Conductivity; Turbine Speed and Valve Disposition; Condensator Vacuum; Stm Line Monitor; Proc Liquid Monitor; 066 Gas Monitor-Log; Reset Bldg Vent Exhaust Mon; LPCI Flow; Makeup Flow SCFH/Dry Well Pres PSIG; Cleanup Flow and Pressure; Rad Waste System Flow; Torus Water Temp; Recirc Loop Temps; Recirc Pump A/B Flow; Head to Flange Temperature; Core Pressure/Flow; Reactor Press Total Stm Flow; Turb Stm Flow Reactor Press; IRM-APRM; IRM-APRM/RBM; IRM-APRM/RBM; IRM/APRM; Source Range Monitor Level; H₂ Analyzer; Inlet Flow To Hold Up Line; Gas Reheater Temp; Gamma Radiation; Gamma Radiation; Condensate Makeup; Ejector Off Gas Flow; Hotwell Temp; Recirc Loop Temps; Recirc Pump A/B Flow; Head to Flange Temperature; Core Pressure/Flow; Reactor Press Total Stm Flow; Turb Stm Flow Reactor Press; IRM-APRM; IRM-APRM/RBM; IRM-APRM/RBM; IRM/APRM; Source Range Monitor Level; H₂ Analyzer; Inlet Flow to Hold Up Line; Gas Reheater Temp; Gamma Radiation; Gamma Radiation; Condensate Makeup; Ejector Off Gas Flow; Hotwell Temp; Stm Line Monitor; Proc Liquid Monitor; Off Gas Monitor-Log; React Bldg Vent Exhaust Mon; LPCI Flow; Makeup Flow SCFH/Dry Well Pres PSIG; Cleanup Flow and Pressure; Rad Waste System Flow; Recirc Loop Temps; Recirc Pump A/B Flow; Head to Flange Temperature; Core Pressure/Flow; Reactor Press Total Stm Flow; Turb Stm Flow Reactor Press; IRM-APRM; IRM-APRM/RBM; IRM-APRM/RBM; IRM-APRM; Source Range Monitor Level; Condensate Conductivity; Turbine Speed and Valve Disposition; Condensator Vacuum~~

RESPONSE:

The pointers on the GE stripchart recorders will be adjusted where appropriate to remove any obstruction of the scale.

IMPLEMENTATION:

By the completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

WORK NO.: 0171

12 HED NO.: 5.2.2.A.2-2

CATEGORY: 1 LEVEL: C

FINDING:

The pointers on trend recorders and rotary meters cover the numbers on the scale. Photo log (I-10).

IRM-APRM; IRM-APRM/RBM; IRM-APRM/RBM; IRM-APRM; Inlet Flow to 2/3 Chimney Off Gas After Filter; Gamma Radiation Monitor Channel B; Vibration Phase Angle (Rating Meter); Turbine Speed/Valve Position; All Rotary Meters Ex Trans 21 to B23; PHB Trans 22 to B23/PHB; IRM-APRM; IRM-APRM/RBM; IRM-APRM/RBM; IRM-APRM; Inlet Flow To Holding Line; Hydrogen Addition Monitor Drive; Hydrogen Addition Monitor Drive; Drywell H₂/Torus H₂ Gamma Radiation Monitors Channel A; Hydrogen Addition Monitors Drive; Hydrogen Addition Monitors Drive; Drywell H₂/Torus H₂ Gamma Radiation Monitors Channel B; Vibration Phase Angle Rotary Meter; Turbine Speed; All Rotary Meters

RESPONSE:

Trend recorders cited are used for trend information only. The specific values of the rotary meters do not significantly effect operation because enough of the numerals can normally be seen so that the meters can be read.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0173

12 HED NO.: 5.2.2.A.2-4

CATEGORY: 1 LEVEL: C

FINDING:

The meter pointers cover the numbers on the scale. This can make accurate reading of the scale difficult. (Photo Log I-12)

RESPONSE:

Most of the meters specified have very thin pointers which do little to obstruct the numbers on the meters. An informal survey of operators indicates that these meters are not frequently used.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0311

12 HED NO.: 5.2.2.B.2-7

CATEGORY: 2 LEVEL: C

FINDING:

Pointers of meters are not mounted to avoid parallax. This may cause inaccurate reading of meter.

RESPONSE:

Parallax does not appear to be a significant problem. High accuracy is not required for meters indicated (back panel radiation level meters).

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0067

12 HED: 5.2.2.C.2-5

CATEGORY: 2 LEVEL: B

FINDING:

The meter pointer covers numbers on the scale. Being able to read the number which is being pointed at allows for greater ease and accuracy in reading the meter (Photo Log No. I-13).

RESPONSE:

The pointers on the rotary meters only partially cover the numbers. Enough of the numerals can be seen so that the meters can be read. The numbers can also be quickly determined from a progression of the previous number.

IMPLEMENTATION:

As is.

4380/c/80

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0312

12 HED NO.: 5.2.2.C-8

CATEGORY: 1 LEVEL: C

FINDING:

The position of the pointer is not easily recognized due to a clear green band on the lens which partially obscures the red pen of the recorder.
(Photo Log L-36)

DP Controller Ht Exc HA; Drywell Press; Containment Press; Narrow Range Torus; Man Load Sta Low Flow Valve; Gas Reheater A Outlet Temp; Gas Reheater B Outlet Temp; HD Cooling Flow Cont V-205-2-3; Man Load Sta Low Flow Valve; Gas Reheater A Outlet Temp; Gas Reheater B Outlet Temp; Gen Hydrogen Circ. Water Control; Eccentricity Vibration; Expansion and Metal Temp.

RESPONSE:

The recorders stated will be color banded in such a manner to allow the pointer to be visible at all times.

IMPLEMENTATION:

By  completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0315/0142

12 HED NO.: 5.2.3.C-1/-2

CATEGORY: 1 LEVEL: C

FINDING:

Color coding is not used for zone marking of displays. Color coding of zones helps to indicate normal and abnormal operating ranges and limits.

RESPONSE:

Color banding for zone marking displays will be implemented where appropriate.

IMPLEMENTATION:

By completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 143

12 HED NO.: 5.2.3.C-3

CATEGORY: 2 LEVEL: C

FINDING:

Red is used to indicate the N₂ level. Red is generally used to indicate an abnormal condition. This is an inconsistent use of color and could cause confusion.

RESPONSE:

In this case red is not used as a color code to indicate a condition but to specify the tank level.

IMPLEMENTATION:

Accept as is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0313

12 HED NO.: 5.2.4.A-1

CATEGORY: 1 LEVEL: C

FINDING:

The numerals on the fixed scales are not vertical. This can make scales difficult to read.

RESPONSE:

They are semicircular meters in which the scale does not greatly deviate from vertical.

