VOGTLE ELECTRIC GENERATING PLANT NUCLEAR OPERATIONS STATUS OF CONTROL ROOM DESIGN REVIEW, HUMAN ENGINEERING DISCREPANCIES AND SIMILARITY REVIEW REMAINING ISSUES MAY 1, 1989

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# GEORGIA POWER COMPANY Status Of Control Room Design Review, Human Engineering Descrepancies And Similarity Review Remaining Issues

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#### 1.0 Control Room Surveys

#### 1.1 Ambient Noise Survey

This survey was completed on Unit 1 and 2 after Unit 2 fuel load. Results were as follows:

Ambient Noise	Unit 1	Unit 2		
Ambient Sound Level:	59 db	58 db		
Annunciator Alarm Reset Bell:	80 db	80 db		
QMCB Section A Annunciator Tone:	64 db	62 db		
QMCB Section B Annunciator Tone:	62 db	63 db		
QMCB Section C Annunciator Tone:	64 db	63 db		
QEAB Annunciator Tone:	64 db	67 db		
QHVC Annunciator Tone:	59 db	64 db		

Three previous Human Engineering Discrepancies were resolved:

HED 1321 - Background noise (60 db) may impair verbal communication between two points in the primary operating area.

Removal of a temporary wall and ventilation modifications decreased the ambient noise level below 60 db. No further action is planned.

HED 1322 - The annunciator alarm tones may not permit operators to reliably discern them above the ambient control room noise. The main control board alarms are less than + 10 db above ambient noise levels.

> Alarms are 3 to 9 db above background, except for the Unit 1 QHVC panel (a back panel). The QHVC alarm will be raised to the same range by May 30, 1989. Although the other alarms are below the + 10 db guideline, they are clearly audible. Operators complained of the tigh noise level interfering with communications when alarms were at the + 10 db level. We intend to maintain sound levels in this range + 3 to + 9 db to avoid degrading operator performance.

HED 1323 - The annunciator reset bell sound level ( 85 db) exceeds the guideline nominal value of + 10 db above ambient.

HED 1323 was categorized as a level 3 (easy to correct) and the bell was muffled to 80 db. No operator complaints have been received.

#### 1.2 HVAC Surveys

1.2.1 Temperature and humidity surveys were performed in March 1989 after the Unit 1/2 control room ventilation was in a normal configuration. The results were:

		TEMPER	ATURE	°F(dry bulb)		HUMIDITY		ITY	%
		CONTROL	RANGE	MAX	MIN	R/	N	GE	
Unit	1	72 -	74	79	72	45	-	66	
Unit	2	74 -	76	81	69	46	-	70	

The max and min values were due to transient conditions during equipment testing; the control range indicates the normal temperature range. These data are for consecutive 7 day recordings in each control room.

These results are slightly below the NUREG 0700 temperature guidelines; however, the two control room areas have separate thermostats which are used by the operators to adjust temperature at their discretion within the Technical Specification limits. In a spot survey of eight operators, two wanted the rooms cooler, two wanted warmer, and four were satisfied. Given the individual variation in this comfort assessment, and the temperature control option the operators have, no further action is planned on temperature control.

1.2.2 Survey of control room personnel revealed a ventilation problem at the fire alarm computer station, which is normally continuously manned by a Fire Protection Technician. A large supply duct at the Process Control Panel (QPCP) behind the Main Control Board (QMCB) creates a floor level draft at that workstation. Five of five technicians cited the draft as a major discomfort. The workstation will be reconfigured by August 1989. If that does not correct the condition, an engineering modification to the duct work will be initiated.

### 1.3 INDICATOR LIGHT BULB SURVEY

A survey of the control panels was conducted to identify any safety related indicators which have a single light bulb indication, such that a burned out bulb could be misinterpeted as a false indication of equipment status. The following items were identified:

Refueling Water Storage Tank Safety Injection Test light ZL-40135 Centrifugal Charging Pump Lube Oil Pump 'ON' light ZL-40136 Lockout Handswitches for 8 valves, normally off lights Diesel Generator Sync Permissive lights (2) Diesel Generator 'Droop' Mode light ESF Buss Voltage Indicator Lights Containment Hydrogen Monitor status lights Control Room Isolation Reset Handswitch indicator light HS-12195b/12196b

