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RECIP. NAME EISENHUT, D. G. RECIPIENT AFFILIATION Division of Licensing

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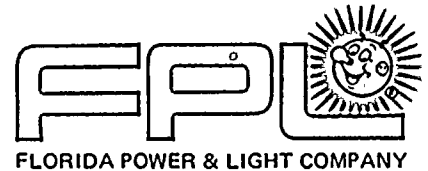
SUBJECT: Forwards modified responses to items submitted in 821029  
ltr, based on 821103 telcon w/NRC re control room design  
review per SER, NUREG-0843. Updated status of Items 3.1 - 3.8  
of summary human engineering rept encl.

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	NRR/DE/HGEB 30	1 1	NRR/DE/MEB 18	1 1
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	NRR/DHFS/HFEB40	1 1	NRR/DHFS/LQB 32	1 1
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	NRR/DSI/ICSB 16	1 1	NRR/DSI/PSB 19	1 1
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	<u>REG FILE</u> 04	1 1	RGN2	3 3
	RM/DDAMI/MIB	1 0		
EXTERNAL:	ACRS 41	6 6	BNL (AMDTS ONLY)	1 1
	DMB/DSS (AMDTS)	1 1	FEMA-REP DIV 39	1 1
	LPDR 03	1 1	NRC PDR 02	1 1
	NSIC 05	1 1	NTIS	1 1





November 10, 1982  
L-82-496

Office of Nuclear Reactor Regulations  
Attention: Mr. Darrell G. Eisenhut, Director  
Division of Licensing  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Dear Mr. Eisenhut:

Re: St. Lucie Unit No. 2  
Docket No. 50-389  
FPL/NRC November 3, 1982 Telecommunication  
On Control Room Design Review  
Supplement 1 of NUREG-0843

Attached are the agreed to modified responses to those items submitted in FPL letter L-82-477, dated October 29, 1982 based on a November 3, 1982 telephone communication between FP&L representatives and members of your staff. In addition, attached is an updated status of items 3.1 through 3.8 of Florida Power & Light Company's NTOL SUMMARY HUMAN ENGINEERING REPORT ON ST. LUCIE UNIT NO. 2 CONTROL ROOM (SUPPLEMENT #1).

If you have any questions regarding this submittal, please contact us accordingly.

Very truly yours,

*J. A. de Mastry*  
*for*

Robert E. Uhrig  
Vice President  
Advance Systems and Technology

REU/RJS/JES/jea

Attachments

cc: J. P. O'Reilly, Region II  
Harold F. Reis, Esquire

*Boo!*

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PDR ADOCK 05000389  
E PDR

**RECORD OF PHONE CONVERSATION**  
November 3, 1982

A conference call between Florida Power & Light representatives and representatives of the Nuclear Regulatory Commission Human Factors Branch was held on November 3, 1982 at approximately 8:30. The purpose of the call was to review and resolve any points of contention with regard to those items submitted to Mr. D. G. Eisenhut, Director, Division of Licensing under cover letter 82-477, dated 10/29/82.

The following is submitted to provide modified responses to SER Supplement No. 1 Appendix C Findings A.4.6, A.4.8 and A.6.10 as agreed to and provide additional information with regard to Sections 3.1 through 3.8 inclusive of Florida Power & Light's NTOL SUMMARY HUMAN ENGINEERING REPORT ON ST. LUCIE UNIT NO. 2 CONTROL ROOM (Supplement #1) dated October 28, 1982.