IMPLEMENTATION:

Accept as is.

DRESDEN CORRECTIVE ACTIONS

WORK NO.: 0314

12 HED NO.: 5.2.4.B.2-3

CATEGORY: 1 LEVEL: C

FINDING:

The null position between positive and negative values is not at the 12 o'clock position on the circular meters. This position conforms with the population stereotype to allow for quick and accurate reading of the meter.

RESPONSE:

These meters indicate period (sec) and the null position is the infinity symbol. The meter is offset with the null position at about the 8 o'clock position to allow for a wider spread of the range to the positive side of the scale.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0365

12 HED NO.: 5.3.1.A.1-1

CATEGORY: 1 LEVEL: B

FINDING:

No method is provided for determining lamp failure in indicating lights except by visual inspection.

RESPONSE:

The operators are aware of the responsibility to check for burned out indicator lights.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0427

12 HED NO.: 5.3.1.C.2-3

CATEGORY: 1 LEVEL: C

FINDING:

Provisions are not made to prevent the interchanging of lenses or indicator lights.

RESPONSE:

A procedure will be developed and implemented that specifies that colored lenses of indicator lights will be removed one at a time when replacing indicator bulbs. If only one lens is removed there can be no interchange with another lens. This procedure will establish careful replacement of bulbs and handling of lenses as a utility concern to be followed by operations and maintenance personnel.

IMPLEMENTATION:

By the completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0316, 0324

12 HED NO.: 5.3.3.A.2-1, 5.3.3.A.3-3

CATEGORY: 1 LEVEL: C

FINDING:

The legends of legend light indicators cannot be read under ambient lighting when indicator light is off and do not contrast sufficiently with the legend background.

RESPONSE:

Lenses on legend light indicators will be replaced with more lightly tinted lenses or with high contrast lettering. The modification will facilitate reading the legend light indicators under ambient lighting when the indicators are not illuminated. Legend light readability will be evaluated in terms of future changes to control room lighting.

IMPLEMENTATION:

Following the completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0438

12 HED NO.: 5.3.3.B.1-10

CATEGORY: 2 LEVEL: C

FINDING:

Three types of legend design are used for legend light indicators. A consistent legend design allows for quick recognitions and reading of legends. [Photo Log 0-11 (903-7) 0-16 & 17 (903-54)]

RESPONSE:

Legend lights will be reviewed during the preparation of the landing package. Inconsistencies that make reading legends difficult or not easily recognized will be corrected.

IMPLEMENTATION:

By completion of the second fuel outage.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0325

12 HED NO.: 5.3.3.B.2-5

CATEGORY: 2 LEVEL: C

FINDING:

The lettering of legends of the H₂ Analyzer legend indicators is not consistent with that used throughout the rest of the control room. Consistent lettering improves recognition and readability of legend indicators. (Photo Log M-7)

RESPONSE:

These indicators have been removed from service.

IMPLEMENTATION:

Completed.

4381c/pg25

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0326

12 HED NO.: 5.3.3.B.2-6

CATEGORY: 1 LEVEL: C

FINDING:

The lettering on legend lights (Turbine Panel, EGC and Rod Display) does not subtend 15 min of visual angle at a viewing distance of 3 feet. This visual angle allows for optimal readability of the legends.

RESPONSE:

The visibility of the legend light characters is good, they can be read with little difficulty. This does not effect operator response.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0327

12 HED NO.: 5.3.3.B.5-7

CATEGORY: 2 LEVEL: C

FINDING:

The legend on the legend light contains more than 3 lines of text.
Photo Log (M-9)

RESPONSE:

This legend light is actually two lights in one, with the top half containing 2 lines and the bottom half 2 lines, for a total of 4 lines.

IMPLEMENTATION:

Accept as is.

447/c/42

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 458

12 HED NO.: 5.3.3.B.6-12

CATEGORY: 2 LEVEL: C

FINDING:

Nomenclature and abbreviations on legend lights are not consistent throughout the control room and in the procedures. This may cause confusion or an error in the use of the display.

RESPONSE:

Nomenclature and abbreviations on legend lights will be reviewed during the preparation of the control room labeling review. Abbreviation will be checked to ensure conformance with a Dresden standard abbreviations list. A consistent nomenclature will be established between indicator light legends and procedures.

IMPLEMENTATION:

By completion of the second refueling outage.

4409/c/12

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0436

12 HED: 5.3.3.D-9

CATEGORY: 2 LEVEL: C

FINDING:

The color of legend light indicators when lit does not conform to the general color code employed throughout the control room. (Photo Log 0-11)

RESPONSE:

The use of color will be reviewed during the development of the labeling page. A color code standard will be established and implemented on legend light indicators where appropriate.

IMPLEMENTATION:

By completion of the second refueling outage.

4385/c/11

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0391

12 HED NO.: 5.4.1.B-1

CATEGORY: 1 LEVEL: C

FINDING:

The scales printed on the recording paper are not the same as the scales shown on the recorder. This may lead to confusion or misreading of the recorder.

RESPONSE:

The recorder paper will be replaced with paper with the appropriate scale.

IMPLEMENTATION:

By the completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

WORK NO.: 0428

12 HEAD NO.: 5.4.1.H-4

CATEGORY: 1 LEVEL: B

FINDING:

A graphic recorder for torus water temperature is needed on the 90X-4 panel.

RESPONSE:

A graphic recorder will be provided on unit 3 to provide proper indication.

IMPLEMENTATION:

By the completion of the first refueling outage.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0429

12 HED NO.: 5.4.1.1.1-5

CATEGORY: 2 LEVEL: C

FINDING:

A high speed option is not provided for removal of paper from recorders. This option makes it easier to remove portions of the record as needed and to quickly change paper.

RESPONSE:

The need for taking only part of a record is rare. Manual removal is adequate under most conditions.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

WORK NO.: 0393

12 HED NO.: 5.4.2.A.1-1

CATEGORY: 2 LEVEL: C

FINDING:

Labels do not identify the parameter being read on multipen recorders. This may lead to confusion as to what the display is indicating.

RESPONSE:

The proper labels identifying the parameter being recorded will be fabricated and mounted.

IMPLEMENTATION:

By completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0405

12 HED NO.: 5.5.1.A.2-1

CATEGORY: 2 LEVEL: C

FINDING:

The width to height ratio for the numerals on drum counters is not 1:1. The ratio for the cited drum counters is 2:1.

RESPONSE:

The drum counters cited are the only ones in the control room. The drum counter numerals are not difficult to read. This does not effect operator response.

IMPLEMENTATION:

Accept as is.