- 1.3.1 The refueling water storage tank safety injection test light indicates the status of a safety injection signal allowing semiautomatic swapover of the emergency cooling pump suctions to the containment sump following a design basis loss of coolant accident. This signal status is also available on another light box indication and the function is backed up by a specific annunciator to trigger operator actions in the emergency operating procedures. Since this indicator is designed to support testing rather than operation, and given the redundant indications and triggers for operator actions, no action is planned on this item.
- 1.3.2 The auxillary lube oil pumps for the centrifugal charging pumps are not required for emergency operation. The oil pumps prelube the bearings to reduce wear in normal operation. Since the oil pumps have no safety function and normal operation is supported by an operator locally inspecting the pumps and starting the oil pumps, no action is planned on this item.
- 1.3.3 Eight emergency cooling valves have lockout switches which are normally off to prevent erroneous valve operations. The lockout is turned 'on' to permit valve operation. Since the lockout light is redundant with the adjacent handswitch position and the loss of indicator bulb would not affect valve operation, no action is planned.
- 1.3 4 The diesel generator syncronizing permissive lights indicate matched phase angles allowing closure of the emergency diesel generator output breaker to the emergency electrical bus when offsite power is available. The sync permissive light has no function during normal or emergency automatic operation of the diesel, and manual operation is supported by an adjacent syncroscope meter. Based on these features, no action is planned on this item.
- 1.3.5 The 'DROOP' mode light indicates that the emergency diesel generator frequency regulator is set up to operate the diesel in parallel with offsite power for testing. In standby status and in emergency operation the regulator operates in a 'UNIT' mode without offsite power. The indication does not affect automatic diesel operation in the event of a loss of offsite power or a safety injection. In either case the diesel will start and automatically shift to the 'UNIT' mode. The operator monitors diesel operation using the voltage and frequency meters on the panel, not this light. No action is planned on this item.

- 1.3.6 Bus potential lights indicate the presence of phase voltage and control power for emergency power supplies. Although each bulb is a single indicator there are two or three for each buss, continuously lit when the buss is energized. Bus voltage is also available using a panel voltmeter. Since these lights are normally lit, are redundant, and have no active function, no action is planned.
- 1.3.7 The containment hydrogen monitor status lights are operating mode lights which show the operating state of these monitors. The indicators follow control switch positions on the same panel and have no operating function. No further action is planned.
- 1.3.8 The control room isolation (CRI) reset handswitches are used to override and reset a control room isolation signal. The light comes on when a control room isolation signal is present and the handswitch is moved to reset. If no actuation signal is still present, the light then goes out. This indication is only used for testing and during restoration to a normal lineup after a control room isolation has occurred. If the lamp burned out, the operator should notice the malfunction when the switch was reset (i.e. the light would not come on). If the operator missed that, an alarm condition would continue on the main control board to alert the operator to the uncleared CRI signal. Based on lack of operational impact for bulb failure, opportunity for operator detection of burnout, and alarm status to detect a reset failure, no action is planned on this item.

# 1.4 CUMULATIVE EFFECTS HED OPERATOR SURVEY EVALUATION STATUS

# 1.4.1 HED's With Additional Corrective Action Indicated

1038 The left hand corner of panel 1B1 is too crowded, and there is no direct indication for the SG blowdown valves (HS-7603 A, B, C, D). This indicator is on the QPCP.

Problems with steam generator blowdown operation were reported by 36% of the operators. The problems were with the control valves being on a back panel with the isolation valves in front. The procedures address this and good performance has been achieved. Verification of blowdown isolation was not a problem since those valves are on the main board. No action is planned to modify the Control Room; however, the survey indicated a problem in communication when transferring control from a field panel. A change to the communications system is being processed to add communications at the blowndown panel. This change will be installed before or during the 1990 refueling outage for each unit.

1103 Blue light on RCP lift oil pump does not have a legend describing blue light function.

21% of the operators felt a label for this light would be useful. We have added a light legend to the handswitch engraving.

1222 In the event of a reactor trip, the tile associated with the event illuminates. Other tiles illuminate, counter to 0700.

Ten percent of operator surveys indicated a problem with this annunciator. Engineering work is in progress to provide a separate acknowledge/reset control for this annunciator, since some comments concerned the loss of first out data when the other annuciators sharing a control were reset. This change should largely alleviate the problem. Since this annunciator provides the primary operator information on the occurrence of a Safety Injection after reactor trip, in support of the Emergency Operating Procedures, no further action is planned, beyond the individual control. The modified control will be installed before or during the 1990 refueling outage for Unit 2 and 1991 for Unit 1. 1223 There is no turbine trip first out. Turbine trips on ALB19 and ALB20 are not first out annunciators, as recommended in 0700.

