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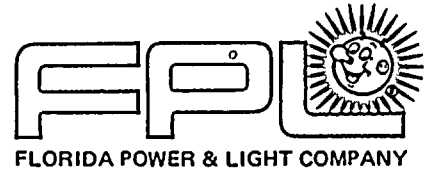
ACCESSION NBR: 8301200328 DOC. DATE: 83/01/14 NOTARIZED: NO DOCKET #
 FACIL: 50-389 St. Lucie Plant, Unit 2, Florida Power & Light Co. 05000389
 AUTH. NAME AUTHOR AFFILIATION
 UHRIG, R.E. Florida Power & Light Co.
 RECIP. NAME RECIPIENT AFFILIATION
 EISENHUT, D.G. Division of Licensing

SUBJECT: Forwards modified responses to Items A.1.3, A.3.1, A.4.10, A.5.8, A.5.9 & A.6.11 of App C, Suppl 1 to NUREG-0843 re control room design, per 821227 telcon. Updated Section 3.1 of "Near-Term OL Summary Human Engineering Rept..." also encl.

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	LIC BR #3 LA	1 0	NERSES, V. 01	1 1
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	IE/DEP EPDS 35	1 1	IE/DEP/EPLB 36	3 3
	NRR/DE/AEAB	1 0	NRR/DE/CEB 11	1 1
	NRR/DE/EQB 13	2 2	NRR/DE/GB 28	2 2
	NRR/DE/HGEB 30	1 1	NRR/DE/MEB 18	1 1
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	NRR/DE/SAB 24	1 1	NRR/DE/SEB 25	1 1
	NRR/DHFS/HFEB40	1 1	NRR/DHFS/LQB 32	1 1
	NRR/DHFS/OLB 34	1 1	NRR/DL/SSPB	1 0
	NRR/DSI/AEB 26	1 1	NRR/DSI/ASB	1 1
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	NRR/DSI/RSB 23	1 1	REG FILE 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



January 14, 1983
L-83-18

Office of Nuclear Reactor Regulations
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Mr. Darrell G. Eisenhut, Director
Division of Licensing

Dear Mr. Eisenhut:

Re: St. Lucie Unit No. 2
Docket No. 50-389
FPL/NRC December 27, 1982 Telecommunication
on Control Room Design Review
Supplement 1 of NUREG-0843

Attached are the agreed to modified responses to items A.1.3, A.3.1, A.4.10, A.5.8, A.5.9 and A.6.11 of Appendix C, Supplement No. 1 of NUREG-0843. In addition, attached is an updated response on item 3.1 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,

Robert E. Uhrig
Vice President
Advance Systems and Technology

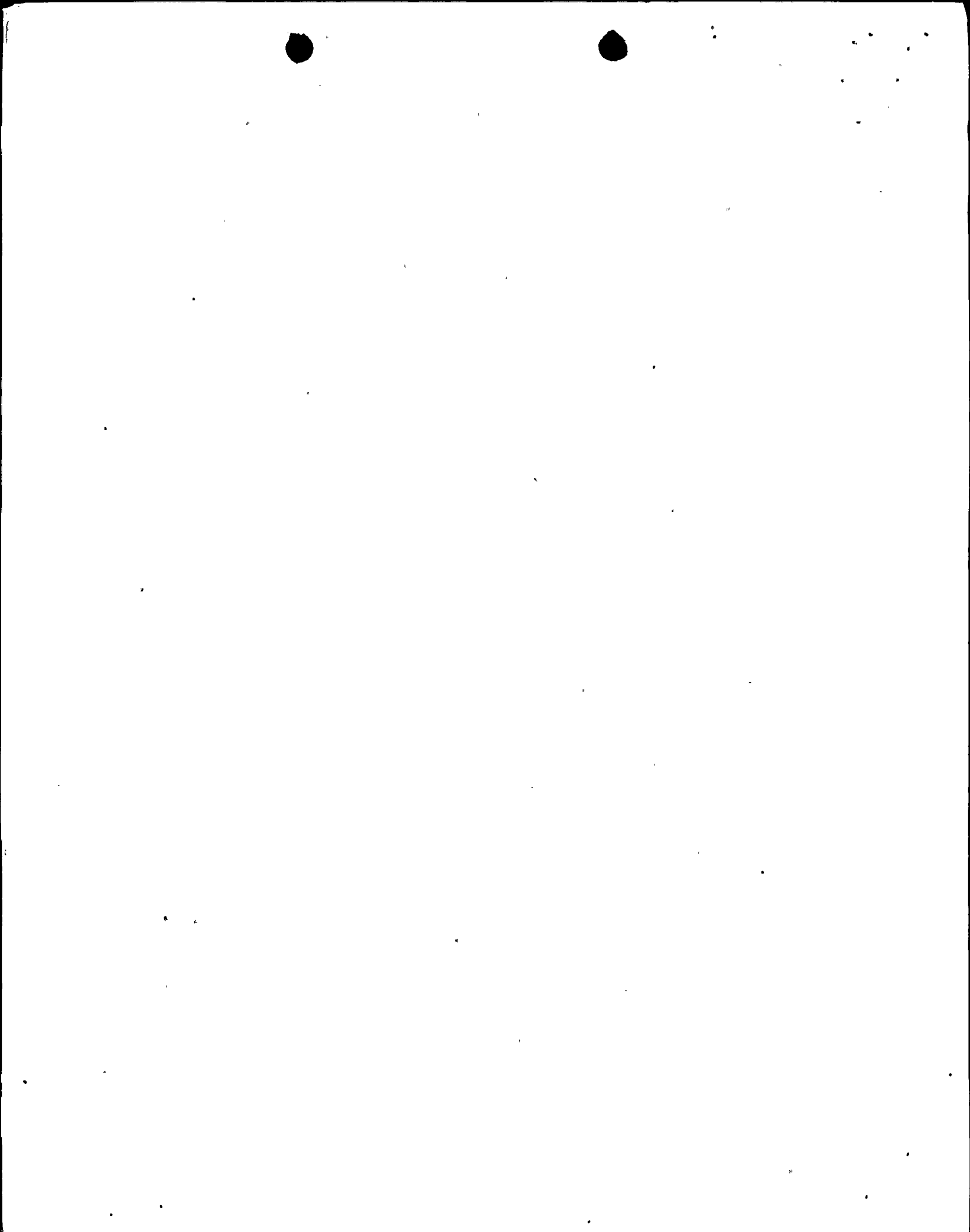
REU/RJS/MT/au

Attachments

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

Boo1

830120032B 830114
PDR ADCK 05000389
A PDR



Attachment

RECORD OF PHONE CONVERSATION
December 27, 1982

A conference call between Florida Power & Light Company project and human factor engineering team representatives and representatives of the Nuclear Regulatory Commission licensing branch and human factor's branch was held on December 27, 1982 at approximately 1300. 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 letters L-82-477, dated 10/29/82 and L-82-496, dated 11/10/82.