DRESDEN CORRECTIVE ACTIONS

I NO.: 0406

12 HED NO.: 5.5.1.A.3-2

CATEGORY: 2 LEVEL: C

FINDING:

Numerals on drum counters are in groups larger than four without commas or decimal points as separators. Separators help display to be easily and accurately read. (Photo Log N-24)

RESPONSE:

These meters display digits which are easily read and interpreted.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0407

12 HED NO.: 5.5.1.A.4-3

CATEGORY: 2 LEVEL: C

FINDING:

The numerals on drum counters are white on a black background. This does not provide optimum contrast, dark numerals on a light background are preferred.

RESPONSE:

The drum counters are not difficult to read, the contrast is adequate. This does not effect operator response.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0408

12 HED NO.: 5.5.1.C.1-4

CATEGORY: 2 LEVEL: C

FINDING:

Numerals on drum counters change by continuous motion and not snap action. Continuous motion of numbers permits an ambiguous reading of the meter.

RESPONSE:

One digit off in reading of meters is not significant. These are read once an hour, and the motion is continuous but is very slow.

IMPLEMENTATION:

Accepted as is.

4381c/pg17

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0409

12 HED NO.: 5.5.2.A.3-1

CATEGORY: 2 LEVEL: C

FINDING:

The numerals on LED indicators do not subtend a visual angle greater than 15 min of arc. This guideline is stated to ensure easy and accurate reading of LED indicators.

RESPONSE:

These indicators are used for testing and calibration of instrumentation. The LED indicators are easily read. This does not affect operator response.

IMPLEMENTATION:

Accepted as is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0410

12 HED NO.: 5.5.2.A.5-2

CATEGORY: 2 LEVEL: C

FINDING:

The distance between numerals on LED indicators is greater than one half the numeral width. Having the space between numerals between $1/2$ and $1/4$ the numeral width allows associated numerals to be seen as related together and still easily read.

RESPONSE:

The cited LED indicators are set apart from one another in distinct groupings so that those associated together are apparent.

IMPLEMENTATION:

Accepted as is.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0394

12 HED NO.: 5.6.2.B.3-2

CATEGORY: 1 LEVEL: C

FINDING:

The number printing mechanisms on the graphic recorders do not provide clear sharp numbers. (Photo Log N-29)

RESPONSE:

The keys will be cleaned or replaced as needed so they will print clearly.

IMPLEMENTATION:

By completion of the second refueling outage.

4430/c/9

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0431

12 HED NO.: 5.6.2.B.4-3

CATEGORY: 1 LEVEL: C

FINDING:

There is no channel selection capability for particular discrete recorders.

RESPONSE:

The recorders are not used during emergencies. They are used for historical purposes only.

IMPLEMENTATION:

As is.

SECTION 6
LABELS AND LOCATION AIDS

DRESDEN CORRECTIVE ACTIONS

IN NO: 0029, 0012, 0062, 0052

12 HED NO.: 6.1.1.-1, -2, -3, -4

CATEGORY: 2 LEVEL: C

FINDING:

Controls, displays and other equipment located in the control room are not appropriately and clearly labeled. Photo Log (K-2, B-35, B-25, I-14)

RESPONSE:

A labeling program that considers all recommendation and employs some human factors principles will be developed and applied to new labels on the control boards.

IMPLEMENTATION:

By completion of the second refueling outage.

4424/c/4

DRESDEN CORRECTIVE ACTIONS

I NO.: 0603

12 HED: 6.1.1-5

CATEGORY: 2 LEVEL: B

FINDING:

Need for labeling.

RESPONSE:

Labels will be addressed in the implementation of a consistent labeling package.

IMPLEMENTATION:

By completion of the second refueling outage.

4399/c/28

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0053/0030/0063/0013

12 HED NO.: 6.1.2-4/6.1.2.A-1/6.1.2.A-3/6.1.2.A-2

CATEGORY: 2 LEVEL: B

FINDING:

A hierarchical labeling scheme is not applied on panel P-18 for switchyard systems. Photo Log(I-15, B-26, B-1, B-36)

RESPONSE:

A hierarchical labeling system will be developed and the panel will be relabeled as per the labeling package.

IMPLEMENTATION:

By the completion of the second refueling outage.

4402/c/12

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0063

12 HED NO.: 6.1.2.A.3-1

CATEGORY: 3 LEVEL: B

FINDING:

A hierarchical labeling system is not used on the back panels of the control room. Photo Log (B-26)

RESPONSE:

A review will be performed to determine if a hierarchical labeling scheme can be applied. The CR back panels will be re-labeled as necessary, following a hierarchical labeling scheme, if possible, as a function of the relabeling of the control room.

IMPLEMENTATION:

By completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

WORK NO.: 0014/0031

12 HED: 6.2.1.A-1/6.2.1.A-5

CATEGORY: 2 LEVEL: B

FINDING:

Labels are not consistently placed below displays and above controls in the main control room (Photo Log B-2, B-3, C-30).

RESPONSE:

Placement of labels will be addressed in the implementation of a consistent labeling package.

IMPLEMENTATION:

By completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0032/0015/0064/0054

12 HED: 6.2.1.B-2/6.2.1.B-6
6.2.1.B-9
6.2.1.B-11

CATEGORY: 2 LEVEL: B

FINDING:

Placement of labels on control panels does not conform to guidelines (Photo Log B-4, B-26, B-36, I-16).

RESPONSE:

Placement of labels will be addressed in the implementation of a consistent labeling package.

IMPLEMENTATION:

By the completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

IN NO: 0033/0016

12 HED: 6.2.1.C-3/6.2.1.C-7

CATEGORY: 2 LEVEL: B

FINDING:

Labels are presented above displays that are located above eye level
(Photo Log B-3, A-33).

RESPONSE:

Placement of labels will be addressed in the implementation of a
consistent labeling package.

IMPLEMENTATION:

By the completion of the second refueling outage.

43800/pg58

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0065

12 HED NO.: 6.2.1.C-10

CATEGORY: 1 LEVEL: B

FINDING:

Labels for controls positioned above eye level are located above the control, reducing visibility of the label.

RESPONSE:

Labels will be repositioned below controls above eye level, as a function of the control room labeling package.

IMPLEMENTATION:

By the completion of the first refueling outage.

DRESDEN CORRECTIVE ACTIONS

IR #: 0034

12 GUIDE NO.: 6.2.1.E-4

CATEGORY: 2 LEVEL: C

FINDING:

Labels appear on the control escutcheon plate and handle which describe the control function. Placement of labels on the handle can obstruct the view of the label during control actuation. Placement of labels on the escutcheon plate is inconsistent with the normal placement on an external label. (Photo Log A-5)

RESPONSE:

Labels on the escutcheon plates will be placed consistent with normal placement of labels in the control room. These labels will adhere to sound human factors principles and will be addressed as a function of the labeling program.

IMPLEMENTATION:

By completion of the second refueling outage.