Fifty percent thought a turbine trip first-out annunciator would be a benefit but some pointed out that the turbine Electro-Hydraulic Control (EHC) panel in the control room also provides this information on a back panel. Since the cause of a turbine trip is not needed immediately to establish stable control of the reactor plant, the back panel location is sufficient. However, this information is not used effectively. The reactor trip review procedure was revised to collect turbine first-out trip data from the back EHC panel if a turbine trip causes a reactor trip.

1226 There is no silence feature in the annunciator system, as distinct from acknowledge.

The lack of an alarm silence feature was cited in 50% of survey results as a problem. The high noise level set to achieve the NUREG-0700 guidelines coupled with the large number of alarms after a plant trip makes this a significant distraction to the operators. However, many feel that the ability to silence back panel alarms would increase the probability of not following up on an alarm condition. A silence feature is being considered. A prototype is installed in the simulator to silence all alarms for 45 seconds each time the silence button is pushed. After 45 seconds the audible alarms return. This trial will be evaluated by operator survey and an implementation decision made by August 1989. If implemented, completion will be during 1990 refueling outage for Unit 2 and 1991 for Unit 1.

1237 The ERF computer does not provide a sequential history file of operator entries available upon request.

This feature was desired by 21% in the operator survey, but evaluation of amplifying remarks showed that they were actually wanting more saved or pre-formated ERF trend displays for operator callup. A software change was made to provide an expanded menu of preformated trends, and to save a display for later recall. 1240 The proteus operating procedure 13504-1, Rev. 0 does not describe the overall computer system, and the computer system components with which the operator can interface.

Twenty-one percent of operators reported problems with the Proteus computer operating procedure. The problems stem from the brief treatment of normal operations in the procedure, and the relatively difficult operator interface software. The procedure has been revised to address these problems.

1250 Multiple ERF page considerations, when pages are organized in a hierarchical fashion, containing different paths through a series, a visual audit trail of the choices made are not available upon operator request.

This feature was desired by 21% in the operator survey, but evaluation of amplifying remarks showed that they were actually wanting more saved or pre-formated ERF trend displays for operator callup. A software change was made to provide an expanded menu of preformated trends and to 'save' a display for later recall.

1259 The impulse pressure indicators PI-505/506 on 1B1 are difficult to locate. They are in an area of many similar instruments.

Fifty percent expressed difficulty in locating the turbine impulse pressure indicators. This meter pair was marked with a white (black letter) label to highlight it from the surrounding black labels. Since this is the only such white label on the panel it serves to help visually locate the instruments.

# 1.4.2 HEDs With Additional Evaluation Indicated

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1040 HS-5208, HS-5209 & FIC/FI-4499 are not in close proximity to the main feed pumps.

Problems were reported by 28% of operators, specifically with main feed pump speed controls, the transfer from manual to automatic control, and the slight difference in A and B instrument arrangement. The speed control/transfer problems are actually related to operating procedures which were revised to clarify speed control/transfer. The arrangement of instruments cannot be modified since the board is full. No further action is scheduled.

1047 The set-point knobs for the controllers do not have directional markings.

The problems operators expressed with controller potentiometer settings (42%) were not related to the lack of a directional arrow but to a broader problem of controller conventions. A "process" convention was chosen in the CRDR; the "UP" button and a higher potentiometer setting should increase the process parameter (level, temperature, etc.) being controlled. Since this characteristic is not visible at the board, the DCRDR process was not able to verify conversion/correction. Based on the survey results, there may be multiple problems in this area. An engineering study is underway to verify and correct the implementation of a "process" controller convention. All corrections will be complete during the 1990 refueling outages.

1114 One CCW & NSCW pump light is normally off (MLB) in a block of "ON" lights for SI. RO's prefer this as it gives status of ESF for all pumps on MLB. The alternative is to delete the 3rd pump light (2 normally start).

Only 14% felt that this was confusing or caused misinterpretation. However, since these are used to facilitate rapid evaluation of a safety injection, a review was conducted to determine the technical feasibility and cost of replacing the three light display with a 2 of 3 logic for a system status light. This was feasible for less than \$10,000 per unit. This change will be completed by the end of the 1990 refueling outage for Unit 2 and 1991 for Unit 1. 1244 System status feedback, the proteus does not provide feedback to the operator as to computer system status (i.e. run, stop, failed, on line).