The following are submitted to provide modified responses to SER Supplement No. 1 Appendix C findings A.1.3, A.3.1, A.4.10, A.5.8, A.5.9 and A.6.11 as agreed to and provide additional information with regard to section 3.1 of Florida Power & Light's NTOL Summary Human Engineering Report on St. Lucie Unit No. 2 Control Room (Supplement #1) dated October 28, 1982.

SER Supplement No. 1 Appendix C Finding A.1.3

The original finding and response were as follows:

Finding

A.1.3 There are no provisions for key storage and no procedures for key access control for keys used in the Control Room and for keys used at the Remote Shutdown Panel. (1.6)

Response

Key storage will be provided as well as the necessary key access control procedures for those keys used in the Control Room and Remote Shutdown Panel prior to fuel load. The Remote Shutdown Panel SIS block keys will be maintained at RAB control access point.

After discussions with representatives from FP&L Operations Staff and Human Factors Branch of the Nuclear Regulatory Commission it was agreed that the response to Finding A.1.3 would be modified to read:

"Key storage will be provided as well as the necessary key access control procedures for those keys used in the Control Room and Remote Shutdown Panel prior to fuel load."

Deletion of the last sentence was deemed appropriate since FP&L is implementing the same Remote Shutdown Panel key control procedure and key locker access as presently exists on St. Lucie Unit No. 1. Implementation of this plan provides for storage of the SIS block keys in a locked key locker located in the Remote Shutdown Panel Room. Location of the SIS block keys in the Remote Shutdown Panel Room greatly improves operator access to the subject keys and minimizes the amount of time it would take the operator to man his station with the subject keys.

SER Supplement No. 1 Appendix C Finding A.3.1

The original finding and response were as follows:

Finding

A.3.1 The function of the annunciator tile labeled ANNUNCIATOR POWER SUPPLY on annunciator Panel K is not clear. (3.1)

Response

The tile will be re-engraved to read "Annunciator Backup Power Supply" prior to the issuance of an operating license.

After review of the subject annunciator Operations personnel at St. Lucie Unit No. 2 felt that labeling the subject annunciator as "Annunciator Power Supply Failure" was more descriptive than the original annunciator label presented in the response above.

The subject annunciator tile will be labeled "Annunciator Power Supply Failure".

SER Supplement No. 1 Appendix C Finding A.4.10

The original finding and response were as follows:

Finding

A.4.10 Rotary switches and keyswitches have unlabelled positions. (4.12)

Examples:

- a) SIAS Block Channel SA and SB keyswitches on Panel 206
- b) MSIS Block Channel SA and SB keyswitches on Panel 206
- c) Trip Circuit Reset rotary switches on the RPS Panel

Response

These positions will be labeled prior to issuance of an operating license.

After performing an engineering review and field inspection of plant documents, standards and switch escutcheon plates it was verified that the normal position on control switches is not engraved. The existing condition is as per the Architect Engineer's labeling specification and control switch position convention. As a result of conversations with representatives from the NRC's Human Factors Branch and FP&L's Project Management Team and Human Engineering Group it was agreed to modify the subject response to read:

"These positions will be labeled to be consistent with plant standards and existing control switch conventions prior to issuance of an operating license."

SER Supplement No. 1 Appendix C Finding A.5.8

The original finding and response were as follows:

Finding

A.5.8 Several meter scales have thick black marks to extend major thick marks to the scale numerals. These marks give the misleading appearance of minus (-) signs in front of the meter scale numerals. (5.11)

Examples: (HVAC Panel)

- a) PDIS-25-1B
- b) PDI-25-15B

Response

The marks viewed as being interpreted as minus (-) signs will be removed. This will be accomplished prior to fuel loading.

During a field review of this item with NRC Field Inspector, Mr. Steve Elrod, it was agreed that the major thick marks on sigma meters did not pose any confusion to the control room operator. Where indicators display positive and negative values the scales are conspicuously marked indicating positive and negative values. Major graduation on sigmas are consistently marked as per the attached Figures 1 & 2. Figure 1 depicts a typical sigma scale showing a negative to positive value scale and Figure 2 depicts a typical sigma scale showing zero to positive values.

As agreed to previously during conversations between representative of the NRC's Human Factors Branch and FP&L's Human Engineering Group FP&L has modified its response to read:

"The marks viewed as being minus (-) signs by the field inspection team pose no significant interpretation problem to the control room operator. The subject sigma meter graduations are consistently presented. Where negative and positive values are displayed by indicators minus (-) and plus (+) signs are conspicuously placed on indicator scales. FP&L intends no further action on this item."

