REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

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AUTH. NAME AUTHOR AFFILIATION
CURTIS, N. W. Pennsylvania Power & Light Co.
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INTERNAL:	ELD/HDS4		1	0	IE FILE		1	1
	IE/DEP EPDS	35	1	1	IE/DEP/EPLB	36	3	3
	MPA		1	0	NRR/DE/CEB	11	1	1
	NRR/DE/EQB	13	3	3	NRR/DE/GB	28	2	2
	NRR/DE/HGEB	30	2	2	NRR/DE/MEB	18	1	1
	NRR/DE/MTEB	17	1	1	NRR/DE/QAB	21	1	1
	NRR/DE/SAB	24	1	1	NRR/DE/SEB	25	1	1
	NRR/DHFS/HFEB	40	1	1	NRR/DHFS/LQB	32	1	1
	NRR/DHFS/OLB	34	1	1	NRR/DHFS/PTRB	20	1	1
	NRR/DSI/AEB	26	1	1	NRR/DSI/ASB	27	1	1
	NRR/DSI/CPB	10	1	1	NRR/DSI/CSB	09	1	1
	NRR/DSI/ETSB	12	1	1	NRR/DSI/ICSB	16	1	1
	NRR/DSI/PSB	19	1	1	NRR/DSI/RAB	22	1	1
	NRR/DSI/RSB	23	1	1	NRR/DST/LGB	33	1	1
	REG FILE	04	1	1	RGN1		2	2
EXTERNAL:	ACRS	41	10	10	BNL(AMDTS ONLY)		1	1
	DMB/DSS (AMDTS)		1	1	FEMA-REP DIV	39	1	1
	LPDR	03	2	2	NRC PDR	02	1	1
	NSIC	05	1	1	NTIS		1	1

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	LIC BR #2 LA	1	0	PERCH,R. 01	1	1
INTERNAL:	ELD/HDS4	1	0	IE FILE	1	1
	IE/DEP EPDS 35	1	1	IE/DEP/EPLB 36	3	3
	MPA	1	0	NRR/DE/CEB 11	1	1
	NRR/DE/EQB 13	3	3	NRR/DE/GB 28	2	2
	NRR/DE/HGEB 30	2	2	NRR/DE/MEB 18	1	1
	NRR/DE/MTEB 17	1	1	NRR/DE/QAB 21	1	1
	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/DHFS/PTRB20	1	1
	NRR/DSI/AEB 26	1	1	NRR/DSI/ASB 27	1	1
	NRR/DSI/CPB 10	1	1	NRR/DSI/CSB 09	1	1
	NRR/DSI/ETSB 12	1	1	NRR/DSI/ICSB 16	1	1
	NRR/DSI/PSB 19	1	1	NRR/DSI/RAB 22	1	1
	NRR/DSI/RSB 23	1	1	NRR/DST/LGB 33	1	1
	REG FILE 04	1	1	RGN1	2	2
EXTERNAL:	ACRS 41	10	10	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

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PP&L Pennsylvania Power & Light Company
Two North Ninth Street • Allentown, PA 18101 • 215 / 770-5151

Norman W. Curtis
Vice President-Engineering & Construction-Nuclear
215 / 770-5381

July 2, 1982

Mr. A. Schwencer, Chief
Licensing Branch No. 2
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUSQUEHANNA STEAM ELECTRIC STATION
RESPONSE TO NRC REQUEST FOR HUMAN FACTORS INFORMATION Docket Nos. 50-387
ER100450 FILE 841-2 PLA-1163 50-388

Dear Mr. Schwencer:

The attached information was requested by the Human Factors Branch during a telephone conversation on July 1, 1982.