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Sixty-Four percent of the survey indicated a problem with this. The Proteus fails with the current display; data is not updated and the clock on screen stops changing. The failure is not obvious until the clock error is noticed or some operator input is attempted. By contrast the ERF computer screen blanks out after a 15 second interruption of computer data. An Engineering review to develop a computer failure indication found no easy way to implement this function with programming. This computer system will be replaced eventually to correct this HED and upgrade control room computer capabilities.

1282 All annunciators should be recorded on hard copy and where multi-input annunciators are used an alarm printout should identify the individual alarm inputs in the alarm condition.

Only 39% felt such a feature would be beneficial. Others cited problems with noise, printer reliability, and review time against such a feature.

An engineering review determined that hard copy capability would require almost complete system replacement for approximately \$1.1 million. Since this function is already provided for reactor protection alarms by the Proteus computer typer, no further action is planned.

1318 The following parameters, as identified in the ICCR, are not indicated in the control room: 1) RCP seal INJ temp, 2) RCP ACCW thermal barrier flow, 3) CCW flow to RHR HX, 4) Spent fuel pool level, 5) Spent fuel cooling water flow.

Ten percent of operator surveys indicated a desire for control room indication of spent fuel pool level. However no spent fuel was present and the pool was drained, so the desire was strictly hypothetical, not based on actual operations. An engineering review was performed to determine the technical feasibility of providing a control room display of this level. This addition would require extensive plant modification to add sensors and wiring, totaling \$140,000. Since a spent fuel pool level alarm is already located in the control room, there is no operational need for a level indication. No further action is planned.

## 2.0 UNIT 1/2 CONTROL ROOM SIMILARITY REVIEW

#### 2.1 CONTROL ROOM LAYOUT

Vogtle Units 1 and 2 share a common Control Room. The controls in both units are essentially identical with minor differences as described in the following:

The Unit 2 Main Control Board (QMCB) is a rotated image of the Unit 1 Main Control Board. On sections A, B, and C of the Main Control Board the left-right relationship for all the controls and displays is identical. This identical relationship for the A, B, and C section includes the board layout and labeling.

The one exception to identical layout on the Main Control Board is the D section. The D section was a backfit after the control room design was completed and floor space did not allow an identical arrangement. Section D contains the same equipment on both units (RVLIS, PSMS, and Main Steam Bypass Isolation Valves). Section D is on the left end of section A on Unit 1 and to the right of section B on Unit 2. This requires looking left on Unit 1 and right on Unit 2 to verify that the Main Steam Bypass Isolation Valves are shut on a Main Steam Isolation. There should be no impact on routine unit operation.

The rest of the Unit 2 Control Boards appear as if the Unit 1 Boards were moved west. Their appearance on Unit 2 are the same as on Unit 1 if your are standing in front of them. The Electrical Auxiliary board (QEAB) appears somewhat different from the center of the Control Room. In Unit 1 it is over the right shoulder and in Unit 2 it is over the left shoulder. This requires a slightly different scanning pattern during immediate operator action in the EOPs but should have no impact on unit operation. The high voltage section of the QEAB is different to reflect the differences in the switchyards but the Unit 2 inplant distribution systems appear identical to Unit 1. The common distribution system is on the Unit 1 QEAB.

The QPCP (Process Control Pawel) and QHVC (Ventilation Panel) in Unit 2 do not have the shared system controls located on Unit 1. These systems (fire pumps, river make-up, auxiliary boiler, etc.) are controlled by the Unit 1 crew in support of both units. A security wall was erected through the center of the common control room to separate Unit 1 from Unit 2 when Unit 1 Security went into effect. Original plans were for this wall to be removed when Unit 2 Security went into effect. Much of the wall was left to provide Unit separation and reduce inter-unit noise. The wall has been opened on the Shift Supervisors station, near the south door, and behind the QPCP.

#### Plant Computers

The plant computer (PROTEUS and ERF) terminals are in mirror image locations. The PROTEUS computer function is different in that no common inputs go to Unit 2. The ERF computer is identical except that the common radiation monitors and weather data are displayed only on Unit 1.