SER Supplement No. 1 Appendix C Finding A.5.9

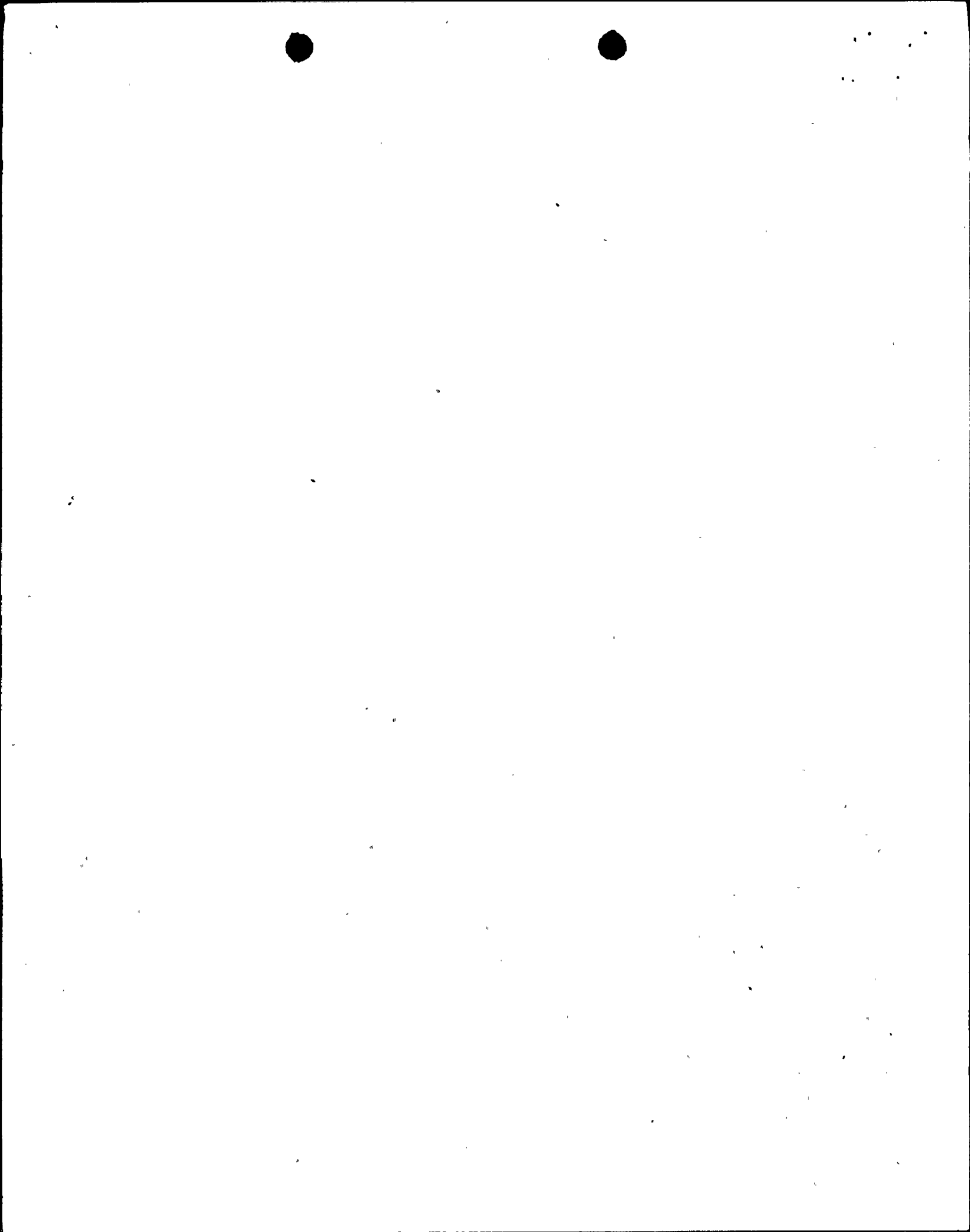
The original finding and response were as follows:

Finding

A.5.9 There are several displays which use unconventional scale graduations. (5.12)

Examples:

- a) Panel 201: DIESEL GENERATOR 2B MVARs VARM-1616
- b) Panel 204: WIDE RANGE % POWER JI-001B
- c) Panel 203: LOOP 2A COLD LEG TEMP TIC-III
- d) Diesel Gen 2B Frequency



Response

The displays listed in the finding will be modified as follows:

Meter faces will be color coded to reflect normal operating ranges prior to issuance of an operating license. Displays will be reviewed for scale convention during the long-term control room review and reported on in accordance with NUREG-0700.

After discussions with the NRC Field Inspector, Mr. Steve Elrod, on the above finding FP&L feels that the above response should be modified to reflect the intent of the color coding program presently being implemented to denote normal operating ranges on indicators. The modified response reads as follows:

"The displays listed in the finding will be modified as follows:

Meter faces will be color coded to reflect normal operating ranges. Those indicators which are used over a wide range of operating conditions and have no definite operating bands will not be color coded since no improvement in operator performance would be expected and possible confusion as to the meaning of the color code may contribute to operator error during operation. Items b and c in the above finding will not have any color operating bands placed on their scale since they are used under a variety of operating conditions and their normal operating band depends on plant status."

SER Supplement No. 1 Appendix C Finding A.6.11

The original finding and response were as follows:

Finding

A.6.11 The CONDENSER VACUUM DISPLAY (PI-10-7B) on Panel 201 has a mislabeled scale. It should read "Inches Hg Vacuum" instead of "Inches Hg ABS". (6.13)