A. SER Supplement No. 1 Appendix C Finding A.4.6

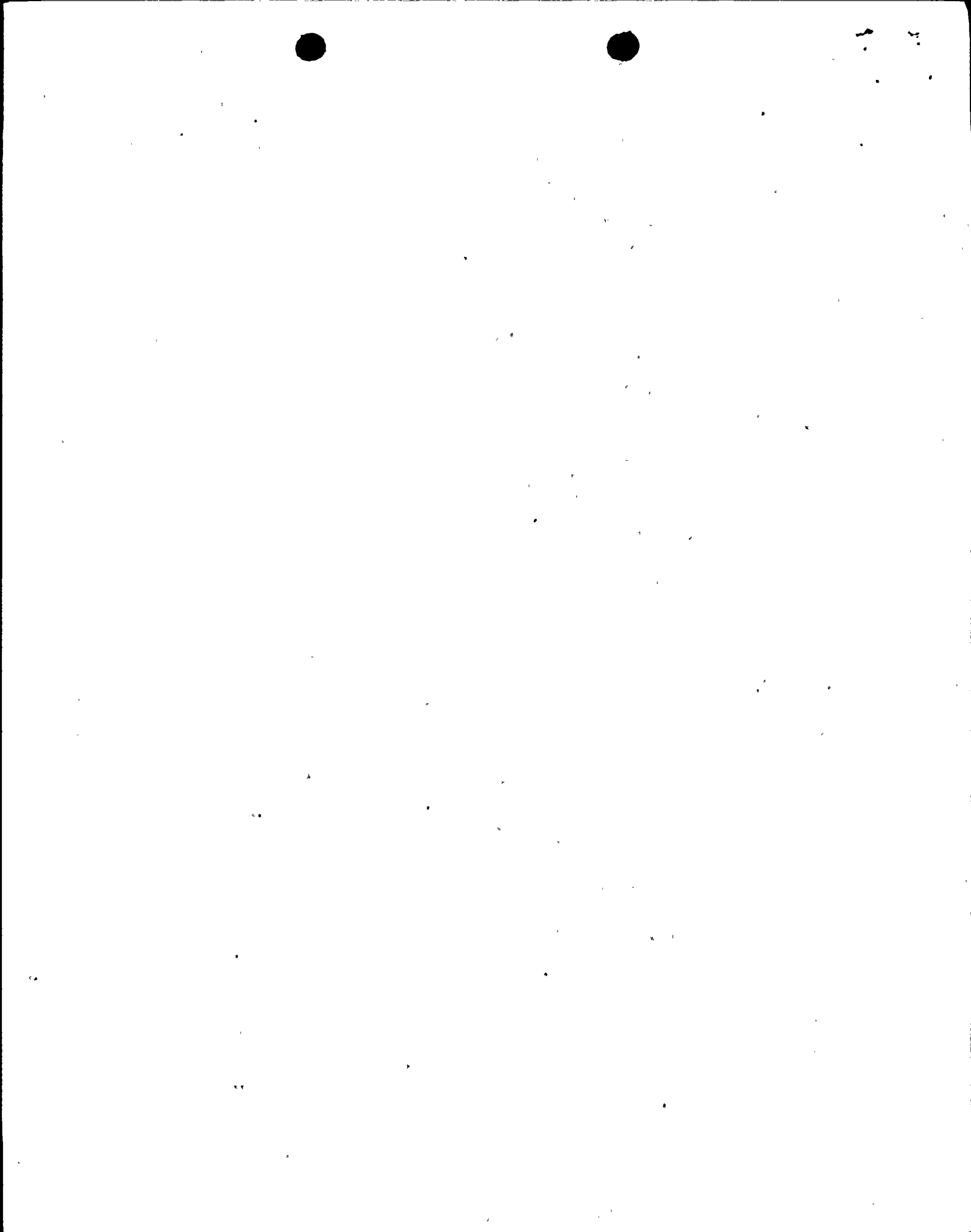
An engineering review of finding A.4.6 indicates that although a majority of the subject keylock switches were arranged on the control panels such that those valves which were in a locked open position had black key lock cylinders and those valves in a locked closed position had silver key lock cylinders that the reason for black and silver lock cylinders was that the manufacturer had changed production and the silver lock tumblers are no longer available. Thus all key locks which were later added had black lock cylinders. Presently, FP&L has labeled each switch to indicate its normal desirable position, i.e., locked open or locked closed and its alternative position i.e., closed or open. These switches are administratively controlled and presently FP&L does not intend to establish a code convention for the subject key lock switches. FP&L is further investigating the replacement of the silver tumbler key switches with black ones. Presently FP&L has requested that the subject silver tone keylock switches be painted with black enamel. It is anticipated that this effort will be completed in mid December of 1982.

B. SER Supplement No. 1 Appendix C Finding A.4.8

The proposed Matrix convention as identified under the previously submitted cover letter 82-477 dated October 29, 1982 has been modified such that drawings identifying existing backfit legends and pushbuttons and an administrative procedure will be used by the Control Room operator to identify the correct location of the subject legends and pushbuttons when performing lamp maintenance, i.e. bulb replacement.