4424/c/6

DRESDEN CORRECTIVE ACTIONS

NO. : 0017/0055

12 HED: 6.2.1.E-8/6.2.1.E-12

CATEGORY: 2 LEVEL: B

FINDING:

Function labels are placed on the control escutcheon plate. Labels appear on the control escutcheon plate which describe the control function. (Photo Log I-17).

RESPONSE:

Placement of labels will be addressed in the implementation of a consistent labeling package.

IMPLEMENTATION:

By completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

IN NO: 0018, 0056, 0035, 0066

12 HED NO.: 6.2.2.A-1, -2, -3, -4

CATEGORY: 2 LEVEL: C

FINDING:

Labels are mounted such that they can be accidentally removed.
Adhesives are generally not permanent and can cause a label to peel
or fall off (dynotape, scotch tape, etc.). Photo Log (C-1, I-18,
B-5, B-28)

RESPONSE:

Characteristics of labels will be addressed in the implementation of
a consistent labeling package. The package will insure that labels
are mounted in such a way to preclude accidental or easy removal.

IMPLEMENTATION:

By completion of the second refueling outage.

4424/c/8

DRESDEN CORRECTIVE ACTIONS

IN NO.: 0617

12 HED: 6.2.2.A-5

CATEGORY: 2 LEVEL: B

FINDING:

Labels may be accidentally removed.

RESPONSE:

The characteristics of labels will be addressed in the implementation of consistent labeling package.

IMPLEMENTATION:

By completion of the second refueling outage.

4399/c/29

DRESDEN CORRECTIVE ACTIONS

INNOVATION NO.: 0163/0036

12 HED: 6.2.3.A.2-2/6.2.3.A.1-1

CATEGORY: 2 LEVEL: B

FINDING:

Labels are positioned vertically where space is available for horizontal placement (Photo Log G-29, Panel 903-11, Photo Log B-6).

RESPONSE:

Placement of labels will be addressed in the implementation of a consistent labeling program. Labels will be positioned horizontally where space is available.

IMPLEMENTATION:

By the completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

INSTRUMENT NO.: 0037

12 HED: 6.2.4.B-1

CATEGORY: 1 LEVEL: B

FINDING:

Labels are obscured because of blockage due to raised instruments from a normal viewing position (Photo Log B-7). 1) On the vertical board section of 902-4 the label for the "Recirc Loop Temps" per recorder is blocked from normal viewing distance. The label is located just below the pen recorder on the panel. 2) On the vertical board section of 902-8 the label for "Gen 2 Gross Megawatts" pen recorder is blocked from normal viewing distance. The label is located just below the pen record on the panel. EPN=2-6040.13 3) On the horizontal board section of 902-3 the label for the "HPCI Auto Initiate" pushbutton is blocked by the raised guard box placed around the pushbutton. EPN=2330-322 4) On the lower vertical board section of panels 902-55 902-56 labels for pen recorders are located below the instrument. Labels are blocked due to the low height of pen recorders on the board and the placement of labels on the panel below the instrument.

Panel	EPN	Equipment Name
902-55	2420A	Gamma Radiation (Monitor)
902-56	2420B	Gamma Radiation (Monitor)

RESPONSE:

Labels will be designed to fit on the face of the recorders, thus raising them above the visual obstruction and eliminating the problem.

IMPLEMENTATION:

By the completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

IN NO.: 0019

12 HED: 6.2.4.B-3

CATEGORY: 2 LEVEL: B

FINDING:

Labels are obscured by other pieces of equipment (Photo Log C-2).

RESPONSE:

Placement of labels will be addressed in the implementation of a consistent labeling package. All labels obscured by other pieces of equipment will be replaced by those that are not obscured.

IMPLEMENTATION:

By completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

I NO.: 0067

12 HED: 6.2.4.B-5

CATEGORY: 2 LEVEL: B

FINDING:

Component labels on the back panels are covered by other types of labels (Photo Log B-29).

RESPONSE:

Placement of labels will be addressed in the implementation of a consistent labeling package. All label types which obscure component labels on the back panels will be replaced.

IMPLEMENTATION:

By completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

IN NO.: 0038/0020/0068

12 HED: 6.2.4.C-2/6.2.4.C-4
6.2.4.C-6

CATEGORY: 2 LEVEL: B

FINDING:

The operator's hand obscures labels on vertical board during actuation (Photo Log B-8, C-3, C-30, B-31).

RESPONSE:

Placement of labels will be addressed in the implementation of a consistent labeling package. Labels will be replaced on the vertical boards to prevent the operators hand from obscuring the labels during actuation.

IMPLEMENTATION:

By the completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

IN NO: 0177, 0068

12 HED NO.: 6.2.4.D-7, 6.2.4.D-8

CATEGORY: 2 LEVEL: C

FINDING:

At the time of observation the labels were dirty. There is no set schedule for the cleaning of the labels. Photo Log (I-26, I-27)

RESPONSE:

A procedure will be established for the periodic cleaning of the labels.

IMPLEMENTATION:

By completion of the second refueling outage.

4424/c/9

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 460

12 HED NO.: 6.3.1.A-1

CATEGORY: 2 LEVEL: C

FINDING:

Labels do not describe the primary function of equipment items. This may lead to confusion as to its appropriate use.

RESPONSE:

Description of primary function of equipment items on component labels will be examined during the control room comprehensive labeling review. Labels will be replaced to provide this information when appropriate.

IMPLEMENTATION:

By the completion of the second refueling outage.

4409/c/13

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 461,432

12 HED NO.: 6.3.1.B-3, 6.3.1.B-OS,2

CATEGORY: 2 LEVEL: C

FINDING:

Labels do not describe the secondary functions of equipment items such as engineering characteristics on nomenclature. Secondary functions help to clarify the use of the equipment. This was also indicated during the operator survey.

RESPONSE:

Description of secondary functions of equipment items on component labels will be examined during the control room comprehensive labeling review. Labels will be replaced to provide this information when appropriate.

IMPLEMENTATION:

By the completion of the second refueling outage.

4409/c/14

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0183/0071

2 HED NO.: 6.3.2.A-1

CATEGORY: 1 LEVEL: C

FINDING:

The switch position on J-handles are labeled as "TRIP" and "CLOSE". This is a pump control switch which is either "ON" or "OFF". The label does not correctly describe the state of the pump. Photo Log(J-7)

RESPONSE:

"TRIP" and "CLOSE" on the J-handles refer to the state of the circuit breaker which starts and stops the pump. This is common knowledge to the operators. This is also a more proper indication to the operator; if the switch indicates "ON" it does not necessarily mean the pump is running. If the switch indicated "CLOSE", the circuit breaker is closed, the true condition of the switch-not the pump.