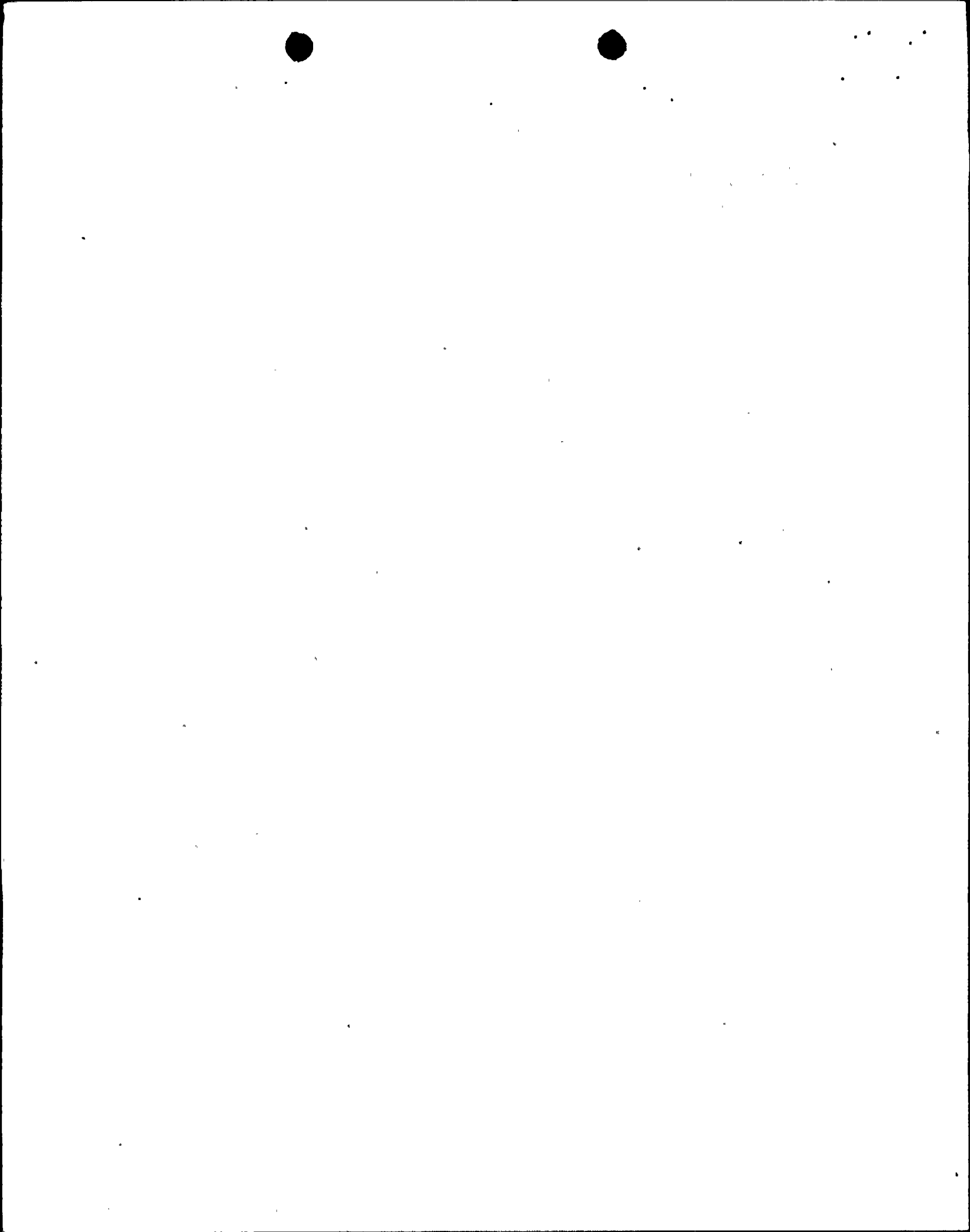
Response

The condenser vacuum display will be labeled as "Inches Hg" prior to fuel loading.

A review of St. Lucie Unit No. 2 piping and instrumentation drawings indicates that PI-10-7B displays condenser pressure as "Inches Hg ABS".

After discussions with the NRC Field Inspector, Mr. Steve Elrod, on the above finding it was agreed that the above response would be modified to read:

"The condenser vacuum display (PI-10-7B) displays condenser pressure as "Inches Hg ABS", and is consistent with plant documentation. The subject display will be labeled, "Inches Hg ABS"."



NTOL SUMMARY HUMAN ENGINEERING REPORT ON ST. LUCIE UNIT NO. 2
 CONTROL ROOM (Supplement #1) Update of Section 3.1

I. (3.1) Control Room Environment

A. Lighting

A light survey of the control room was conducted during the month of August, 1982 with the results as previously presented in the NTOL Summary Human Engineering Report dated October 28, 1982. The emergency light levels were found acceptable and the normal AC light levels were to be reduced to approximately 50 ft. candle levels by switching off selected banks of A.C. lights not on the vital AC auto diesel load circuits.

A light survey was conducted January 7, 1983 after normal light levels were reduced. The normal AC light levels were reduced to acceptable levels such that emergency light levels remain unaffected. The normal AC light levels as tested are presented in Figure 3 and table 3.1. It should be noted that where control panels have vertical and horizontal work areas light levels were measured on both planes.

In conclusion, FP&L considers the control room light survey to be satisfactorily complete and intends no further action as part of the Preliminary Control Room Design Review effort.

CONTROL ROOM NORMAL AC LIGHT LEVELS
 TABLE 3.1

Position	Level in Ft. Candelas	Position	Level in Ft. Candelas
1	90	16	38
2	49	17	35
3	73	18	32
4	77	19	37
5	55	20	35
6	56	21	37
7	55	22	47
8	52	23	79
9	45	24	75
10	46	25	62
11	41	26	70
12	36	27	110
13	41	28	22
14	35	29	29
15	39		

B. Temperature and Humidity

An assessment of the St. Lucie Unit No. 2 control room ventilation system was conducted from January 7 through January 10, 1983. No discrepancies were noted. The Control Room measured temperature and relative humidity ranged

from 72 to 75° F. and 50 to 54% respectively while the ambient dry bulb temperature and dew point ranged from 59 to 75.5° F. and 52 to 68° F. respectively. FP&L considers the temperature humidity survey of the control room to be satisfactorily complete and intends no further action as part of the Preliminary Control Room Design Review effort.

C. Noise

A noise survey of the St. Lucie Unit No. 2 control room was conducted on December 30, 1982. Figure 5 shows the control room locations where sound measurements were taken. Table 5.1 lists the background levels and Table 5.2 lists the panel annunciator levels as measured, at position 1 of Figure 5.

It was determined that the 8 Reactor Protection System cooling fans were the major contributing factor to the observed background noise levels. A second survey was conducted with only 4 of the subject fans running. By reducing the number of cooling fans by half, an approximate 3dbA reduction in background noise level was achieved.

Presently FP&L is reviewing the redesign of the air supply to the reactor protection system and will implement the necessary system design changes to reduce the noise contributed by the subject cooling fans during the first refueling outage.

FP&L will install carpeting in the control room which is expected to help reduce background noise levels. The carpeting will be installed after construction activity in the control room is complete.

FP&L considers the control room sound survey to be complete. The presently installed annunciator sound devices are adjustable and will be raised to 10 dbA above background.