#### 2.2 SIMILARITY REVIEW

A detailed similarity review was conducted visually by comparing slides of Unit 1 with Unit 2. The review included but was not limited to the following:

- a) Labels
- b) Size of labels
- c) Hierarchial vs. non-hierarchial labels
- d) Information and abbreviations used on labels
- e) Information presented by ALB's, ZLB's Group Monitor Lights, etc.
- f) Physical layout of meters, recorders, controllers, ALB's, alarms, etc.
- a) Meter scales and markings
- h) Comparison of handswitch types
- i) Comparison of operator aids
- j) Color coding as pertains to escutcheon plates

Nine minor differences were found involving labels, ic. Press vs. pressure, HDR vs Header. These were determined to be minor in nature and no action is planned. In addition, twenty-eight differences in alarm panels (ALB) were observed. After checking procedures and P & ID's it was determined that the differences were due to field hardware differences, no action is planned. Some differences were identified due to Unit 1 HED inplementation not complete on Unit 2 at that time. For a list of differences that were not an HED or a minor label or ALB difference, refer to Appendix 1.

## 3.0 STATUS OF UNIT 1 CONTROL ROOM DESIGN REVIEW AS APPLIED TO UNIT 2

#### 3.1 HUMAN ENGINEERING DISCREPANCIES COMPLETE

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A Control Room walkdown was conducted to verify that previously identified Unit 1 HED's were applied to Unit 2. All but 35 Unit 1 HED corrections had been incorporated on Unit 2. Twenty two HEDs are in the process of correction (Appendix 2). Ten category 4 HEDs have no committed schedule for action, and may be worked in the future (Appendix 3). HED 1120, for additional phones at field panels, will be corrected in conjunction with HED 1038 (Section 1.4.1). Two HEDs 1196 and 1265 have no action planned (See section 3.4).

#### 3.2 HUMAN ENGINEERING DISCREPANCIES IN PROCESS OF BEING COMPLETED

The remaining 22 Unit 1 HED's will be applied to Unit 2 by the following schedule:

- 14 Maintenance Work Order Items By August 1989
- 2 Procedure Items By August 1989 (1233, 1234)
- 1 Software Revision By December 1989 (1236)
- 5 Maintenance And Engineering Items By The End Of The First Unit 2 Refueling (or before), (1048, 1148, 1221, 1236, 1320)

#### 3.3 CUMMULATIVE EFFECTS HEDs

Additional review of HEDs with no previously planned corrective action identified additional action planned for five HEDs (1038, 1222, 1226, 1047, 1114). See Section 1.4 for details.

#### 3.4 NEW CATEGORY 4A HED - NO ACTION

Two HEDs were reviewed and determined to be insignificant; no action is planned.

- 1196 This HED was to add an auto start of boric acid transfer pumps when emergency boration valves are opened. The two step process to open the valve and start the pump is covered in training and no operator problems have been noted in the simulator. Modification to the control system would be complex and expensive. No action is warranted.
- 1265 Anti glare screens will not be installed on CRTs in the main control panel. No seismic glare screen vendor was located, and glare on the two screens has not been a problem due to the lighting design. No action is planned.

## 4.0 CONTROL ROOM MODIFICATIONS

Plant procedures and practices are in place to ensure that future control modifications preserve human factors considerations in the current design and avoid the introduction of new Human Engineering Discrepancies.

#### Modifications

Control room modifications are controlled by Plant Administrative Procedure 00400-C "Plant Design Control" and Engineering implementing Procedure 50007-C "Engineering Review of Design Change Packages". Procedure 50007-C requires all design changes which may affect human factors considerations to be evaluated using the checklist provided as Data Sheet 15 of procedure 50007-C. This check is performed by responsible plant engineers to ensure the guidelines of NUREG-0700 are maintained. The checklist is used to screen for changes in the operator interface and to compare the change to the appropriate section of NUREG-0700.

The human factors review of changes extends beyond the Control Room. All changes to operator interfaces are reviewed against NUREG-0700. Since many field and some Control Room situations are not covered by NUREG-0700, other human factors guidelines published by the Electric Power Research Institute are used as secondary standards.

#### Unit Differences

Georgia Power's policy is to maintain the Unit 1 and 2 plants in the same configuration. Design changes developed for either Unit will generally be implemented on both Units.

# GEORGIA POWER COMPANY

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# APPENDIX 1

# UNIT DIFFERENCES FOUND DURING SIMILARITY REVIEW

UNIT 1	UNIT 2	RECOMMENDATION/STATUS
Group 4 Monitor Lights Train A & B, Cubes A14, B14 & C14 are engraved.	Blacked Out	OK, Equipment not monitored on Unit 2.
No covers	Plastic covers on the following: 2HS-12111A 2HS-12111B 2HS-12113A 2HS-12113B 2HS-12126 2HS-12126 2HS-12127 2HS-12114 2HS-12115	U-1 will install covers following Engineering review.
1-ZLB2 Monitor lights 5.1 and 5.2 main feed pump turning gear status	Blank	OK, U-2 has a different model turning gear without these lights. No action unless U-1 gear requires replacement.
Panel Al has two spare handswitches abandoned in place.	Switches removed. Holes blanked.	These switches will be removed on Unit 1.
Boron injection Tank pressure indicator on A2 panel	B]anled	OK This equipment not installed in Unit 2