Very truly yours,

David P. Moyer for

N. W. Curtis
Vice President-Engineering & Construction-Nuclear

DPM/dpm

Attachment

cc: R. L. Perch

B001

Direct Acting Bailey Controllers

PP&L identified all Bailey controllers on the inner ring panels that were not direct acting (i.e. 100% meter indication corresponds to 100% open). All applicable controllers were corrected consistent with our commitment. Additional Bailey controllers on a standy gas treatment panel and HVAC panel were questioned by the NRC inspector. While these controllers were beyond the scope of our original review, they were looked at as part of our NUREG 700 activities. Although no thorough analysis of the usage of these controls, the severity of this deficiency or extraneous operational constraints were considered, we agree to change out these meters per NRC demand. Delivery time of these custom made controllers (ordered as spares months ago) will be August 1, 1982. Allowing for reasonable time for receipt and installation (this constitutes a design change and will require more administrative control than a replacement of equivalent equipment), we should have the meters in place by September 1, 1982.

AUTO White Lights

In reviewing the control boards, many push button control stations have a white light to indicate AUTO function. The concern was raised that some control stations did not have AUTO lights. The panels were reviewed and two turbine pump control stations were modified to include white lights. Our convention is to use the AUTO white lights to indicate that the controller is in the AUTO function when the light is lit. Loss of the white light indicates manual override of the controller. Some control stations have the word AUTO in their label. However, these controls are always in AUTO. If a signal comes in to actuate the AUTO function, the signal will actuate the device regardless of switch position. In this case, the AUTO light would be viewed as redundant.

Unconventional Labeling

(a) Several scale labels were in increments of (.3). These will be replaced with new permanent scales with (.2) subdivisions. These labels can be in place by Sept. 1, 1982.)

(b) Bailey Scale Displays

The Bailey controllers also include a display built into the face of the equipment. In most applications an independent indicator alongside the controller provides the controlled variable. Bailey controllers are labeled above, the corresponding indication is labeled below, which is our design convention. These devices are first and foremost as a controller and are labeled as such. There is an area where a redundant display label could be added. However, the controller and meter bezel protrude out from the face of the device. If labels below were added for the indicators, they would be partially obscured by the bezel. Additionally, shadows from overhead lighting were possible (from certain viewing angles).

Based on the availability of display data properly labeled elsewhere, and the important fact that the device is a controller; the severity of a perceived deficiency in no display label is quite low. (Look at J802 sht. 4 for a good example of controller, display relationship.) The NRC received as part of our preliminary review submittal photographs of all the inner ring panels. Please consult them for a photograph of a Bailey controller.

Use of Decimals

J-800 drawings sheets 3 and 4 show horizontal meters that have decimals for subdivision. As can be seen from viewing this panel, our convention for switchyard type information is kilovolts, kiloamperes, megawatts and hertz. The meters involved are consistent with this nomenclature. However, since they represent small diesels, the values read will be low for amperage compared to large transmission lines. Hence, 0.4 kiloampers is a logical, normally expected value. (Note J-800 drawings were included in our preliminary review submittal.)

PP&L

Measurement of containment pressure is accomplished over three ranges. See Table 1 for control room indication. PI-15702 is a single channel indicator for display of pressure within the normal operating range. Seperate reactor protection system pressure switches actuate within this range and the narrow range indicator serves to indicate approach to a reactor protection setpoint. PR-15710A is a two pen recorder with each pen driven from a different instrument loop. The 0 to 65 psia range covers pressures that may arise from a design basis accident. The 0 to 250 psig range covers pressures spanning RG 1.97 requirements relating to capturing possible peak pressure transients. Instrument PR-15710B is a redundant system to PR-15710A.

Additionally, computer recording of drywell pressure is accomplished as shown in Table II.

PP&L believes that the selection of instrument ranges discussed herein addresses the NRC concerns of readability and required range.

TABLE I.

ACR INSTR.	DESCRIPTION	RANGE
PI-15702	Suppression Pool or Drywell Pressure	-1 to 3 psig
PR-15710A	Primary Containment Drywell Pressure Recorder (2 pen)	0 to 65 psia 0 to 250 psig
PR-15710B	Primary Containment Drywell Pressure Recorder (2 pen)	0 to 65 psia 0 to 250 psig

TABLE II.