IMPLEMENTATION:

Accepted as is.

4409/c/15

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0072

12 HED NO.: 6.3.2.A-3

CATEGORY: 2 LEVEL: C

FINDING:

These controls say "trip" and "close" but are actually resets. Having the controls labeled exactly what they are doing allows for a clearer understanding of the process being controlled. (Photo Log J-15).

RESPONSE:

Control labels will be examined during the comprehensive control room labeling review to ensure that they state clearly and accurately what the controls are doing. Labels will be replaced when appropriate to ensure that the operator is aware of the control conditions.

IMPLEMENTATION:

By completion of the second refueling outage.

4409/c/21

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0073

12 HED NO.: 6.3.2.B-4

CATEGORY: 2 LEVEL: C

FINDING:

It is not clear as to whether this meter is maintaining service air for Unit 2, Unit 3, or both. Clear labeling facilitates understanding and interpretation of displays and controls. (Photo Log J-22).

RESPONSE:

Labels will be examined during the comprehensive control room labeling review to ensure that it is clear to the operators exactly which equipment is referred to by component labels. Labels will be replaced when necessary to reduce ambiguity.

IMPLEMENTATION:

By completion of second refueling outage.

4409/c/22

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0074

12 HED NO.: 6.3.2.B-5

CATEGORY: 2 LEVEL: C

FINDING:

"OP FLR" on component label should be "refuel floor". Clear labeling facilities understanding and interpretation of displays and controls. (Photo Log J-20).

RESPONSE:

The cited meter indicates the differential pressure between the refuel floor and the outside atmosphere. The component label will be changed to read "REFUEL FLOOR" or some comparable abbreviation compatible with Dresden abbreviation standard.

IMPLEMENTATION:

By completion of second refueling outage.

4409/c/23

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0075

12 HED NO.: 6.3.2.B-6

CATEGORY: 2 LEVEL: C

FINDING:

It is not clear as to whether the dry well (DW) or torus (TR) temperature is being measured. Clear labeling facilitates understanding and interpretation of displays and controls. (Photo Log J-21).

RESPONSE:

The meter measures the temperature from the drywell or from the torus depending on the alignment of the valves. Reading this meter is part of a sequence, when the operator reads this temperature meter he knows from other indications whether it is drywell or torus temperature.

IMPLEMENTATION:

Accept as is.

4409/c/24

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0039, 0021, 0069

12 HED NO.: 6.3.3.A-1/-4/-7

CATEGORY: 2 LEVEL: C

FINDING:

There is no standard list of acronyms, abbreviations and part/system numbers. A standard of nomenclature reduces ambiguity, helps the operator become familiar with the meaning of labels, annunciators, and procedures without deciphering unfamiliar acronyms and abbreviations.

RESPONSE:

A standard list of abbreviations and acronyms will be developed and incorporated into the review of control room labels, and annunciator tiles. Standard nomenclature will be incorporated into procedures after completion of procedures generation program. When possible words will be spelled out for optimum recognition, when this is not practical the standard abbreviation list will be used.

IMPLEMENTATION:

By completion of second refueling outage.

4409/c/25

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0022, 0070, 0040

12 HED NO.: 6.3.3.B-5, B-8, B-2

CATEGORY: 2 LEVEL: C

FINDING:

Labels on front and back panels do not appear to be consistent in their use of words acronyms and abbreviations. Consistency among labels can improve operator identification of label content. Photo Log(C-4, B-32)

RESPONSE:

A standard list of abbreviations and acronyms will be developed and incorporated into the review of control room labels and annunciator tiles. Labels with abbreviations that do not conform to the standard list will be replaced.

IMPLEMENTATION:

By the completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

INSTR. NO.: 0041/0071/0023

12 HED NO.: 6.3.3.C-3/6.3.3.C-9/6.3.3.C-6

CATEGORY: 1 LEVEL: C

FINDING:

There is a mismatch between nomenclature used in procedures and that printed on the labels. Similiarity of nomenclature can improve control room operations by reducing operator interpretation and errors in component identification. Photo Log(B-10)

RESPONSE:

Standards for nomenclature will be established. Labels will be replaced to conform to standardized nomenclature. Procedures will be revised as part of the normal review cycle.

IMPLEMENTATION:

By the completion of the second refueling outage.

4397/c/44

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0072

12 HED NO.: 6.3.4.E-1

CATEGORY: 2 LEVEL: C

FINDING:

Roman numerals are used on back panel labels to distinguish components. Arabic numerals are generally used by convention. Certain Roman numerals can be confused with Arabic characters. Photo Log (B-33)

RESPONSE:

Control room labeling will be reviewed and inconsistencies will be corrected. Roman numerals will be used to differentiate ESS systems.

IMPLEMENTATION:

By the completion of the second refueling outage.

4407c/19

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0042, 0024, 0057

12 HED NO.: 6.3.6.-1/-2/-3

CATEGORY: 2 LEVEL: C

FINDING:

The same nomenclature is used on labels in close proximity. Labels should be used to clearly distinguish functions among panel elements. Photo Log (C-6, I-19, B-11)

RESPONSE:

Similarity of labels in close proximity to one another will be examined during the comprehensive control room labeling review. To ensure that labels clearly distinguish the function of each component, labels that could present ambiguity will be replaced. In many instances, components with similar functions are grouped, the difference in the label being only a letter or system number - this does not present a problem because of the similarity of function. Labels will accurately describe component function, this will reduce any ambiguity.

IMPLEMENTATION:

By the completion of the second refueling outage.

4409/c/18

DRESDEN CORRECTIVE ACTIONS

IN NO.: 0043/0058/0025/0073

12 HED NO.: 6.3.7.A-1/6.3.7.A-4/
6.3.7.A-5/6.3.7.A-7

CATEGORY: 2 LEVEL: B

FINDING:

Labels are not used to identify functional groups (Photo Logs B-1, I-20, C-7, B-26).

RESPONSE:

Labels will be addressed in the implementation of a consistent labeling package. The labeling package will consider functional grouping of controls and displays.

IMPLEMENTATION:

By the completion of the second refueling outage.

4380c/pg42

DRESDEN CORRECTIVE ACTIONS

NO.: 0044/0011/0074

12 HED: 6.3.7.B-2/6.3.7.B-3
6.3.7.B-6

CATEGORY: 2 LEVEL: B

FINDING:

Labels are not placed above the functional group they identify (Photo Logs B-4, B-26).

RESPONSE:

Placement of labels will be addressed in the implementation of a consistent labeling package. Labels will be placed above the functional groups they identify.