### GEORGIA POWER COMPANY APPENDIX 2 UNIT 1 HUMAN ENGINEERING DISCREPANCIES IN PROCESS OF BEING COMPLETED ON UNIT 2

HED NUMBER	ORIGIN	HED DESCRIPTION	CATE-	PROPOSED RESOLUTION	STATUS
1020	1982 PRELIMINARY CRDR (HED 237), PR 70, 0700 (6.3.2.1)	THE ALARMS ON THE QEAB AND QMCB PANELS SOUND OFF WITH THE SAME TONE, AND THERE ARE NO DIRECTIONAL CUES FOR THE ALARMS ON THE QMCB.	02	ADJUST TO DIFFERENT TONES. ADD HORNS TO MCB A AND B FOR THEIR ANNUNCIATORS.	NEW HORNS IN, ONE NEEDS READJUSTED.
1048	1982 PRELIMINARY CRDR (HED 406)	COLOR CODING HAS NOT BEEN UTILIZED TO DE- FINE NORMAL LIMITS FOR OPERATIONAL PARAMETERS.	03	ADD GREEN BAND TO METER FACE.	MWO - FIRST REFUELING
1070	ANTHROPOMETRIC SURVEY (AS-12)	ANNUNCIATORS ARE ABOVE THE RECOMMENDED HEIGHT FOR VERTICAL BOARDS.	03	MILL ANNUNCIATOR HOODS ON QPCP, QHVC AND THE QEAB TO EXPOSE THE LOWER LINE OF ENGRAVING. NOT NEEDED ON QMCB DUE THE TILT OF THE ANNUNCIATORS FRAMES.	QEAB MISSED. MWO SUBMITTED.
1105	GENERAL PANEL CHECKLIST	NO LEGEND EXIST AS TO FUNCTION OF LIGHT ON HAND SWITCH (3 WHITE LIGHTS)	03	LABEL LIGHTS TO INDI- CATE FUNCTION	DONE, NEEDS REVISION IN SPACING
1121	TA SCENARIO 5A (NUREG 0700 6.3.2.2.)	PCP ALARM HORN IS NOT NOTICED UNTIL FRONT MCB ALARMS ARE SILENCED. NEEDS MORE DISTINCTIVE SOUND.	03	ADJUST PITCH TO DIF- FERENTIATE	DONE, NEEDS READJUSTMENT. MWO SUBMITTED
1148	TA E-O STEP 14 RNO	METER APPEARS TO BE LOG SCALE. 80 GPM IS NOT CLEARLY INDICATED.	03	WARK METER FACE TO SHOW 80 GPM. [1-FI-0930]	TO ENGINEERING. 1990 OUTAGE
1149	TA 27A STEP 6 FRC.1	BLUE PEN ON BACK OF RECORDER IS INVISIBLE. PUT RED PEN IN BACK, BLU IN FRONT. RO MISTOOK WID RANGE FOR UPPER HEAD SCALES. CONSIDER NAME CHANGE.	03 JE DE	PAINI BLUE PEN RED AND RED PEN BLUE, CHANGE INK COLORS AND RECORDER LEGEND PLate.	MWO SUBMITIZD