CONTROL ROOM BACKGROUND SOUND LEVEL SURVEY

TABLE 5.1

Location	Sound Levels in dbA	
	8 RPS Fans Running	4 RPS Fans Running
1	68	66
2	69	65
3	71	68
4	66	63
5	63	61
6	62	62
7	62	61
8	60	59
9	59	59
10	61	61

CONTROL ROOM ANNUNCIATOR SOUND LEVEL SURVEY

TABLE 5.2

Alarm Location	Reading dbA
A	81
B	80
C	79
D	Not Operational
E	77/77
F	Not Operational
G	77
H	Not Operational

NOTE: Readings were taken at location 1

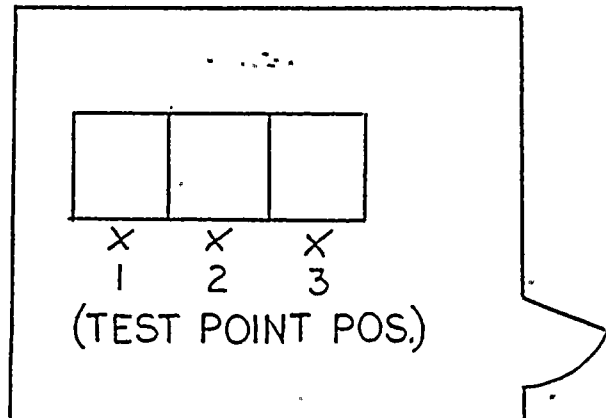
FP&L considers this effort of the Preliminary Control Room Design Review effort to be complete.

II. (3.1) Remote Shutdown Panel Environment

A. Lighting

A light survey of the normal AC and emergency D.C. light levels in the Remote 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:

Remote 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 REMOTE 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 Remote Shutdown Panel room will be reduced for conditions 2 and 4 above by reducing the incandescent lamp size. Verification testing will be complete after installation of the two control relays which are scheduled for installation during the second week of February, 1983.

B. Temperature and Humidity

A review of the St. Lucie Site Environmental data presented in section 2.6 of the St. Lucie Unit No. 2 Environmental Report was performed. The data presented indicates that the upper extreme climatic conditions for the site can reasonably be expected for approximately 8.5% of the year (31 days - high temperature with high humidity). The Remote Shutdown panel room is supplied with ambient air at approximately 1000 SCFM by the Reactor Auxiliary Building Supply Fan. During the above mentioned extreme conditions the ambient air may be between 90 and 101° F with a maximum wet-bulb temperature of 76.5° F. It is estimated that the air flow rate mentioned above would provide the operator with a working habitate having an air movement of 30 Ft/Min with a supply air temperature rise of approximately 3° F. Based on a maximum wet-bulb temperature of 76.5° F., a maximum dry bulb temperature of 104° F. and an air velocity of 30 Ft/Min it is anticipated that the Remote Shutdown Panel Room environment will be within the 85° F. or less effective temperature range at least 96% of the year. The 85° F. effective temperature limit referenced is as defined by MIL STD-1472 and extracted from the curves of figure 38, MIL STD-1472 .

Since the remote shutdown panel room environment is conservatively estimated to be marginally outside the 85° F. effective temperature range 16 days (4%) of the year FP&L intends no further action on this item as Part of the Preliminary Control Room Design Review effort. This item will be readdressed during the Detailed Control Room Design Review at which time the subject fan system balancing and fan performance testing would have been complete and a more accurate assessment of existing operational conditions

can be made. FP&L considers the results obtained and the Preliminary Control Room Design Review effort to be satisfactorily complete.

C. Noise

A noise survey of the St. Lucie Unit No. 2 Remote Shutdown Panel Room was conducted on December 30, 1982. The maximum sound level observed was 59 dbA which was well within the 65 dbA level presented in NUREG-0700. The observed background sound levels are acceptable and FP&L considers this portion of the Preliminary Control Room Design Review effort to be satisfactorily complete.