C. SER Supplement No. 1 Appendix C Finding A.6.10

The original response in the subject SER stated ". . . as an interim measure prior to issuance of an operating license, demarcation will be used to make these items stand out. . ." After discussions with representatives from the Nuclear Regulatory Commission Human Factors Branch, FP&L has agreed to modify its response. The subject 8 recorders located on RTGB 206 were required to be powered from two independent safety related power sources. These recorders were located in their associated electrical trains to meet the separation requirements of Regulatory Guide 1.75. As an interim measure prior to issuance of an operating license, letters designating the recorders monitoring mechanical operating train will be affixed to the faces of the subject recorders. The letters will be black on a white background reverse engraved and one half (1/2) inch in height.



This letter coding in conjunction with operator training will act as an interim measure to inform the operators of the association of the proper controls and displays identified in this Finding.

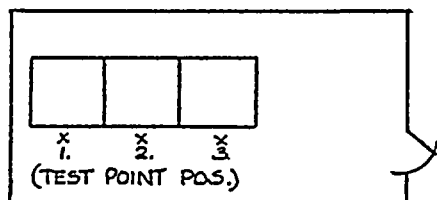
D. NTOL SUMMARY HUMAN ENGINEERING REPORT ON ST. LUCIE UNIT NO. 2 CONTROL ROOM (Supplement #1) Update of Sections 3.1 through 3.8 inclusive

D.1 (3.1) Control Room and Hot Shutdown Panel Environment

Lighting - A light survey of the Control Room was conducted during the month of August, 1982 with the results as stated in the NTOL Summary Human Engineering Report dated October 28, 1982. The emergency light levels were found acceptable and the normal AC light levels are to be reduced to approximately 50 ft. candle levels by switching off selected banks of AC lights not on the vital AC auto diesel load circuits. This effort is expected to be completed by the end of December, 1982.

A light survey of the normal AC and emergency D.C. light levels in the Hot Shutdown Panel area was completed on November 3, 1982. Light levels were measured at three levels of each vertical panel. The data are presented below:

Hot Shutdown Panel Room Diagram:



\*NOTE: Readings taken at (3) different positions directly in front of the panel and at (3) verticle points: 30", 50", 74" for each position. Measurements readings in ft.-candles.

LIGHT SURVEY FOR HOT SHUTDOWN PANEL ROOM

<u>Condition</u>	<u>Height</u>	<u>Position 1</u>	<u>Position 2</u>	<u>Position 3</u>
1. Vital A.C. (Normal) (A & B Diesel)	30"	26	35	41
	50"	30	38	44
	74"	16	36	50
2. A and B Battery (D.C.)	30"	49	60	55
	50"	65	85	65
	74"	92	105	75
3. A Battery/B Diesel (D.C. & A.C.)	30"	18	22	28
	50"	18	25	25
	74"	15	20	32
4. B Battery/A Diesel (D.C. & A.C.)	30"	38	48	30
	50"	60	70	39
	74"	90	100	52

Light levels in the Hot Shutdown Panel Room will be reduced for conditions 2 and 4 above by removing the reflector from the "B" DC light fixture and/or reducing the incandescent lamp size. Both proposals and a combination of the two will be evaluated and the one rendering the best overall illumination will be incorporated by the end of December, 1982.

Noise - A noise survey was performed in the PSL No. 1 Control Room and Hot Shutdown panel areas with the unit at Full Power. The results showed the sound levels to be within acceptable limits of NUREG 0700. The Control Room and hot shutdown panel location and relationship to large rotating equipment on PSL No. 2 is nearly identical to PSL No. 1 design and it is anticipated that very nearly identical results will be measured at Full Power conditions. The data taken for the PSL No. 1 Control Room were presented in the NTOL Summary Human Engineering Report dated October 28, 1982 and the PSL No. 1 hot shutdown panel area is summarized below:

<u>Workstation</u>	<u>Sound Level (dB-A Scale)</u>
Hot Shutdown Panel	63

Temperature and Humidity - A temperature and humidity survey of the PSL No. 1 Control Room and hot shutdown panel area were conducted. In the course of the PSL No. 1 assessment, no discrepancies from the NUREG 0700 guidelines were noted. The data collected was during the month of March for a period of 24 hours. The maximum temperature noted in the Control Room was 77 degrees with a maximum relative humidity of 47%. The maximum temperature noted in the hot shutdown panel area was 87°F with a maximum relative humidity of 60%. The conditions monitored in the Control Room were within NUREG 0700 Guidelines. The environment in the hot shutdown panel area is supplied with normal building ventilation and is felt to be adequate for the intended purpose. FP&L intends on conducting a detailed Control Room and Hot Shutdown Panel environmental survey as part of the Detailed Control Room Design Review effort as soon as the unit is operational at Full Power. These results will then be reported on in the summary report with any discrepancies found and corrective actions identified as part of the implementation program. Florida Power and Light Company feels this information satisfactorily supports the completion of the preliminary Control Room design review effort.

#### D.2 (3.2) Control Room General Layout

The Control Room general layout is as presented in the NTOL Summary Human Engineering Report dated October 28, 1982. As defined in the subject report, one of the Control Room engineering design integration team efforts was finalization of the PSL No. 2 Control Room incorporating input from FP&L's human factors consultant, operations and engineering disciplines to achieve the best utilization of space and minimize traffic interferences. FP&L expects the PSL No. 2 Control room to have all major equipment, desks, lockers and storage cabinets in place by mid-December 1982.

FP&L considers this portion of the preliminary Control Room design review effort to be complete with no human engineering discrepancies to be reported.

D.3

(3.3) Operators Consoles (Cardboard Mockups)

The operators console and communication console had been designed and reviewed as part of the Control Room engineering review team effort. Input from FP&L's human factors consultant, operations and engineering disciplines were incorporated to optimize the man machine interface and overall integration of the consoles into the Control Room environment based on tasks and personal staffing. The communications console is installed and the operators console is expected to be set in place by mid-December 1982. FP&L feels this portion of the preliminary Control Room design review effort to be complete with no human engineering discrepancies to be reported.

D.4

(3.4) Communications

Section 3.4 of the NTOL Summary Human Engineering Report dated October 28, 1982 describes the design effort with regard to the communications system. As requested, Table 3.4.1 describes the manufacturer and model number of equipment along with a description of their use within the Control Room environment.

In addition, an evaluation of the currently used respirators by the Control Room operators was performed using a speech intelligibility rhyme test. The standard MSA types were found to be unacceptable and MSA Speak Easy type respirators with an internal pickup and external amplifier and speaker were subjected to the same performance test and found to be acceptable. The MSA Speak Easy type respirators are on order and are expected to be delivered in early December, 1982. The Speak Easy respirators will be standard issue for Control Room operators.

FP&L feels the preliminary Control Room design review effort in this area is complete with no additional human engineering discrepancies to be reported.

D.5

(3.5) Control and Display Installations

As reported in section 3.5 of the NTOL Summary Human Engineering Report dated October 28, 1982, 99% of the planned controls and displays have been installed in the PSL No. 2 Control Room. All those controls and displays installed after the NRC site audit were reviewed for generic Findings as identified in Appendix C of Supplement 1 of NUREG 0843, Control Room Design Review (I.D.1). A human factors evaluation of layout design for specific board areas which were upgraded and/or modified to incorporate licensing commitments, TMI changes, and required system engineering changes was performed with no additional human engineering discrepancies noted. Since the remaining displays to be installed have undergone a human factor evaluation as part of the Control Room engineering design integration team effort all that is remaining is verification of installation in accordance with design documents. FP&L considers the preliminary Control Room design review effort in this area to be complete. Verification of the remaining 1% of subject controls and displays will be in accordance with current licensing commitments. Remaining equipment to be verified are:



1 - Operators Console - mid-December, 1982

2 - Inadequate Core Cooling display - \*Prior to O.L.

D.6 (3.6) Auditory Signal System

FP&L considers the present auditory signal in the Control Room to be acceptable since the annunciator Beta Tone audible devices are frequency, rate and audio output adjustable. Presently the devices have been adjusted in accordance with NUREG 0700 for present ambient noise conditions in the existing construction environment. As the plant becomes operational, the signal qualities will be adjusted to suite the operating ambient noise environment which is expected to be lower than that presently existing. FP&L considers the preliminary control room design review effort in this area to be complete.