IMPLEMENTATION:

By the completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

IN NO.: 0189/0188

L2 HFD NO.: 6.3.8.A-6/6.3.8.A-5

CATEGORY: 2 LEVEL: C

FINDING:

This thumbster control has "open" and "close" positions which are not labeled. The J-handles can be placed in three positions, none of which are marked. Photo Log(J-8). Labeling of functional control positions facilitates proper use of the control. Photo Log(J-8, J-12). Steam to Condenser; Reject Steam to Condenser Control; Glnd Stm Cord Exl Dsch Valve Mov D-1; Glnd Stm Cord Exl Dsch Valve Mov D-2.

RESPONSE:

According to the operators this control is rarely used. The same control on unit 2 is properly labeled. However, labeling of switch positions will be reviewed during the development of the labeling package. Switch positions for "close" and "open" will be provided for thumb control switches and all detents on J-handle controls will be labeled.

IMPLEMENTATION:

By completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0045/0187/0059

12 HED NO.: 6.3.8.B-1/A-4/B-4

CATEGORY: 1 LEVEL: C

FINDING:

Control positions are not clearly labeled on the cited controls. In some cases, thumb control reset switches must be turned both to the left and to the right for the reset to be accomplished. This is not labeled. In other instances, the direction of motion (close-open) is not clearly labeled (Photo Log B-12, J-8 and I-21). Pump Suction VNO.2-140 2-3B; Disch to Comd; LPCI Pump Suction Valve 2-1501; Cleanup Inlet Isol; Recirc Pump Bypass; Cleanup Fltr Bypass; Reactor Outlet Isol; Cleanup Inlet Isol; Aux Pump Suction Isol; Breaker Control Sw on Common Panel; Main Stm Isol Reset; Isol Cond Reset; Main Stm Isol Reset; Isol Cond Reset; Drywell Isol Reset; Drywell Isol Reset; Trans 81 Synch; Line 1207 Synch.

RESPONSE:

Labeling of switch positions and direction of switch movement will be reviewed during development of labeling package. The discrepant controls will be reviewed on a case by case basis to determine the proper label to be assigned to each control to properly identify switch position and direction of movement.

IMPLEMENTATION:

By completion of the second refueling outage.

4397/c/47

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0046

12 HED: 6.3.8.C-2

CATEGORY: 2 LEVEL: C

FINDING:

Control position information is not visible to the operator during control operation. Visibility of all control position information can ensure accurate control operation. Photo Log (B-13).

<u>PANEL</u>	<u>EPN</u>	<u>LABEL</u>
902-8	2122V	B21-B22 VOLTS
902-8	2324V	B23-B24 VOLTS
902-8	2526V	B25-B26 VOLTS
902-8	2700V	B27 VOLTS
903-7	03-7-134	BYP VALVE TEST
903-8	2122V	B21-B22 VOLTS
903-8	2324V	B23-B24 VOLTS
903-8	2526V	B25-B26 VOLTS
903-8	2700V	B27 VOLTS

RESPONSE:

Appropriate switch position labels will be provided. Labels will be made to ensure that switch position information is visible to the operator.

IMPLEMENTATION:

By the completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0026, 0060

12 HED: 6.3.8.C-3, 6.3.8.C-5

CATEGORY: 2 LEVEL: C

FINDING:

Control position information is not visible to the operator during the operation of the control. Visibility of all control position information can ensure accurate control operation. Seven controls are affected by this guideline. Photo Log (C-8, I-22)

<u>PANEL</u>	<u>EPN</u>	<u>LABEL</u>
902-7	02-7-134	BYP VALVE TEST
923-2	23-2-38	BUS 11 BUX 105
923-2	23-2-39	BUS 9 BUS 10N
923-2	23-2-41	BUS 14 BUS 11
923-2	23-2-46	BUS 3 BUS 25
P-18	138-13	BUS 4 VOLTMETER SELECTOR SWITCH
P-18	138-14	VOLTMETER SELECTOR SWITCH

RESPONSE:

These controls provide mechanical feedback of control activation; visible feedback is secondary to the tactile feedback. The switch position can be seen with a little head movement.

IMPLEMENTATION:

Accept as is.

DRESDEN CORRECTIVE ACTIONS

NO. : 0047

12 HED: 6.4.1.A.1-1

CATEGORY: 2 LEVEL: B

FINDING:

Character heights do not subtend a minimum visual angle of 15 minutes of arc (Photo Log B-14).

RESPONSE:

Characteristics of labels will be addressed in the implementation of a consistent labeling package. The labels will be designed to subtend the recommended visual angles.

IMPLEMENTATION:

By completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

EX NO.: 0048/0061/0028

12 HED NO.: 6.4.1.A.2-2/6.4.1.A.2-8/
6.4.1.A.2-5

CATEGORY: 2 LEVEL: B

FINDING:

Letter heights are not identical for labels within the same hierarchical level (Photo Log B-15).

RESPONSE:

Characteristics of labels will be addressed in the implementation of a consistent labeling package and will be identical within the same hierarchical level.

IMPLEMENTATION:

By the completion of the second refueling outage.

INDEX NO.: 0049/0029/0075/0062

1 AD: 6.4.1.B.1-3/1-6/1-7/1-9

CATEGORY: 1 LEVEL: C

FINDING:

On labels, light colored characters appear on dark backgrounds. (Photo Log B-16)

RESPONSE:

A system will be developed for use of color in labeling in accordance with principles given in guideline 5.1.6. This system will be coordinated with the color coding system developed for the whole control room.

In general the system will adopt labels all of one color with lettering of good contrast (e.g., black letters on white labels). Other contrasting colors will be used in the background, for demarcation and mimics.

IMPLEMENTATION:

By the completion of the second refueling outage.

4 c/15

DRESDEN CORRECTIVE ACTIONS

INSTR NO.: 0050/0076

12 HED: 6.4.2.A.1-1/6.4.2.A.1-2

CATEGORY: 2 LEVEL: B

FINDING:

Labels do not consistently use capital letters (Photo Log B-17, B-34).

RESPONSE:

Characteristics of labels will be addressed in the implementation of a consistent labeling package and will consistently use capital letters.

IMPLEMENTATION:

By completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

IN NO.: 0190/0079

12 HED: 6.5.1.A-8/6.5.1.A-9

CATEGORY: 2 LEVEL: B

FINDING:

Temporary labels are used unnecessarily in place of permanent labels (Photo Log J-9, J-16).

RESPONSE:

Labels will be addressed in the implementation of a consistent labeling package. The use of temporary labels will be controlled and all unnecessary labels will be replaced with permanent labeling.

IMPLEMENTATION:

By the completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

IN NO.: 0051/0030

12 HFD: 6.5.1.B-10/6.5.1.B-5

CATEGORY: 2 LEVEL: 3

FINDING:

Temporary labels do not conform to good human engineering principles (Photo Log B-18, I-30).

RESPONSE:

Labels will be addressed in the implementation of a consistent labeling page.