COMPUTER POINTS		
MAP 03	Primary Containment Drywell Pressure	0 to 65 psia
MAP 04	Primary Containment Drywell Pressure	0 to 65 psia
MAP 05	Primary Containment Drywell Pressure	0 to 250 psig
MAP 06	Primary Containment Drywell Pressure	0 to 250 psig

Sound Level Survey

Attached you will find the data sheets for the sound level survey performed by General Physics on June 2, 1982. The positions indicated on the data sheet correspond to the same positions used by GP in the preliminary sound level measurements taken for our preliminary report. (Attached). Only five out of the 80 measurements taken on 6/2/82 were above the recommended 65 dBA maximum. Those higher (66 dBA and 67 dBA) were attributable to construction noise occurring at the time of measurement, not to permanent acoustical problems.

The data sheets do not show GP's tests of the annunciator system. From discussions with GP, the main annunciators were said to measure 73 dBA which is 8 dBA above the projected 65 dBA maximum. A completed report of sound level measurements will be made available to you once it is completed by General Physics. The annunciators were demonstrated to the Resident Inspector and no deficiencies were noted.

Preliminary Report

10/80

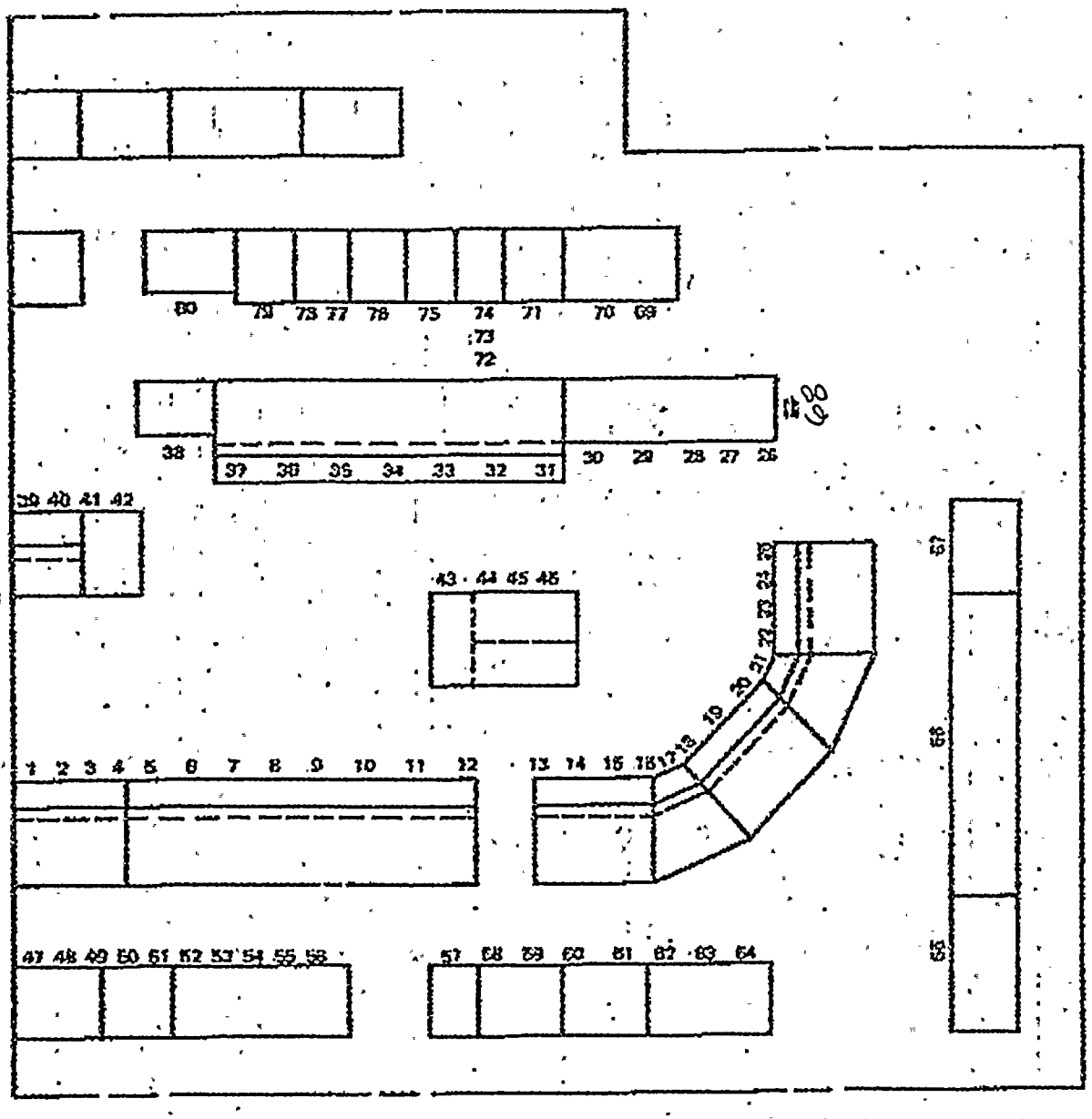


Figure 7

Susquehanna Unit I Control Room Layout Showing Location Codes for Sound and Lighting Measurements

Preliminary Report
10/80

TABLE 1. SOUND LEVEL MEASUREMENTS

Location	Overall Hertz Lin	A
1	75	67
2	78	62
3	78	65
4	78	63
5	75	65
6	75	63
7	75	63
8	80	65
9	75	70
10	78	62
11	78	68
12	75	65
13	76	66
14	80	68
15	77	70
16	76	62
17	78	65
19	75	65
20	75	63
21	78	62
22	80	63
23	74	65
24	75	65
25	75	65
26	78	67