HED		C	ATE-		671711C
NUMBER	ORIGIN	HED DESCRIPTION	GORY	PROPOSED RESOLUTION	SUTATE
1156	TA SCENARIO 25A TST FRC.1 STP6	FULL, DYNAMIC, AND UPPER SCALE LEVELS ARE CONFUSING. SUP- PLEMENT RECORDER LABEL WITH RX VESSEL DIAGRAM. CONSIDER O BASE REFERENCE FOR FULL & UPPER SCALE. THIS IS ALSO A TRAINING ITEM. POST NORMALS FOR <4RCP.	03	POST MIMIC AND NORMAL DYNAMIC VALVES. MIMIC IS ON PSMS.	IN PLACE, OPS TO ADD STARTUP DATA BY AUG. 1989
1165	TA SCENARID 11A E-1 STEP 17	VALVES WITH LOCKOUTS CAN NOT BE READILY IDENTIFIED.	03	ADD "LOCK OUT" OR SYMBOL CODE TO HS PLAYE ADD "LOCK OUT" MANIPULATIONS TO PRDCEDURES.	OPS WORKING BY AUG. 1989
1210	COMMUNICATION SURVEY BY DAN NIELSON	INADVERTENT PUSHING OF TEST BUTTON DURING CASUALTY DISRUPTS OPERATIONS AND DISTRACTS ALL OPERATORS MOMENTARILY	03	GUARD TEST BUTTON WITH FLIP UP COVER.	PARTS ARRIVED. MWO SUBMITTED
1221	ENG, QUESTIONAIRE, HED 1141	MANUAL CONTROL ACTIONS ARE INCONSISTENT WITH POPULATIONAL STEREOTYPES, TRAINING, AND INDUSTRY CONVENTIONS. SOME CONTROL LERS RAISE THE PARAMETER ON PUSHING THE "UP" ARROW SOME DECREASE. LABELING I SOMETIMES MISLEADING.	03  IS,	REVISE CONTROLLER TO LET "UP" BUTTON RAISE THE PROCESS PARAMETER IN PROCESS CONTROLS AND OPEN VLV IN VLV CONTRLS. LABEL CLEARLY INDICATE PROCESS OR VLV CONTROL. SPLYMT DEMAND INDICATION WITH"OPEN" OR OTHER INDI CATION. MANUAL CONTROL OVERRIDE OR AUTO/	MOST DONE. ENGINEERING REVIE IN PROGRESS TO VERIFY & CORRECT ERRORS
1227	NUREG 0700 (6.3.4.2.)	ANNUNCIATOR CONTROLS ON THE QPCP & QHVC ARE NOT COLOR CODED DISTINCTIVELY QMCB USE WHITE, DIFFERENT FROM SWITCHES, BUT PCP & HVC HAVE ALL CONTROLS WHI AND QEAB IS MOSTLY BLACK.	03 (. ITE,	COLOR CODE THE ANNUN- CIATOR CONTROLS WITH AN ORANGE THAT IS OF A SHADE NOT TO BE CONFUSED WITH SAFETY INJECTION SYSTEM COLOR.	PARTS ARRIVED MWO WRITTEN.
1229	NUREG 0700 (6.6.2.1.)	QHVC METER BEZEL THICK- NESS FOR UPPER ROW OF METERS.	03	SPACE UPPER LABELS OUT WITH 5" PLASTIC STOCK	OPS WORKING - MWO WRITTEN.

HED NUMBER	ORIGIN	HED DESCRIPTION	GORY	PROPOSED RESOLUTION	STATUS
1233	OPERATING EXPER- IENCE REVIEW #33 LER-395-84037	DURING EOP VALIDATION AT SUMMER #1 A DIS- CREPANCY WAS OBSERVED BETWEEN THE S.G. WIDE RANGE AND NARROW RANGE LEVEL INDICATIONS AT 100% S.G. LEVEL. THIS SHOULD HAVE BEEN AN EX- PECTED RESPONSE, BUT WAS NOT COVERED IN OPR TRN. DATA BOOK HAS NO CON- VERSIONS.	02	ADD THE S.G. DISCRE- PANCY TO THE OPERATOR TRAINING PROGRAM AND PROVIDE INFORMATION FOR CORRECTING 'COLD' CALI- BRATED TO CORRESPONDING HOT PLANT STEAM GENERATOR LEVELS, IN THE PLANT DATA BOOK.	OPS WORKING,
1234	OPERATING EXPERIENCE REVIEW #14	SER 78-83 COMMENT #3 REMOVING ALARM INPUTS FROM PROCESS COMPUTER PERMITTED THE PLANT TO OPERATE OUTSIDE ESTAB- LISHED UNITS WITHOUT WARNING THE OPERATOR. NO ADMIN CONTROLS EXIST FOR REMOVAL ALARM POINT	02	ESTABLISH ADMINIS- TRATIVE CONTROLS FOR REMOVAL OF COMPUTER ALARMS BY THE OPERATOR. ADD TO ANNUNCIATOR STATUS PROCEDURE.	DONE. NEEDS IMPROVEMENT.
1236	CONTROL ROOM COMPUTER SURVEY N.R. 0700 6.7.1.2.	OPERATOR/COMPUTER DIALOGUE COMPUTER OUTPU TEXT USES ABBREVIATIONS AND CONTRACTIONS AND SHOULD BE AVOIDED.	03 T	ERF COMPUTER AND PROTEUS COMPUTER USE ABBREVIATIONS TO MATCH OTHER PLANT NOMENCLATURE AND MAXIMIZE INFORMATION IN ONE PRINT LINE. BOTH WILL BE REVIEWED FOR CONSISTENCY WITH PLANT ABBREVIATION AND ACRONYM LIST.	ERF DONE. CORRECT PROTEUS BY DEC. 1989.
1239	COMPUTER SURVEY N.R. 0700 6.7.1.4.	COMPUTER KEY BOARDS USE EXTRANEOUS KEYS AND SYMBOLS. PROTEUS (UNUSE KEYS & SYMBOLS) ERF (VIDEO COPY)	03 D	REMOVE EXTRANEOUS KEYS AND BLANK OVER HOLES.	OPS WORKING BY AUG. 1989
1288	OPERATOR QUESTION- AIRE 0080-12 & 0028-26	SOME MAIN CONTROL BOARD INPICATOR LENS WERE DAMAGED BY THE USE OF A CLEANING SOLVEN: AND AF NOW DIFFICULT TO READ.	03 RE	REPLACE INDICATOR LENS/ WINDOW WITH NEW NON- GLARE PART.	MOST DONE MWO WRITTEN FOR 10.