MT/au

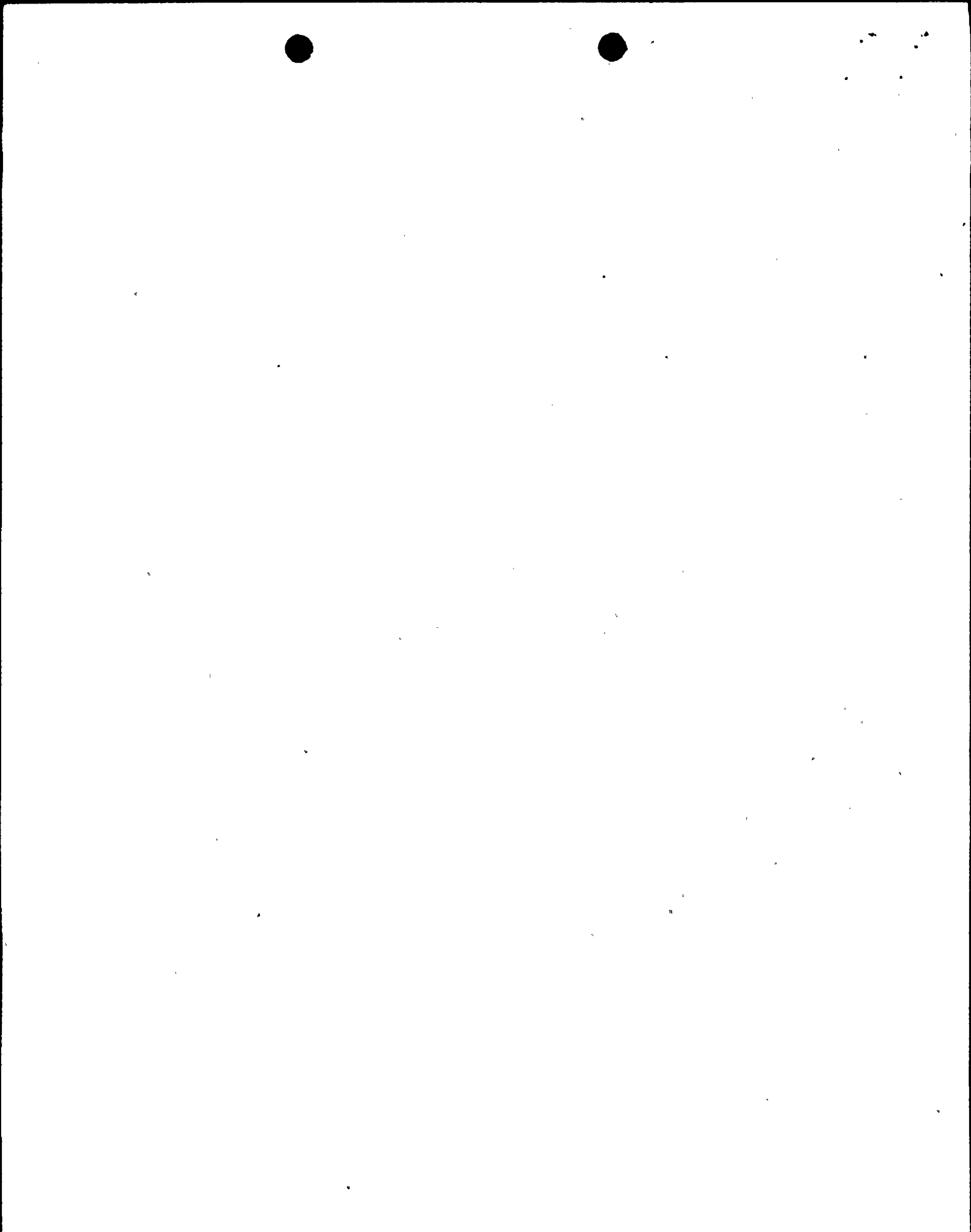


FIGURE NO. 1

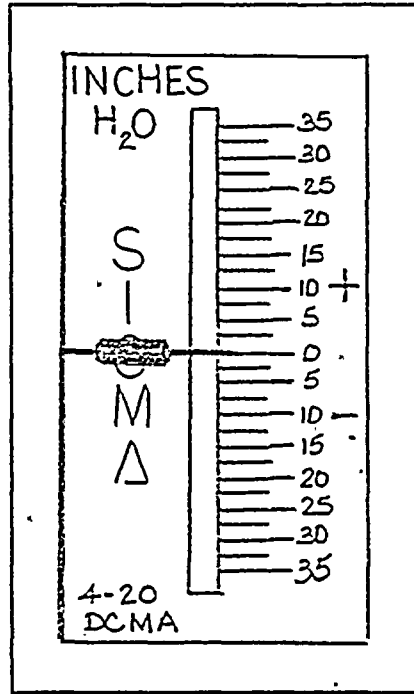
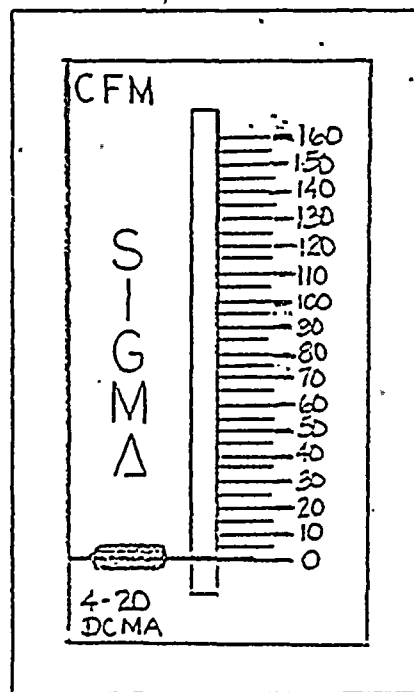
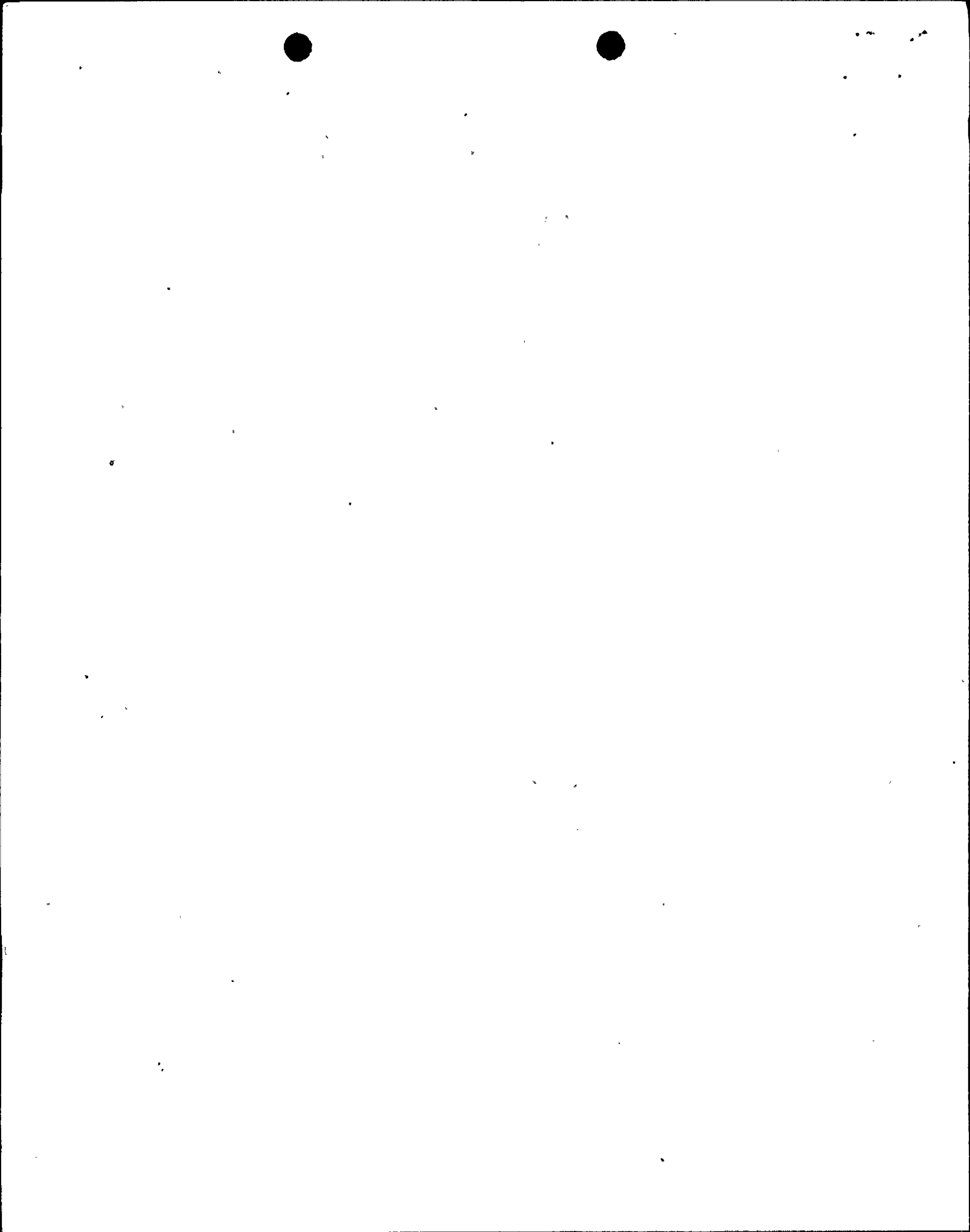