27	79	68
29	76	65
30	76	65
31	75	68
32	75	68
33	73	66
34	75	70
35	77	64
36	78	65
37	77	69
38	75	63
39	78	63
40	78	62

Location	Overall Hertz Lin	A
41	77	65
42	77	65
43	73	63
44	75	65
45	80	70
46	80	70
47	72	58
48	73	59
49	76	60
50	74	64
51	73	58
52	74	62
53	72	61
54	76	62
55	76	58
56	78	62
57	76	62
58	75	63
59	75	62
60	76	64
61	78	65
62	76	67
63	75	64
64	78	64
65	76	63
66	78	62
67	72	64
68	70	65
69	76	64
70	75	65
71	76	64
72	76	63
73	72	63
74	74	64
75	72	62
76	78	64
77	76	68
78	75	61
79	72	62
80	75	65

NOTES: Sound level measurements were taken with a Bruel and Kjaer Model 2209 Sound Level Meter. Location codes are illustrated in Figure 7 .

NOISE SURVEY DATA SHEET [redacted] PLANT PP&L S[redacted]EHANNA

DATE OCTOBER 9, 1980

LOCATION:	Unit Operating Benchboard 1		Unit Monitoring Console 2		Plant Monitoring Console 3			
HERTZ	Lin	A	Lin	A	Lin	A	Lin	A
Overall	73	63	77	65	77	63		
20	58	<25	55	<25	55	<25		
25	50	<25	55	<25	55	"		
31.5	55	<25	53	<25	55	"		
40	58	25	57	26	60	26		
50	65	28	58	29	65	35		
63	58	35	60	33	70	43		
80	58	35	58	35	60	38		
100	58	38	63	38	58	41		
125	60	40	58	41	64	47		
160	55	40	57	42	68	42		
200	58	45	57	44	55	45		
250	58	53	53	48	57	49		
315	58	53	57	58	57	51		
400	58	55	68	59	65	51		
500	55	58	82	55	68	58		
630	52	58	65	53	60	61		
800	52	54	53	53	60	55		
1000	50	51	55	50	58	55		
1250	49	53	55	50	60	55		
1600	52	55	50	50	50	50		
2000	48	50	50	46	48	55		
2500	48	52	45	50	48	47		
3150	43	48	43	45	48	47		
4000	40	44	45	40	45	45		
5000	37	43	40	37	40	45		
6300	38	40	38	35	38	38		
8000	35	33	35	31	35	35		
10000	33	35	35	28	38	30		
12500	48	30	30	27	32	28		
16000	30	42	46	38	45	38		
20000	26	26	30	26	29	< 25		
25000	29	< 25	46	< 25	< 25	< 25		