HED NUMBER	ORIGIN	HED DESCRIPTION GORY	PROPUSED RESOLUTION	STATUS
1313	QUESTIONNAIRE #0068-02-01	HS-9017B, THE RWST 02 SUPPLY TO CNMT SPRAY PUMP-B IS ONE SPACE TO THE LEFT COMPARED TO TRAIN A LAYOUT. MOVING THE HAND SWITCH ONE SPACE TO THE RIGHT WOULD IMPROVE THE TRAIN SEPARATION AND MAKE THE LAYOUT MORE CONSISTENT.	RELOCATE HAND SWITCH ONE SPACE 10 THE RIGHT.	THIS WILL BE CORRECTED WITH A MIMIC FLOW PATH BY AUGUST 1989.
1320	CONTROL ROOM EXPERIENCE	POSITION INDICATION 01 COLORS ON CONTROLLERS ARE INCONSISTENT IN MAINTAINING A DOWN, SHUT, GREEN CONVENTION.	CHANGE LIGHT COLORS ON ON VALVE CONTROLLERS SO SO THAT THE DOWN BUTTON SHUT & GREEN AND UP = OPEN = RED. DELETE THE COLOR ON NON VALVE CONTROLLERS AND TIC PROCESS CONTROLLERS WITH POSITION IND. ON PROCESS CONTROLLERS WITH OUT IND MAINTAIN RED=OPE REGARDLESS	SAFETY RELATED ITEMS DONE. REVIEWING TEMPERATURE CONTROL- LERS. CAT 2 ITEMS. BY END 1989 WITH HED 1221.
1322	NUREG 0700 (3.∠.1.a)	ANNUNCIATOR SOUND 03 LEVEL <+10 db ABOVE BACKGROUND	ADJUST.	ONE FAILED RETEST. MWO WRITTEN. SEE SECTION 1.1
1326	NUREG 0700 SEC. 6.2.1.5.c	PROCEDURES ARE NOT 03 ESTABLISHED OR POSTED FOR USE OF THE FIXED BASE TRANSCEIVER.	PLACE VENDOR INSTRUCT IN CONTROL ROOM.	INSTRUCTIONS IN MCR. LABEL ON ORDER.

#### GEORGIA POWER COMPANY APPENDIX 3 CATEGORY 4 HEDS NO ACTION SCHEDULED

1039 Main feed pump oil pressure meter location - These may be relocated if engineering review approves the deletion of other instruments on the main control board (feedwater nozzle delta temperature).

1052 Multipoint recorder replacement - will be replaced at end of and service life.

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- 1055 Ink cartridge replacement cartridge system is substituted on a case by case basis during maintenance.
- 1128 Nuisance alarms Engineering review is in progress to correct.
- 1140 Proteus alarm computer CRT controls location. This display is not used. Alarms now go to a printer. No action is planned until computer replacement.
- 1152 Low air pressure to containment alarm is not currently planned. There is already a low pressure air header alarm and an alarm if a containment isolation occurs, cutting - off air to containment. All equipment in containment fails safe on loss of air. No further action is scheduled.
- 1268 Proteus computer graphics rewrite will not be performed. This system will be replaced eventually.
- 1290 Air compressor handswitch replacement none planned.
- 1311 PERMS radiation detection computer printer deletion is planned.