FIGURE NO. 2



*NOTE
SKETCHES REP.
FOR GRAPHIC
PURPOSES



NORMAL AC LIGHTING LEVELS
(FOOT-CANDLES)

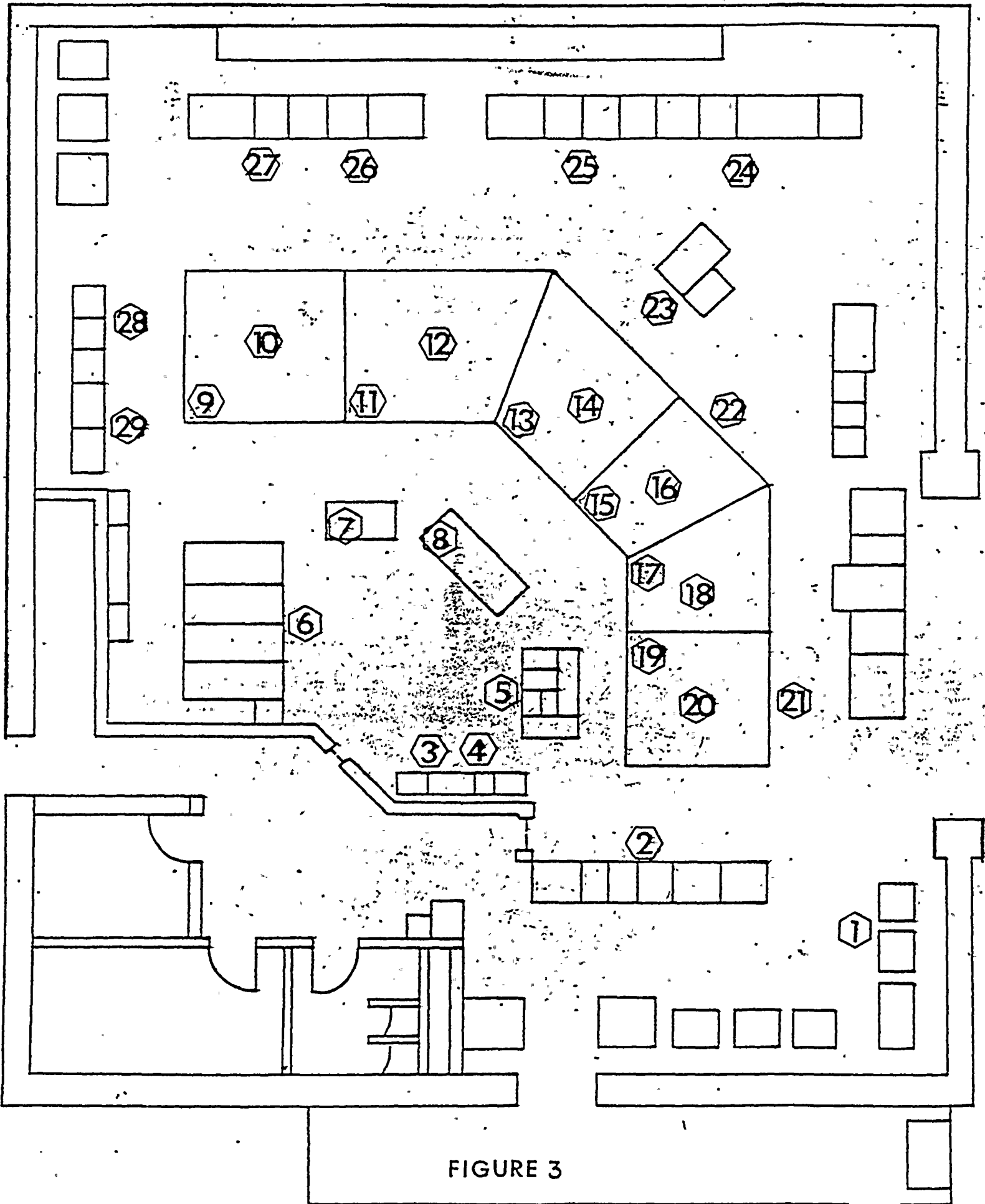


FIGURE 3

CONTROL ROOM ENVIRONMENTAL DATA