6-10-82

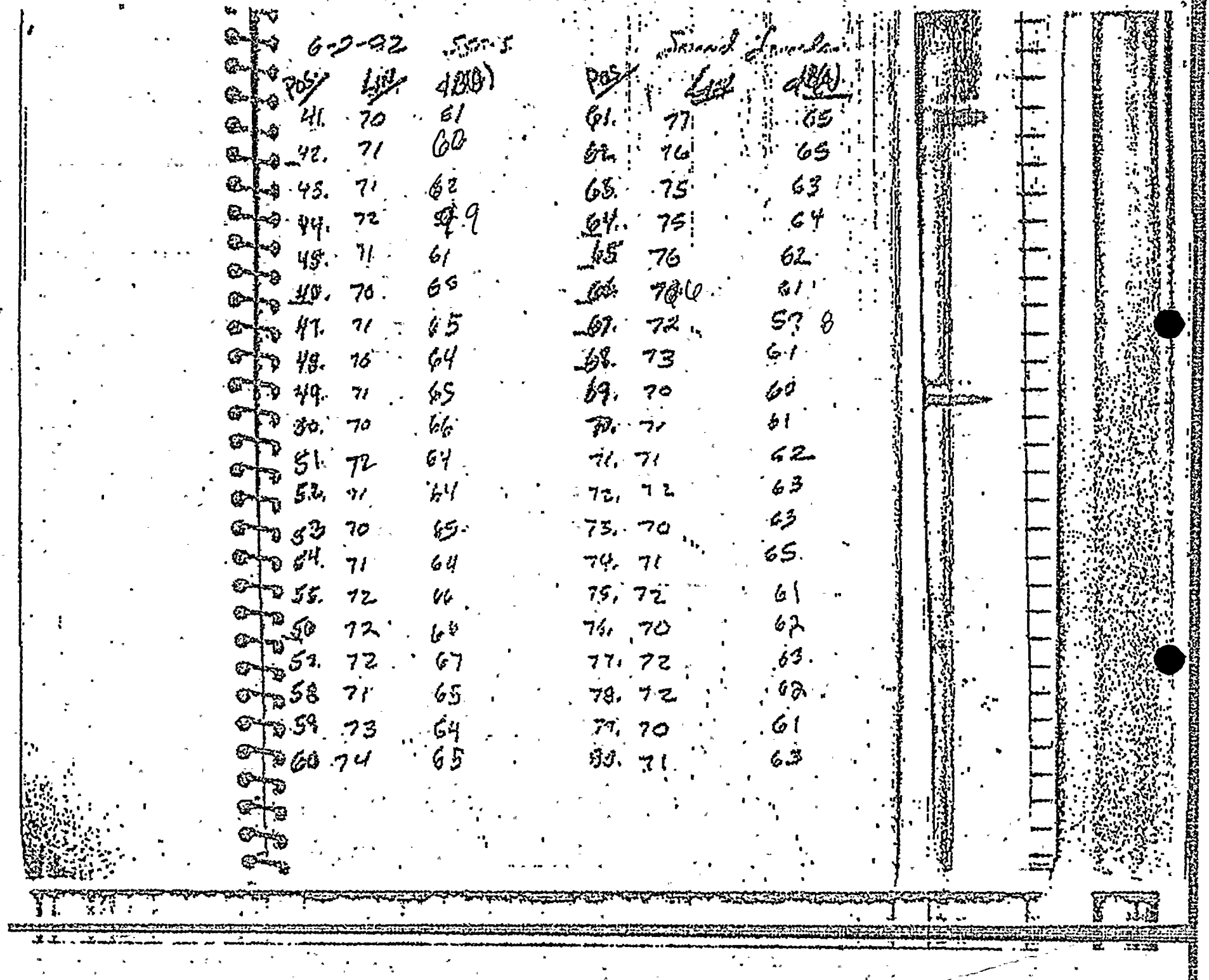
Gary,
Reference Pages 26, 27 Of The Initial Report. Item 8 B Of PP&L Letter PLA-648
J [signature]