D.7 (3.7) Plant Process Computer

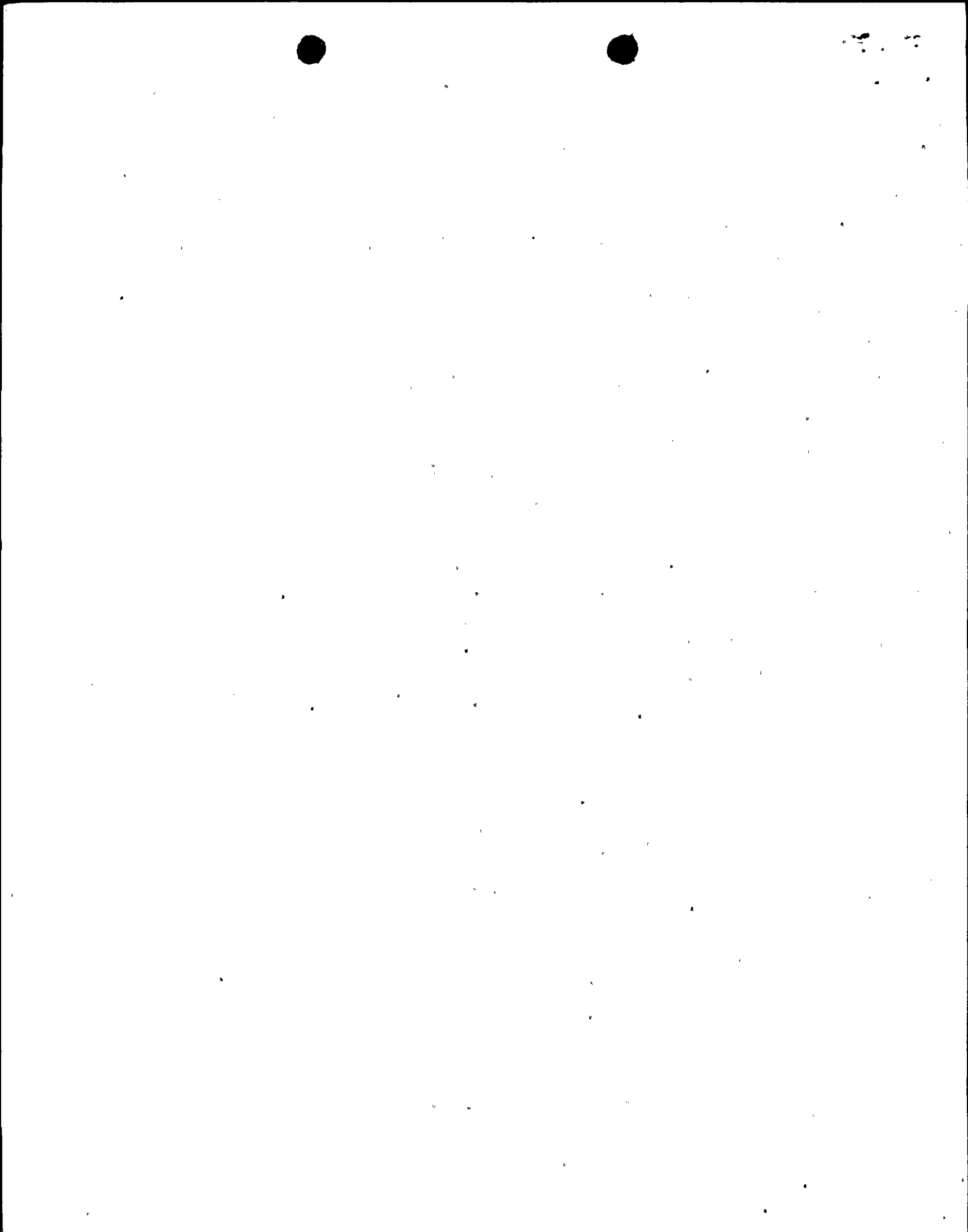
A survey and evaluation of the plant process computer was performed as noted in Section 3.7 of FP&L's NTOL Summary Human Engineering report dated October 28, 1982. Included in the survey were the Digital Data Processing System (DDPS), Sequence of Events Recorder (SER) and Analog Display System (ADS). It should be noted that the DDPS is the plant computer, the SER is an event recorder with no trend or operator interactive activities and the ADS system is a CRT display of control rod and control rod group status. The findings identified along with corrective actions and implementation schedule are as identified in Section 3.7 of the referenced report. There were no discrepancies noted with the ADS.