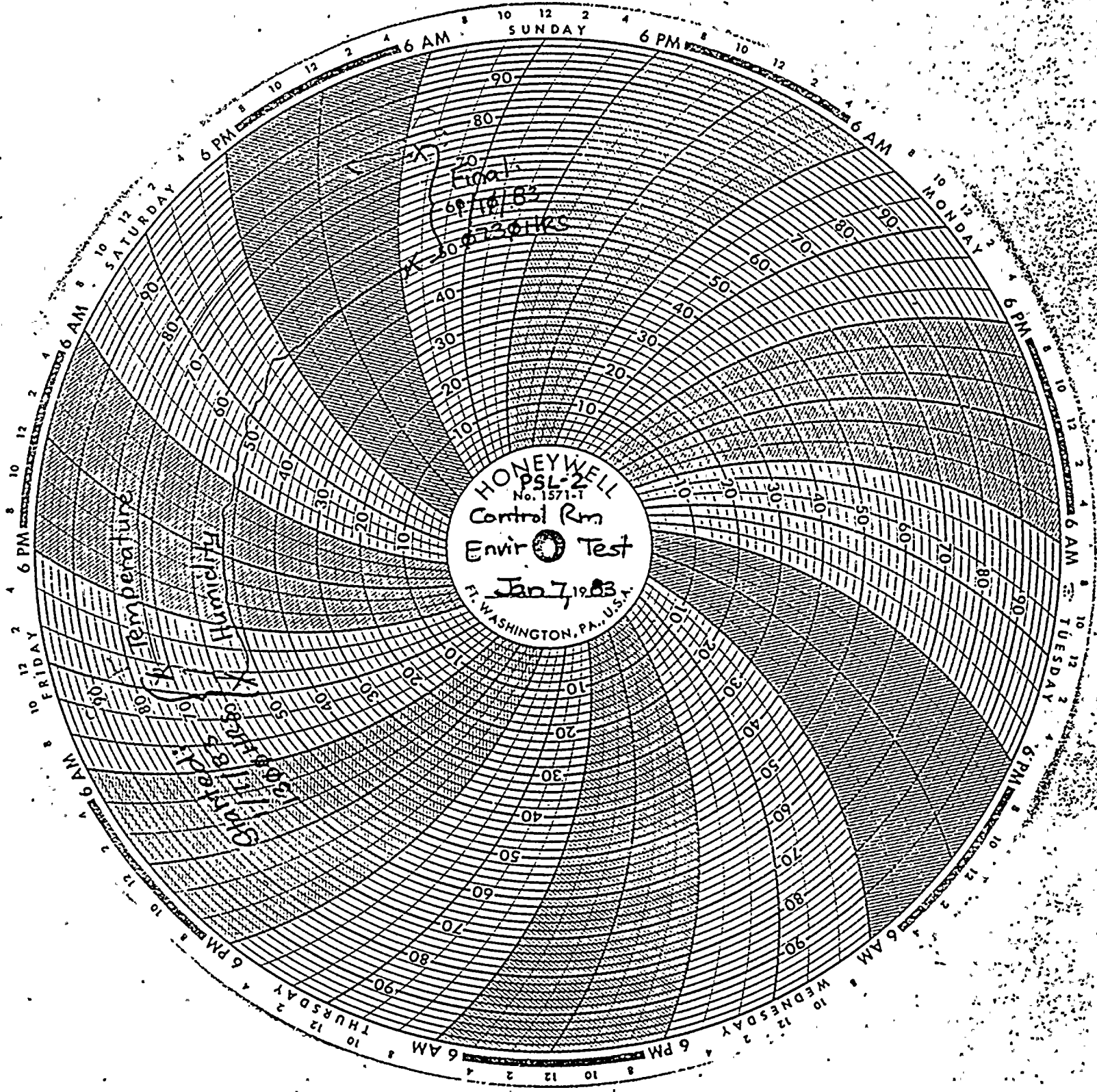


FIGURE 4

SOUND LEVEL SURVEY - DSL NO. 2 READING LOCATIONS

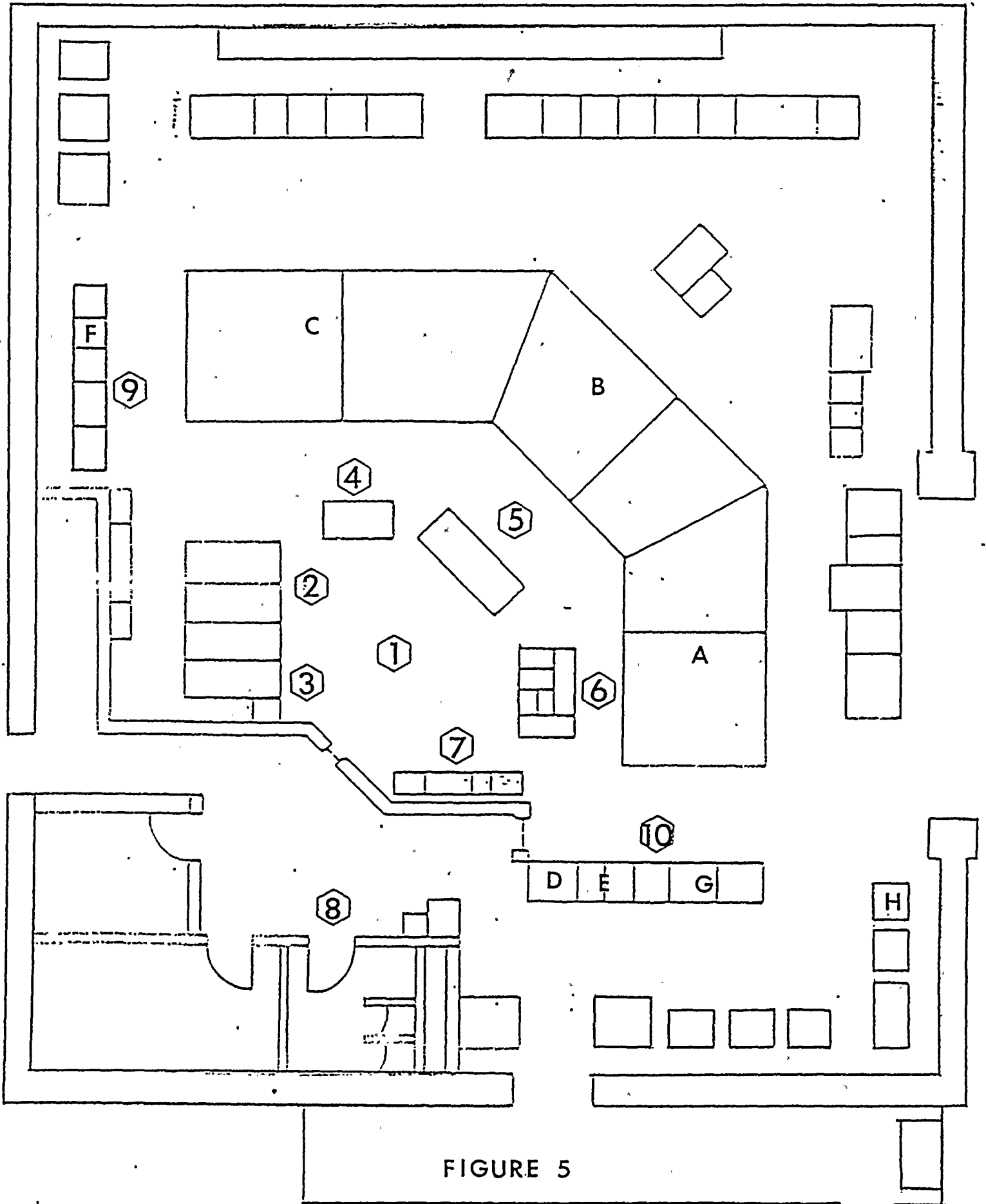


FIGURE 5