IMPLEMENTATION:

By completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0052/0031

12 HED NO.: 6.5.1.C-2/6.5.1.C-6

CATEGORY: 2 LEVEL: B

FINDING:

Permanent label information is partially or totally obscured by a temporary label (Photo Log B-18, C-15).

RESPONSE:

Labels will be addressed in the implementation of a consistent labeling page. The temporary labeling which obscures the permanent labeling will be removed and replaced.

IMPLEMENTATION:

By the completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

IN NO.: 0053/0054

12 HED: 6.5.1.F-3/6.5.1.H-4

CATEGORY: _____ LEVEL: _____

FINDING:

"Tag outs" obscure the labels of equipment that is out of service and on equipment located below the tags.

RESPONSE:

Indicating lights are not obscured. Operators can easily move the tag outwards to read the label identifying out of service equipment.

IMPLEMENTATION:

As is.

DRESDEN CORRECTIVE ACTIONS

IN NO.: 0070/0080/0182/0200/0198

12 HED NO.: 6.5.2.A-2/6.5.2.A-1/6.5.2.B.6-13/6.5.2.B.4-9

CATEGORY: 1 LEVEL: C

FINDING:

There is no administrative procedure for controlling the use of temporary dynotape labels.

RESPONSE:

The use, control and handling of temporary labels is currently controlled from DAP 7-8. This procedure assures that those temporary labels are only used as needed, and that they are replaced with permanent labels in a reasonable amount of time. This procedure does not need to address OOS cards or caution cards, as these are controlled by DAP 3-5 and DAP 3-8.

IMPLEMENTATION:

Completed.

4381c/pg75

DRESDEN CORRECTIVE ACTIONS

X NO.: 0195

12 HED NO.: 6.5.2.B.1-3

CATEGORY: 1 LEVEL: C

FINDING:

There is no review procedure in place for determining when temporary labels are needed.

RESPONSE:

The guidance for determining when temporary labels are used is presently covered in DAP 7-8. This document will be revised to establish a procedure for determining when temporary labels are needed. This procedure will clearly outline the need for temporary labels, and will limit their use as much as possible. This procedure will not cover out-of-service cards or caution cards, which are covered in DAP 3-5 and DAP 3-8.

IMPLEMENTATION:

By completion of the second refueling outage.

4381c/pg77

DRESDEN CORRECTIVE ACTIONS

IN NO.: 0196/0081

12 HED NO.: 6.5.2.B.2-5

CATEGORY: 1 LEVEL: C

FINDING:

There is no review procedure in place for determining how temporary labels will be used.

RESPONSE:

A procedure will be established for determining how temporary labels will be used. This procedure should limit the use of temporary labels as much as possible. This procedure is needed to allow the proper and effective use of temporary labels.

IMPLEMENTATION:

By completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

I NO.: 0197/0082

12 HED NO.: 6.5.2.B.3-7

CATEGORY: 1 LEVEL: C

FINDING:

There is no review procedure for determining the content of temporary labels.

RESPONSE:

A procedure should be established to determine and control the content of temporary labels. This procedure should provide guidelines to limit the content of temporary labels to only necessary information.

IMPLEMENTATION:

By completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

IN NO.: 0201/0086

12 HED NO.: 6.5.2.B.7-15

CATEGORY: 1 LEVEL: C

FINDING:

There is no review procedure in place for determining any retraining requirements that result from the use of temporary labels.

RESPONSE:

A procedure will be established for determining the retraining requirements as a result of the use of temporary labels.

IMPLEMENTATION:

By completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

IN NO.: 0202/0087/0203

12 HED NO.: 6.5.2.B.8-17/6.5.2.B.8-19

CATEGORY: 1 LEVEL: C

FINDING:

There is no review procedure for the determination of a periodic review of temporary labels and when they should be removed.

RESPONSE:

A procedure will be established for the periodic review of temporary labels and when they should be removed. This procedure will review the continued need for the use of a temporary label and would be used to keep temporary labeling up to date, accurate, and also hold their use to a minimum.

IMPLEMENTATION:

By the completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

IN NO: 0055, 0056

12 HED NO.: 6.6.1.A-1, 6.6.1.B-2

CATEGORY: 2 LEVEL: C

FINDING:

Lines of demarcation are not permanently attached and do not contrast well with the panel background. Sufficient contrast can improve the identification of systems and subsystems. Photo Log (B-20)

RESPONSE:

The placement of permanent lines of demarcation will be addressed as a function of a systematic enhancement of the control room. These lines will contrast well with the background.

IMPLEMENTATION:

By the completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

IN #: 0032 _____

12 GUIDE NO.: 6.6.1.B-5 _____

CATEGORY: _____ LEVEL: _____

FINDING:

Lines of demarcation are not permanently attached. Permanent lines of demarcation can ensure against inadvertent removal. Photo Log (C-16)

RESPONSE:

Characteristics of lines of demarcation will be addressed in the implementation of a consistent control room enhancement package.

IMPLEMENTATION:

By completion of the second refueling outage.

4424/c/10

DRESDEN CORRECTIVE ACTIONS

INSTR. NO.: 0184

12 HED: 6.6.2-1

CATEGORY: 1 LEVEL: C

FINDING:

Label color is not dedicated to specific functions or conditions throughout the control room.

RESPONSE:

A system will be developed for use of color in labeling in accordance with principles given in guideline 5.1.6. This system will be coordinated with the color coding system developed for the whole control room.

In general, system will adopt labels all of one color with lettering of good contrast (e.g. black lettering on white labels). Other contrasting colors will be used in the background for demarcation and for mimics.

IMPLEMENTATION:

By completion of the second refueling outage.

4385/c/23

DRESDEN CORRECTIVE ACTIONS

IR NO.: 0076

12 HED NO.: 6.6.2-2

CATEGORY: 1 LEVEL: C

FINDING:

Label color is not dedicated to specific functions or conditions throughout the control room.

RESPONSE:

Color code standards will be developed and applied to the labeling page to make the use of color consistent throughout the control room.

IMPLEMENTATION:

By the completion of the second refueling outage.

INDEX NO.: 0185, 0077

12. ID: 6.6.3.A.1-12

6.6.3.A.1-13

CATEGORY: 1 LEVEL: C

FINDING:

Mimic line flow paths are not color coded in conformance with guideline 5.1.6. Within a given system, color coding of mimics is used. However, this is not consistent across systems. (Photo Log J-10, J-11)

RESPONSE:

In developing the enhancement package, colors selected for mimics will contrast well with background as well as between colors for different flow paths. Principles stated in guideline 5.1.6 will be followed whenever possible.

IMPLEMENTATION:

By the completion of the second refueling outage.