FP&L considers this portion of the preliminary Control Room design review effort to be complete.

D.8 (3.8) Protective Equipment Storage and Availability

A review of availability and storage of protective equipment was performed in conjunction with item 3.2 Control Room general layout as identified in FP&L's NTOL Summary Human Engineering Report dated October 28, 1982. As part of the Control Room layout design, storage and accessibility of protective clothing was reviewed by the Control Room engineering design integration team incorporating comments from FP&L's human factors consultant, operations and engineering disciplines to achieve the best utilization of space, minimize traffic and expedite the donning of protective equipment. The pre-packaging of protective equipment into sized packages (small, medium, large) containing clothing, mitts, boots, tape, etc., easy access to face masks and corrective lenses which are accommodated by the subject face masks and locating of the storage facilities in the Control Room were the major items recommended by this effort. Implementation of this program is expected to be complete by mid-December 1982. FP&L considers this portion of the preliminary Control Room design review effort to be complete.

\* Dependent on equipment delivery.



<u>ITEM</u>	<u>DISCP.</u>	<u>#</u>	<u>MODEL</u>	<u>MFR.</u>	<u>LOCATION</u>	<u>REMARKS</u>
1	Call Director	2	2630 DAM	Western Electric	Communications Console	1 Ft. Pierce Line 1 Stuart Line 3 PBX Extensions 1 NAWAS Line 1 FPL Dispatcher System 1 FPL Dispatcher Division
2	Page (Party Line)	8	7105-002	Gai-tronics Corp.	4 On RTGB(s) Front 2 On Comm. Console 2 Behind RTGB's	Installed and in use
3	Page (Party Line)	4	2) 7205-002 2) 7105-002	Gai-tronics	1 NPS Office 7205-002 1 NWE Office 1 HVAC 1 RACB II 7105-002	Not Installed
4	NRC Dedicated Line	1	500 DM	Western Electric	Communications Console	Red
5	Sound Powered Phones Jacks	4	Headsets P/N 12514G-01 Model #H5010	David Clark Co.	Communications Console	2 Jacks to Tech. Support Center Unit I 2 Jacks to Plant Loop - Unit II
6	T.S.C. Dedicated Line	1	564 HLM	Western Electric	Communications Console	5 Push Button Model #'s are Unit 1 Numbers
7	Emergency Ops Center	1	568 HAAM	Western Electric	Communications Console	Radiological Emerg. Comm. System Model #'s are Unit 1 Numbers
8	Fire Phone	1	500 DM	Western Electric	Communications Console	Red (PAX)
9	Plant Phone	1	500 DM	Western Electric	Communications Console	(PAX)
10	Call Director	1	Touch-A-Matic 2872A2M	Western Electric	NPS Office	33 Button Auto Dial 5 Trunk Lines 3 Ext. Same as Comm. Cons. (PBX) 1 Stuart Line 1 Ext. PBX Diff. Than Comm. Cons.
11	5 Push Button (PBX)	3	2564 HLM	Western Electric	1 NWE Office 2 Operators Desk	3 PBX Extensions 1 Ft. Pierce Line 1 Stuart Line

TABLE 3.4.1 (Sheet 1 of 2)

<u>ITEM</u>	<u>DISCP.</u>	<u>#</u>	<u>MODEL</u>	<u>MFR.</u>	<u>LOCATION</u>	<u>REMARKS</u>
12	Plant Phone (PAX)	2	HC 802000ASA	G.T.E. Automatic Electric	1 NWE Office 1 NPS Office	
13	LGR Radio	1	Centracom Series Comm. Control Center	Motorola	Communications Console	5 Channel Radio Control 1) 2 Channels LGR 2 Channels Plant Use 1 Channel FPL Div. Dispatcher
14	Priority Phone (Pager)	1	SC 500 DNW	Stromberg Carlson	Communications Console	Provides access to operator paggers.