Position 6-2-82 Linear scale ✓ 55ES dB(A)

Position	Lin.	A	Pos.	Lin.	dB(A)
1.	70	59	21.	71	59
2.	71	59	22.	69	58 58
3.	72	59	23.	69	59 59
4.	72	58	24.	70	59 59
5.	71	61	25.	69	55 55
6.	72	62	26.	72	59
7.	72	64	27.	72	62
8.	71	59	28.	70	64
9.	72	62	29.	71	59
10.	72	61	30.	70	61 61
11.	72	64	31.	70	64
12.	71	65	32.	70	613
13.	71	64	33.	71	646
14.	70	61	34.	72	65
15.	72	64	35.	71	61
16.	70	63	36.	71	64
17.	71	63	37	74	635
18.	70	59	38.	71	65
19.	69	61	39	73	62
20.	69	59	40.	70	60

653 (pos. 1); 601 (pos. 5); 651 (pos. 13); 518 (pos. 26); 668 (pos. 31); Printer (37); Printer (38); Control Console (39–40)

8



6-2-92 Strand 5

Pos	Len	4130
41.	70	61
42.	71	60
43.	71	62
44.	72	59
45.	71	61
46.	70	65
47.	71	65
48.	70	64
49.	71	65
50.	70	66
51.	72	64
52.	71	64
53	70	65
54.	71	64
55.	72	66
56	72	65
57.	72	67
58	71	65
59	73	64
60	74	65

Strand 6

Pos	Len	4130
61.	77	65
62.	76	65
63.	75	63
64.	75	64
65	76	62
66	76	61
67.	72	58
68.	73	61
69.	70	60
70.	71	61
71.	71	62
72.	72	63
73.	70	63
74.	71	65
75.	72	61
76.	70	62
77.	72	63
78.	72	62
79.	70	61
80.	71	63

6/2/82 SSE Sound Level Survey

This is recopied from a Telecopy of Pages 8 & 9

Page 1 of 3

Plane	Position	Linear Scale	dB(A)
	1	70	59
	2	71	59
	3	72	59
	4	72	58
601	5	71	61
	6	72	62
	7	73	64
	8	71	59
	9	72	62
	10	72	61
	11	72	64
	12	71	65
651	13	71	64
	14	70	61
	15	72	64
	16	70	62
	17	71	63
	18	70	59
	19	69	61
	20	69	59
	21	71	59
	22	69	58
	23	69	59
	24	70	59
SIP	25	69	55
	26	72	59
	27	72	62
	28	70	64
	29	71	59
668	30	70	61
	31	70	64
	32	70	62
	33	71	66
	34	72	65
	35	71	61
	36	71	64
	37	74	65

Reference Pages 26 & 27 of the Initial Report. Item 8B of PP&L letter PLA-648

Position		Linear Scale	dB(A)
Painter	38	71	65
Console	39	73	62
Console	40	70	60
	41	70	61
	42	71	60
	43	71	62
	44	72	59
	45	71	61
	46	70	65
	47	71	65
	48	70	64
	49	71	65
	50	70	66
	51	72	64
	52	71	64
	53	70	65
	54	71	64
	55	72	66
	56	72	66
	57	72	67
	58	71	65
	59	73	64
	60	74	65
	61	77	65
	62	76	65
	63	75	63
	64	75	64
	65	76	62
	66	76	61
	67	72	58
	68	73	61
	69	70	60
	70	71	61
	71	71	62
	72	72	63
	73	70	63
	74	71	65
	75	72	61
	76	70	62

Position	Linear Scale	dB(A)
77	72	63
78	72	62
79	70	61
80	71	63