43/21

DRESDEN CORRECTIVE ACTIONS

IN NO.: 0057

12 HED: 6.6.3.A.2-1

CATEGORY: 1 LEVEL: C

FINDING:

The mimic colors are not sufficiently different from the background to readily be discriminated. Increased contrast between mimic lines and background would greatly enhance operator's ability to follow and identify flow path. (Photo Log B-21)

RESPONSE:

In developing the enhancement package, the colors for mimics will be selected so that they give good contrast to the control board background and to colors representing different components in the mimics.

IMPLEMENTATION:

By completion of the second refueling outage.

4385/c/16

INDEX NO.: 0033

12. 6.6.3.A.2-6

CATEGORY: 2 LEVEL: C

FINDING:

Mimic colors are not discriminately different from each other. Orange, red, and beige are used on one general mimic array. (Photo Log I-31)

RESPONSE:

In developing the enhancement package colors for mimics will be selected so that they give good contrast to the control board background color and to colors representing mimic components.

IMPLEMENTATION:

By the completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0058

12 HED: 6.6.3.A.3-2

CATEGORY: 1 LEVEL: C

FINDING:

There is an inadequate contrast between the mimic colors and the panel. On panels 902-8 and 903-8 electrical mimics are yellow colored contrasting poorly with the beige panel color. There are also beige mimics. On panels 902-3 and 903-3 the HPCI mimic contains yellow contrasting poorly with the beige panel color. (Photo Log B-22)

RESPONSE:

In developing an enhancement package, the colors for mimics will be selected so that they give good contrast to the control board background color and/to colors representing different components in the mimic.

IMPLEMENTATION:

By the completion of the second refueling outage.

4385/c/68

INDEX NO.: 0034

1. 6.6.3.A.3-7

CATEGORY: 2 LEVEL: C

FINDING:

There is inadequate contrast between mimic colors and the control panel. Beige mimics appear on the beige panel. (Photo Log C-20)

RESPONSE:

In developing the enhancement package, colors for mimics will be selected so that they give good contrast to the control board background color and to colors representing various mimic components.

IMPLEMENTATION:

By the completion of the second refueling outage.

DRESDEN CORRECTIVE ACTIONS

WORK NO.: 0063

12 HED: 6.6.3.A.3-10

CATEGORY: 2 LEVEL: C

FINDING:

There is inadequate contrast between the mimic colors and the panel. Colors for electrical flow paths are a medium beige applied against a light beige control panel. Discriminability of colors enhances the identification of flow path by the operator. (Photo Log I-24)

RESPONSE:

The use of color on mimic lines will be reviewed during the development of the mimic package. A color code standard will be established and incorporated into the mimics where appropriate to ensure adequate contrast.

IMPLEMENTATION:

By the completion of the second refueling outage.

4/11/9

DRESDEN CORRECTIVE ACTIONS

IN NO.: 0186

12 HED NO.: 6.6.3.A-4

CATEGORY: 1 LEVEL: C

FINDING:

Mimic lines depicting the flow of the same contents are not the same color. Standardizing with color helps with easy identification of contents across systems. (Photo Log J-10, J-11)

RESPONSE:

A package of mimic enhancement will be prepared. Color code standards will be developed and applied to mimics throughout the control room.

IMPLEMENTATION:

By completion of the second refueling outage.

INDEX NO.: 0186

1. ID: 6.6.3.A.4-14

CATEGORY: 1 LEVEL: C

FINDING:

Mimic lines depicting the flow of the same contents are not of the same color. (Photo Log J-10, J-11)

RESPONSE:

An enhancement package will be developed such that mimic lines depicting the flow of the same contents will be of the same color. Moreover, colors used for specific contents across systems will be standardized in the enhancement package.

IMPLEMENTATION:

By the completion of the second refueling outage.

4 c/24

DRESDEN CORRECTIVE ACTIONS

IN NO.: 0078

12 HED: 6.6.3.A.4-15

CATEGORY: 2 LEVEL: C

FINDING:

Mimic lines depicting the flow of the same contents are not the same color. Standardizing with color helps with easy identification of contents across systems. (Photo Log J-17, J-18)

RESPONSE:

The use of color on mimic lines will be reviewed during the development of the labeling package. A color code standard will be established and incorporated into the mimics where appropriate.

IMPLEMENTATION:

By the completion of second refueling outage.

4385/c/10

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0059

12 HED NO.: 6.6.3.B.3-3

CATEGORY: 2 LEVEL: C

FINDING:

Flow directions on mimics are not clearly indicated by distinctive arrowheads. Photo Log (B-23)

RESPONSE:

Flow path mimic arrows will be installed on the appropriate systems.

IMPLEMENTATION:

By completion of the second refueling outage.

4425/c/20

DRESDEN CORRECTIVE ACTIONS

IN NO: 0035

12 HED NO.: 6.6.3.B.3-8

CATEGORY: 2 LEVEL: C

FINDING:

Flow directions are not clearly indicated by distinctive arrow heads for the standby gas treatment system.

RESPONSE:

Flow direction arrow heads will be included on the stand by gas treatment system as a function of the control room enhancement program.

IMPLEMENTATION:

By the completion of the second refueling outage.

442/c/2

DRESDEN CORRECTIVE ACTIONS

INDEX NO.: 0178

12 HED NO.: 6.6.3.B.4-10

CATEGORY: 2 LEVEL: C

FINDING:

From where the mimic begins it is not clear where it is coming from. This may cause some confusion as to the nature of flow of the system. (Photo Log B-28)

RESPONSE:

In some cases there is a lack of a starting label (that is, that there are several other mimic lines coming out of the same position). The green mimic is just ended at one of these other mimics implying that it follows the same flow path. The operators understand the implied system conceptualization and have no difficulty in following the mimic.

IMPLEMENTATION:

Accept as is.

4425/c/21

DRESDEN CORRECTIVE ACTIONS

IN NO: 0179 _____

12 HED NO.: 6.6.3.B.5-11 _____

CATEGORY: 2 LEVEL: C _____

FINDING:

The mimic line leading out of the clean-up filter and clean-up filter bypass valve is not labeled. This may cause confusion as to the nature of the flow of the system.

RESPONSE:

This filter will be labeled properly as a function of the control room labeling program.

IMPLEMENTATION:

By the completion of the second refueling outage.

4424/c/3

DRESDEN CORRECTIVE ACTIONS

INDEX NO: 0060, 0036

12 HED NO.: 6.6.3.B.6-4/6.6.3.B.6-9

CATEGORY: 2 LEVEL: C

FINDING:

Component representatives on component lines (i.e., pump, condenser, turbine mimics) are not identified. (Photo Log B-24)

RESPONSE:

As part of the control room enhancement package, component representatives and component lines will be identified.

IMPLEMENTATION:

Before completion of the second refueling outage.

4424/c/1